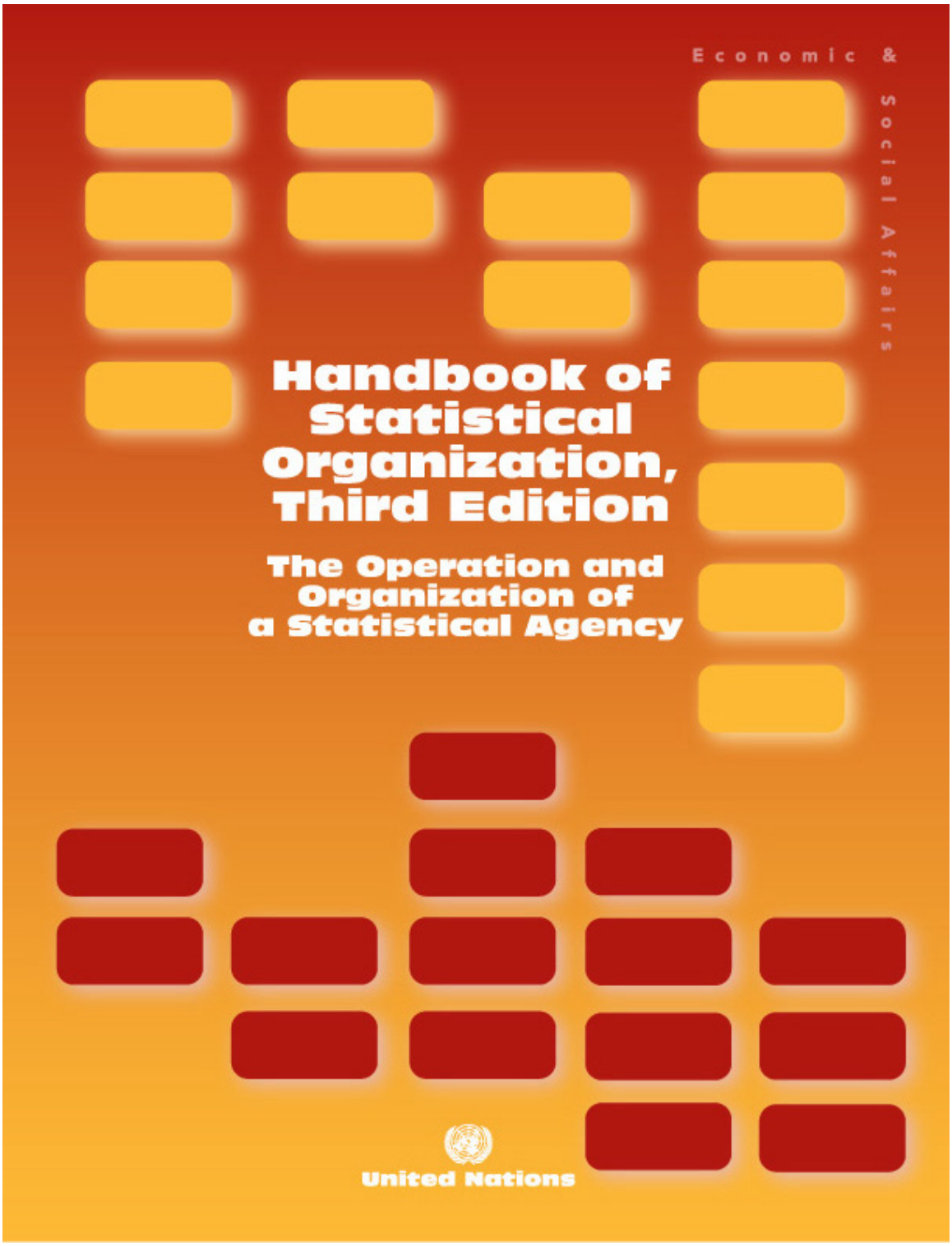
Economic & Social Affairs
Handbook of Statistical Organization, Third Edition
The Operation and Organization of a Statistical Agency
United Nations

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Handbook of Statistical Organization, Third Edition

The Operation and Organization of a Statistical Agency

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NOTE

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

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Foreword

The first Interregional Seminar on Statistical Organization, sponsored by the United Nations, was held in Ottawa in 1952. Two years later, in 1954, the United Nations published the *Handbook of Statistical Organization.* In Ottawa in 1973, a second seminar met on the same theme. By 1980, a second edition of the *Handbook* was ready, which was published under the title, *Handbook of Statistical Organization: A Study on the Organization of National Statistical Services and Related Management Issues.* Nearly two decades later, at a 1999 data quality seminar co-sponsored by the International Monetary Fund and the United Nations, several countries requested an updated version of the 1980 *Handbook*. In response to this request, the United Nations has prepared the present volume, *Handbook of Statistical Organization, Third Edition: The Operation and Organization of a Statistical Agency.*

The third edition of the *Handbook* is largely based on a document prepared by Jacob Ryten under a consulting arrangement with the Statistics Division, Department of Economic and Social Affairs of the United Nations. Staff in the Statistics Division as well as an editorial team representing countries from each of the United Nations regional commissions and the International Monetary Fund carried out the initial review of the document. Subsequently, individual chapters were presented at various seminars conducted by the Statistics Division.

It is important to point out that implementation of the measures proposed in the present *Handbook* may proceed in one of two quite different directions. On the one hand, the measures advocated here should not be adopted one at a time; rather, they should be adopted as a package since they act in concert with one another. On the other hand, it must also be recognized that most agencies desiring to implement the principles in this *Handbook* will not be in a position to implement them all at once. In fact, the most sensible course of action for a country may be to concentrate on just one area, such as managing the core functions of a statistical Office. In any event, each statistical office must decide for itself - given its situation and that of its country - which of the principles advocated in the present edition of the *Handbook* apply.

Once again, without the contribution by Jacob Ryten of the complete first draft, the present volume could not have been written. His work represents a Herculean effort that can be fully appreciated only by those who have attempted projects of this complexity. The draft was reviewed by an editorial board composed of Paul Cheung, Miguel Cervera, Svein Longva, Guest Charumbira, Hasan Abu Libdeh and Carol Carson, who made numerous suggestions for improvements. Suggestions from Jason Brody helped make the text more accessible to readers. Several Statistics Division staff contributed to the final draft, but three deserve special mention: Angela Me, who organized the production of early drafts and in addition made many valuable substantive suggestions at all stages of the process; and Sabine Warschburger and Isabela Heng, who organized and produced the final draft. Chapter VII, “Managing information technology”, is substantially the work of Jack Arthur. However, responsibility for the

final version of the present handbook and for any errors or omissions rests with Hermann Habermann and Willem de Vries, who made the final decisions on its contents and structure.

Nitin Desai
Under-Secretary-General
Department of Economic and Social Affairs

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ABS	Australian Bureau of Statistics
CPI	consumer price index
GDP	gross domestic product
IT	information technology
OECD	Organisation for Economic Co-operation and Development
SNA	System of National Accounts

Introduction

The two main intended audiences for the *Handbook of Statistical Organization, Third Edition: The Operation and Organization of a Statistical Agency* are: (a) the chief statistician (or soon to be chief statistician of a statistical agency) and his or her colleagues; and (b) those charged with oversight of the official statistics function.

As the heads of agencies, those who hold these positions are both formally and emotionally committed to continuity of a tradition embodied by the Fundamental Principles of Official Statistics[1]. In their roles, they establish public faith in the facts turned out by the agency; drive innovation in their agency; foster an ethos of professionalism without which quality standards cannot be maintained; and communicate with both the Government and the public at large regarding the condition of their country on the basis of those aspects amenable to quantitative measurement. The *Handbook,* then, is designed for those who are responsible for providing leadership to a statistical agency and for preserving the public trust. In addition, the *Handbook* may be useful to those who simply wish to understand why a statistical agency operates in the manner that it does.

The *Handbook* is about national statistical offices: government departments of varying status, created in order to compile, interpret and make public official statistics. Such offices come in all sizes and many different shapes. Some are general in the sense that they compile statistics on all that must be known about economic and social processes in a country. Others are very specialized: they compile statistics only on transport, banking or agriculture. Some have high visibility and have their identity sharply defined by statute. Others are nested within other organizations and were created chiefly to inform the governing body of the parent organization. However, except in size, scale of operations and scope, statistical offices do not differ that much from each other in terms of their main function and expected behaviour, nor in terms of the rules that apply to them. They all process raw data, convert them into statistics, apply objective standards to their operations and make it a condition of survival to be impartial, neutral and objective.

The third edition of the *Handbook* is organized into the following areas: general principles for a statistical agency and system, data collection and respondent policies, user needs, principles and examples of organization and management, and dissemination guidelines.

The *Handbook* is not supposed to be read as a narrative story. Rather, it is designed to serve as a checklist of items a successful statistical agency must take into consideration; a set of examples that illustrates how principles can be put into practice in certain typical contexts; a list of factors that may persuade an agency's staff to favour one

[1] *Official Records of the Economic and Social Council, 1994, Supplement No. 9* (E/1994/29), chap. V.

application over another; and finally as a caution that while certain solutions maybe be preferred, none are universal. In particular it must be understood that although the *Handbook* provides clear and firm guidance in these areas, the situation in each country is unique, and only those in the country can determine the usefulness of the guidance offered here. For this reason, the present edition cannot be prescriptive in a generic form. However, it can be illustrative by mentioning examples and suggesting ways of learning from them, and it can lay out a small number of general principles that appear to have withstood the tests of time and location, tradition and legal context, politics and economic development, and needs and expectations. If the *Handbook* succeeds in doing that much, its objectives will be met.

Its flexibility notwithstanding, the third edition of the *Handbook*, like its predecessors,[2] is uncompromising in certain respects. It enjoins the chief statistician and staff to allow no interference by interested parties in the way facts are assembled and combined into statistics, nor in the method and timing of their release to the public. It underscores repeatedly the requirement that the information that statistical agencies collect should remain confidential and inviolate. The failure to treat individual information as a trust would prevent the statistical agency from functioning effectively.

A new generation, with capabilities and resources heretofore unmatched, finds itself with the responsibility of heading today's statistical offices. In fulfilling its responsibility, it may be aided by records of past practices, especially those that yielded favourable results. However, the environment in which official statistics are created and released has changed, and continues to change so profoundly that past experience is only partly applicable. Some of the changes are technology-driven and proceed at an incredible pace. Others are the consequence of social, legal and institutional innovations. Still others result from greater affluence, better education and more sophisticated use of knowledge than ever before.

Never has so much been expected from statistics; never have statisticians had such means at their disposal; and never has there been so much willingness to learn from each other and standardize internationally the outcomes of that learning. This does not imply that these gains are distributed evenly or in the best possible way, nor does it suggest that there are no tensions or even crises. Some difficulties undoubtedly exist. In some instances, the strong nexus that used to bind Governments to their statistical agencies has been shaken and is more fragile today than it was in the past. Some agencies may look back on their individual performance and feel that it has not reflected the technological and economic changes referred to above.

Previously, official statistics were supplied mainly to ministries of industry and finance; to planning commissions and to ministries of trade; and to the most traditional users, the ministries of agriculture, transportation and labour. Today the body of users has

[2] *Handbook of Statistical Organization*, Studies in Methods Series F, No. 6 (United Nations publication, Sales No. 54.XVII.7); and *Handbook of Statistical Organization: A Study on the Organization of National Statistical Services and Related Management Issues*, Studies in Methods Series F, No. 28 (United Nations publication, Sales No. E.79.XVII.7) . Henceforth referred to as "the 1954 *Handbook*" and the "1980 *Handbook*" respectively.

expanded to include departments that look after the natural environment, housing, welfare, education, health, justice and energy. In addition, official statistics are now used by large businesses on a scale commensurate with that of Government and by the general public as well (for example, in measuring government accountability).

The drive to make inter-country comparisons is far more widespread than it was when the 1954 *Handbook* was drafted. At that time, standards taken for granted today, such as the activity, commodity and occupation classifications, were still in their infancy and in any case were literally handed down to national statistical offices by a tiny handful of international experts; in contrast, the participation of agencies in the drafting of today's successors to these standards has become universal. Fifty years ago the domain of international standard-setting was left to international statistical offices. Today, it is a matter that engages all statistical agencies.

The above features then, largely prompted by developments outside the province of statisticians, have made it necessary to update old standards while at the same time paying attention to the past experiences of statistical offices. Indeed, among the many difficulties that statisticians must take into account, perhaps the most noteworthy is the management of an organization that thrives on continuity but must develop in an environment marked by constant change.

The present revision of the *Handbook*, introduces the following principal innovations:

- Greater attention is paid to the statistical process as a process and as a system, rather than as a number of separate institutions linked by coordinating devices. Accordingly, the debate between centralization and decentralization that was heavily featured in the 1980 *Handbook* is now incorporated into an overview of the methods available to strengthen coordination.

- It is recognized that, while access to up-to-date computer equipment and the availability of computer-literate staff have increased greatly in the last twenty years, the management of information technology is a critical issue deserving special attention.

- Planning systems for large statistical undertakings such as censuses are now better understood and more easily put into practice, and are therefore no longer in need of detailed examination.

- The emphasis on the relationships between statistical offices, respondents and users that emerged in the 1980 *Handbook* occupies a prominent place in the present edition. Greater emphasis is also placed on the coordinating power of such elements of the statistical infrastructure as common classifications, the system of economic accounts and other integrating tools.

- The third edition of the *Handbook*, unlike its predecessors, attempts to deal with the concerns of the different classes of users and the statistics they will require as a result of their differences.

Ultimately, the successful statistical agency recognizes that ideal solutions are elusive and that practical, robust and workable solutions are created when the advantages and disadvantages of each approach are kept in balance. Virtually every chapter that follows illustrates such balances. Of course, these cannot be universal, because the way in which various factors are weighed against one another towards workable ends differs according to location and time. It is up to each agency to gauge its particular set of circumstances sensibly.

The successful statistical agency also recognizes that measures are not to be adopted one at a time but rather in concert. Even if initiatives are first evaluated on their individual merits, they must eventually be judged in relation to other organizational and procedural measures.

I. THE FOUNDATION OF A STATISTICAL AGENCY

1. National statistical offices exist to provide information to the general public, Government and the business community in the economic, demographic, social and environmental fields. This information is essential for development in these areas and for mutual knowledge and trade among the States and peoples of the world.

2. The quality of official statistics depends largely on the cooperation of citizens, enterprises and other respondents in providing appropriate and reliable data to statistical agencies.

3. In order for the public to trust official statistics, a statistical agency must have a set of fundamental values and principles that earn the respect of the public. These include independence, relevance and credibility as well as respect for the rights of respondents.

4. These principles are codified in the Fundamental Principles of Official Statistics. [3]

A. Independence[4]

5. A widely acknowledged position of independence is necessary for a statistical agency to have credibility and to carry out its function to provide an unhindered flow of useful, high-quality information for the public and policy makers. Without the credibility that comes from a strong degree of independence, users may lose trust in the accuracy and objectivity of agency data, and data providers may become less willing to cooperate with agency requests.

6. In essence, a statistical agency should be distinct from those parts of the Government that carry out enforcement and policy-making activities. It should be impartial and avoid even the appearance that its collection, analysis and reporting processes might be manipulated for political purposes or that individually identifiable data might be turned over for administrative, regulatory or enforcement purposes.

7. The characteristics related to independence include the following:

- Authority for professional decisions over the scope, content, and frequency of data compiled, analysed or published;

[3] See *Official Records of the Economic and Social Council, 1994, Supplement No.* 9 (E/1994/29), chap. V. Additional information is available in annex II or from http://www.un.org/Depts/unsd/statcom/1994docs/e1994.htm.

[4] Paragraphs 5-8 are based on Margaret E. Martin, Miron L. Straf and Constance F. Citro, Eds., *Principles and Practices for a Federal Statistical Agency: Second Edition* (Washington, D.C., National Academy Press, 2001).

- Authority for selection and promotion of professional, technical and operational staff;

- Recognition by policy officials outside the statistical agency of its authority to release statistical information without prior clearance;

- Authority for the chief statistician and qualified staff to speak about the agency's statistics before the Government and public bodies;

- Adherence to predetermined schedules in public release of important economic or other indicator data to prevent even the appearance of manipulation of release dates for political purposes;

- Maintenance of a clear distinction between the release of statistical information and policy interpretations of such information by the senior members of the Government;

- Dissemination policies that foster regular, frequent release of major findings from an agency's statistical programmes to the public via the media, the Internet and other means.

8. In 2000, the National Research Council in writing *Principles and Practices for a Federal Statistical Agency: Second Edition,* recognized the following as fundamental goals of a statistical system:

- Protect confidentiality of responses;

- Minimize the burden on the people who provide the responses;

- Ensure accuracy, which requires proper concern for consistency across geographical areas and across time, as well as statistical measures of errors in the data;

- Ensure timeliness, which requires concern for issuing data as frequently as needed to reflect important changes in what is being studied, as well as disseminating data as soon as practicable after they are collected;

- Ensure relevance, which requires concern for improving data that help users meet their current needs for decision-making and analysis, as well as anticipating future data needs;

- Establish credibility, which requires concern for both the reality and appearance of impartiality, and of independence from political control.

9. For a statistical agency to operate from a strong position of independence, it is necessary to know how its objectives and priorities are fixed. In fact, its objectives are

fixed by law,[5] and its priorities must be decided by the chief statistician. The objectives are often seemingly very simple. For example, the law governing the statistical agency of Canada states that there shall be a bureau, and that its duties shall be to collect, abstract, compile and publish statistical information relative to the commercial, industrial, social, economic and general activities and condition of the people.[6] However, in a 1989 strategic overview, the chief statistician of Canada stated that the agency's medium-term priorities were, inter alia, provincial statistics, the service sector and science and technology. The law describes the agency's accountability; the strategic overview is the chief statistician's best interpretation of what the agency should do in the medium-term in the light of the perceived demand and the conditions necessary to meet it.

10. A statistical agency is a service agency, so its independence is related to its methods and results, not to its objectives. For this reason, the overview of organizational matters begins with the topic of relevance.[7] There is no question that the products of a statistical agency must be national in scope - that is to say, they must apply to all sectors of a nation's society and economy. However, what does "relevance" mean? What are the constraints, both physical and psychological, that limit any attempt to be relevant?

B. Relevance

11. Statistical agencies should continually seek to improve their data systems in order to provide information that is accurate, timely and relevant for changing public policy needs. One problem with this, however, is that policy interests may change at a faster pace than a statistical system can accommodate. It takes little time for a concern to emerge; first as an item of curiosity, next as a subject of discussion and lastly as a matter of substantial importance to policy makers. For example, the question of the existence of a "new economy", not accounted for by conventional statisticians, first surfaced in the early 1990s in the press and in popular literature. Within two or three years, this issue had become a political priority in a number of advanced countries, and eventually called into question whether statisticians had correctly measured the gross domestic product (GDP) of their respective countries. If this concern had justified the creation of a new research programme, leading to the possible replacement of the current system of economic accounts and basic supporting data, it would have taken years if not decades for such a programme to yield useful measurements.

12. Another example concerns the service sector. Although it took only two to three years for the issue of the service sector - its configuration, productivity and quality of jobs - to become a serious political concern, it took over a decade to formulate, accept and institute the basic international classifications required to collect service sector data.

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[5] See chap. II, sect. E for a more extensive explanation of statistical law.

[6] Government of Canada, *Statistics Act of 1918*. Today's formula does not differ. In the United Kingdom of Great Britain and Northern Ireland, the functions of the office, as identified in *Framework Document: Office for National* Statistics (London, 1996), include the collection of economic and social statistics. Several countries, including Australia, Israel, New Zealand, Pakistan and South Africa have similar broad formulations of the scope of the office.

[7] Some authors believe the term "relevance" is misplaced because it is obvious. They would prefer if the matter of relevance were discussed under the heading "priorities".

Indeed, as late as the end of the 1990s, most statistical agencies were still experimenting with operational frameworks that would enable them to deal in a meaningful way with the service sector.

13. From these two examples it follows that recognizing a problem takes far less time than deploying the necessary means to measure its extent or making the measurement internationally comparable. Given this disparity, a statistical agency striving to be instantly relevant could become systematically irrelevant in the face of rapidly shifting priorities.

14. For the statistical agency, there is little point in attempting to deal with concerns perceived as transient. By the time a programme devised to deal with them is implemented, the policy agenda will have changed several times over. In fact, when examining priority options, the statistical agency will have to sort out the transient from the more permanent concerns.

15. Once a priority is determined, it is difficult for a statistical agency to modify it as fast as policy concerns appear to change. This is why it is crucial to exercise good judgement in setting priorities and to foresee accurately changes in policy direction. The chief statistician's planning involves four important elements:

- Devising programmes that are sufficiently general to adapt easily to small changes in policy direction;

- Building up a reserve of capacity and creating a state of preparedness such that unforeseen contingencies can be addressed without disturbing the regular functioning of the statistical agency;[8]

- Developing human resource policies designed to make the staff of statistical agencies adaptable and redeployable so as to meet effectively changes in agency programmes;

- Sharing technical information and ideas with other statistical agencies. Such sharing can stimulate the development of innovative data collection, analysis and dissemination methods.

16. Ensuring these capabilities gives the statistical agency a great amount of leverage in its attempt to adapt to problems arising from shifts in priorities.

17. In an environment of social turbulence, if it is necessary to answer to a Government using statistical information for planning and allocating resources, the chief statistician is advised to remain flexible. Also, he or she should avoid overly detailed,

[8] The latest experience in a number of statistical agencies was to help determine the preparedness of the business sector to deal with the "millennium bug" in computer systems. Statistics Canada has kept in a state of preparedness a group of survey takers who can deal with a moderately difficult subject in a period of ninety days from start to finish, provided that the number of sampled businesses does not exceed some two thousand.

very specific surveys, keeping in mind that policies may change unexpectedly, limiting the relevance of such surveys. In addition, it is essential to gain advance information on issues troubling policy makers themselves, so that the statistician is aware of impending changes in the priorities of the policy agenda. No matter how small the office, the chief statistician must spend a significant amount of time in the company of senior government officials in order to gain the necessary awareness of impending changes.

18. In addition, it is not sufficient to engage only the head of the agency. Awareness has to extend to the entire agency; for this reason, in the third edition of the *Handbook* a considerable amount of space is devoted to this topic, particularly in chapter III.

C. Credibility

19. A special circumstance affects statistics: the results of the activities of statistical agencies must be replicable to be believable, but realistically the user cannot replicate them. This is why a statistical agency must work hard to bolster credibility, and why there is such extreme sensitivity to any attack on credibility or to notions of a loss of public faith in the reliability of a statistical agency's output.

20. Statistical agencies must be extremely rigorous with respect to the standards that data collection must meet, the methods of processing the data and the derivation of the results. In addition, they must instil in their staff an ethos of quality on a par with such high standards. In this way, the sense that what is produced is the result of quality inputs, as well as quality methods of production and control, is constantly reinforced.[9]

21. The need to inspire an ethos of quality, and to convince all users of the quality of adopted production processes, has a number of organizational consequences. For example, it is reassuring to users if periodically the methods adopted by a statistical agency are subject to an outside process of evaluation and the findings are made public and open to discussion. However, no matter how high a quality involved in the compilation of the national accounts, there is an inevitable residue of estimation based on assumptions that may be plausible but are not necessarily backed by evidence. Conveying this bald fact to the public may give an impression of arbitrariness that in turn could bring the rest of the structure into disrepute. Any sophisticated analyst would know the limits to the effects of these assumptions in the light of the system of identities imposed by the accounting framework. How to convey this to the public in a manner that is not harmful is a matter for careful thought above all in an environment where open inspection of methods is actively encouraged.

22. The underlying issue in the discussion of credibility is how one part of the statistical system can obtain information from a part preceding it in the production chain with complete faith that quality has not been compromised in the process. To make certain that quality is preserved, a subtle combination of subjective elements must be in place. The spirit of quality shared by the staff of the agency must never falter, and

[9] Some statistical agencies (for example, the Australian Bureau of Statistics, Statistics Canada and Statistics New Zealand) go so far as to place their quality guidelines on their web site or Intranet.

methods of inspection and control - of checks and balances - that are powerful enough to detect, correct and prevent future avoidable errors must always be exercised.

23. Credibility is enhanced when statisticians interact in a manner to ensure that respondents provide the best possible answers to the questions that statistical agencies put to them. "Best possible" means that the required information should be made available to the official statistical agency, without distortion caused by respondents' fear of subsequent use or by their failure to comprehend survey questions and without reluctance arising from the agency's perceived disrespect for the respondents' time and privacy.

D. Respondent policy

24. The objectives highlighted in the above paragraphs are easier to state than to achieve, and no single method exists to achieve them. All methods tried so far rely on a combination of four basic elements: legal instruments to force compliance or discourage disobedience; appeals to respondents' sense of morality to encourage cooperation; assurances that the information will not be misused; and increasingly in some countries, a variety of incentives are being used.

25. The confidentiality of individual information is probably the greatest concern among respondents. Agencies that have not yet managed to persuade respondents that the information provided to a statistical agency is absolutely confidential cannot rely on the quality of the information they collect.

26. The power given to statistical agencies by law to solicit information is of little use unless all sectors of society are willing to cooperate. Those offices that have made a strenuous effort to convince respondents that the information they provide is valuable and that the time taken to provide statistical information is respected and appreciated, tend to be the ones with the highest response rates. It should be clear that low response rates are as much of a flaw in statistical work as is carelessness in the editing and dissemination of data.

27. Persuading respondents to part with information is a difficult task (see chapter 12 for a detailed presentation of this matter). Nevertheless, success in this endeavour may have a high rate of return in improving overall quality. In this connection, the national statistical office should be aware of the relationship between the marginal additional expense of improving cooperation and its impact on the overall quality of the resulting statistics. However, other factors must also be taken into consideration. For example, the rate of return on the marginal expense of improving editing might be higher than that of improving response rates.[10]

28. All offices must have a unit dedicated to interacting with respondents. That unit may be part of the office's field organization, or the matter may be of sufficient importance to justify a higher profile unit dealing exclusively with the matter of respondent policies. The objectives of a respondent policy unit are to help raise response

[10] See I.P. Fellegi and A.B. Sunter, "Balance between different sources of survey errors", in *Bulletin of the International Statistical Institute*, Proceedings of the Thirty-ninth Session of the ISI (Vienna, 1973).

rates and ensure that respondents provide information willingly. The staff of the unit must be equipped to answer questions about the use of the information, the care with which it is handled and the general attitude of their agency. They must avoid the appearance of harassment and of heavy-handedness in quoting from the law, and must be fair and consistent in the way they treat businesses and households. If there is a perceived crisis in relations with respondents, the chief statistician is advised to address the matter at his level by placing in charge someone who has his trust and who reports to as high a level in the organization as possible. Reporting directly to the chief statistician at this level may be a good way to show reluctant respondents the seriousness with which the agency views the matter.

Conclusions

Statistical agencies are service organizations. Their reason for existing, growing and making a visible contribution to the affairs of their Government and society is rooted in their capacity to provide information for the solution of important issues. However, priorities can change more rapidly than the agency's capacity to modify its productive effort. For this reason, it is important for its senior officers to have the insight and contacts that allow them to detect serious problems and distinguish them from what may turn out to be no more than a passing fashion.

A strong position of independence is essential for a statistical organization in order to establish credibility among its users and create a relationship of mutual respect and trust. Collecting, analysing and disseminating statistical information should always be distinct from policy-making activities. The chief statistician should commit to impartiality when dealing with the collection and release of information.

A statistical organization must ensure the soundness of the statistical collection and compilation process, and its internal operations. For this soundness to be acceptable to the public, and inspiring to the staff of a statistical agency, a number of conditions must be met:

- The process must be logically sound;
- The machinery that produces it must be robust;
- The descriptions of the machinery and the process must be open for inspection and the result of inspection amenable to public debate;
- Both the process and the machinery must have the capacity to grow and adapt to new circumstances and a new environment.

Unless a statistical agency is able to ensure that the information provided to it by respondents is absolutely confidential, it will not be able to rely on the quality of information it collects, and the credibility of the agency will be in danger.

II. THE STATISTICAL SYSTEM

29. In considering the organization of a statistical system, a number of questions arise: What is the statistical system? Who is at its head? What is the legal basis of the system? Who makes sure that the head of the system does the right thing? Who pays for the operation of the system? Chapter II examines alternative institutional arrangements, but as an indication of possibilities rather than as recommendations. Clearly, institutional arrangements are divided into those that have worked well and those that have not, yet the relative importance of the factors is country-specific.

30. While appropriate organization of the national statistical service is necessary to achieve efficiency and effectiveness, other factors also contribute to its performance. Often, it is believed that problems of statistical policy can be solved by organizational rearrangements, when in reality their solution requires other means, such as capable and inspiring leadership, qualified staff, application of appropriate methods and techniques, and common sense and hard work. Consequently, reorganizational needs should be identified and satisfied but as a means to improve statistics, reorganization should not be overrated.

31. Nowhere in the world has a country vested in a single institution the responsibility to collect all the official statistics of a nation. Rather, statistical systems exist on a continuum. At one end of the continuum stand those nations in which a single institution is responsible for most of the official statistics. Examples include Australia, Canada and Mexico. However, even on this end of the continuum the collection of some official statistics is the responsibility of others. These may be agricultural, labour or environmental statistics, or statistical information based on taxes or civil registration and vital statistics. The country most representative of the other end of the continuum is probably the United States of America, which has numerous statistical agencies that are, for the most part, devoted to particular subject matters. A reference to a "centralized" or "decentralized" system generally indicates a system that is nearer one end of the continuum.

32. Section A below presents a detailed analysis of the different types of statistical systems. It is addressed primarily to those who are still working through problems of status, organization and the relationship of their agency to the rest of the Government.

A. Structure of the statistical system

1. Single institutions

33. The first version of the *Handbook of Statistical Organization*, published in 1954, describes the single institution as one type of statistical system:

> "…A system of this nature is typified by the establishment of one department within the Government to organize and operate a scheme of coordinated social and economic[11] statistics pertaining to the whole country. This department collects, compiles and publishes statistical information …and, in addition, collaborates with other departments of Government in the compilation of administrative and specialized statistics".[12]

34. The advantages the 1954 *Handbook* cites for this form of organization include the following:

- Concentration of specialized and scarce manpower in one centre;
- Coordination of programmes within one office;
- Concentration of scarce equipment and know-how to operate it;
- Easy recognition of the institution in order to guarantee quality, impartiality and freedom from political interference.

35. A more general formulation of this kind of system is given in the 1980 *Handbook*:

> "…A national statistical service is centralized if the management and operations of the statistical programmes are predominantly the responsibility of a single autonomous government agency, headed by the country's chief statistician. Centralization can include outposting of staff to other departments or the delegation of certain functions to geographically separate units, which, however, remain subordinate to the central authority". [13]

36. In addition to the advantages listed above, the 1980 *Handbook* notes that it is also convenient and efficient for users to secure statistical materials in a variety of fields from a single source, and that respondents to censuses and surveys find it convenient to deal with a single office, especially if they suspect duplication. The text indicates that a centralized organizational arrangement makes it easier to create the customized tabulations and cross-cutting arrays of data sometimes necessitated by user concerns. The text adds that protection of "incoming" confidentiality as well as "outgoing"

[11] Today, statisticians would add the words "and environmental" to bring this description up to date.
[12] *Handbook of Statistical Organization*, Studies in Methods Series F, No. 6 (United Nations publication, Sales No. 54.XVII.7), p. 11.
[13] *Handbook of Statistical Organization: A Study on the Organization of National Statistical Services and Related Management Issues*, Studies in Methods Series F, No. 28 (United Nations publication, Sales No. E.79.XVII.17), pp. 14 ff.

confidentiality is easier and more credible if conducted by a single agency rather than by several. Finally the text concludes that it should be easier for such an office to maintain balance in the priorities assigned to different statistical fields, that is, to coordinate the entire service. The subsequent commentary stresses the need for an integrated system of social and economic statistics; assuming that both systems have sufficient funding and capable leadership, this is more easily achieved if the coordination problems are internal rather than external.

37. Clearly, the circumstances that exist today are not the ones that existed when the 1980 *Handbook* was developed. Some changes since then relate to the following:

- The availability of computing and printing equipment at relatively low cost and the wide diffusion of the necessary know-how to operate it;

- Easier access to mathematical/statistical techniques and their availability in pre-packaged computer programs for easier application to problems of estimation and formal data analysis;

- The introduction of advanced quantitative methods in the teaching of the social sciences;

- The globalization of curricula;

- The advent of universal telecommunications, including worldwide access to and use of the Internet;

- The sophistication of use and of users has increased noticeably, implying that their demand for integrated statistics has also increased;

- Increased pressure on public sector resources, despite the progressive relative cheapening of computing and data storage facilities;

- Increasingly, a shift of responsibility for some functions[14] once associated exclusively with statistical agencies, centralized or otherwise, to private sector enterprises;

- Greater pressure to produce internationally comparable data, not only within new inter-country arrangements such as the European Union but also because of the greater number of free trade and customs union entities.

38. Despite these changes in the environment, most of the advantages of centralization outlined in the 1980 *Handbook* are still valid.

39. Whether or not these changes, taken together in a national context, suggest the need for a radical change in the institutional arrangements prevalent to date is a question

[14] Examples that have come to light include printing and disseminating; document storage and retrieval; data entry; systems analysis; and collecting consumer prices.

for each government to answer, taking fully into account its own circumstances. However, today's state of affairs seems to bear out the following note of caution sounded in the 1980 *Handbook*:

> " …Amendments in the scope and range of activities within a national statistical service require a specific high-level policy decision by the central Government and may even involve special legislation. Such a decision is not likely to be influenced entirely by the results of an objective analysis of the alternatives. Inevitably, past practices, interdepartmental rivalries, the structure and size of Government, the impact of tradition and personalities, and so on come into play. Moreover, when possible changes in the organization of a national statistical service are considered, short-run disruptions in service that may be induced by the change must be weighed against the long-run gains".

2. More than one institution

40. Two advantages are usually mentioned in relation to decentralized systems. The first is that the statistical agency is close, both physically and intellectually, to the subject-matter policy office. In this case it may be more likely that the statistical agency will be responsive to policy needs and be aware of impending requirements. The second concerns the chief statistician. As the present *Handbook* points out, the chief statistician is enormously important in defining the culture of the institution, and in providing intellectual and ethical leadership. In a decentralized system a poor choice for the head of one agency or institution will not directly affect the culture in the other agencies.

41. The first edition of the *Handbook*[15] distinguished three types of decentralized systems:

- A statistical system decentralized by subject with a coordinating authority;
- Statistical systems decentralized by subject with no central control or coordination;
- Statistical systems decentralized by subject with a minimum of control or coordination.

42. The first of these is to be avoided if at all possible. It is usually the product of historical accident and a rapid, disorderly rise in demand for quantitative information by a handful of ministries and other government agencies.

43. Although the second type of system is not mandated by law, it is entirely possibly that it will be able to provide effective coordination in a decentralized system. In contrast, the third system, while operating within an established legal framework, may be ineffectual if de facto coordination is absent owing to indifferent leadership or inter-institutional jealousies and rivalries.

[15] 1954 *Handbook*, pp. 10 ff.

44. The preceding remarks on decentralization relate to institutions outside the central statistical agency that deal with certain subject matter areas. Entirely different is regional decentralization, which may take various forms. This form of decentralization may also imply certain coordination problems. Whether such decentralization is, on balance, efficient and effective depends very much on national circumstances. Often it is a function of either the size of the country or of the government structure, as for example in federal systems.

45. Such decentralization has two basic forms but many national situations are a mix of the two. The first form is comprised of regional statistical offices, sometimes in two hierarchical layers (e.g., regions and districts), but totally controlled by the central statistical office. Such systems are sometimes called "vertical". In this form, the role of the regional offices is usually exclusively data collection as prescribed by the central office. Often, a factor in the creation of such a system is the size of the country, in combination with developing communication systems. Coordination in such systems should proceed smoothly provided the central office has sufficient resources for training regional staff.

46. In some cases, in addition to being responsible for data collection, the regional offices have an important role to play as dissemination centres, as in Canada and France. In the case of Australia, the regional offices act as *national* centres for certain areas of statistics. Thus, the office in Victoria (Melbourne) is responsible for the compilation and dissemination of statistics about the services sector of the entire country.

47. In the other form of regional decentralization, the regional offices are *not* directly or not exclusively controlled by the central office, but are part of the regional administration of the country. Often, this occurs in federal systems of Government. A well-known example is Germany, where cooperation between the Federal Statistical Office and the statistical offices of the state Governments is based largely on a complex system of agreements about data collection, statistical standards and other issues. Switzerland is another example. Coordination in such systems need not be a major problem, but may be rather more difficult to achieve and require more effort than in vertical systems. For example, in Spain each autonomous region has its own statistical office that is maintained by the regional administration. However, the autonomous regions are subdivided into provinces, and the statistical offices at the provincial level are operated by the central system.[16]

[16] In another scenario, the central bank coordinates economic statistics because it compiles the national accounts and provides the means for most innovative statistical activities. However, since the central bank does not have the legitimacy of a central statistical agency when it comes to defining statistical standards, adopting questionnaires and nomenclatures, and conferring internationally with statistical counterparts, its capacity to coordinate is limited. This will be considered further in chap. II, section B.7.

3. Importance of brand-name recognition

> "…A distinction must be made between legal status and status in the sense of an agency's professional and administrative standing in the eyes of other government bodies and the public. It is in fact status in the latter sense that matters most for the external capability of a statistical agency or service".[17]

48. Usually a stand-alone statistical agency is recognized as an identifiable agency within the central Government and its director reports to a minister or the equivalent. Generally the agency occupies its own building, and in the eyes of the public its activities are attributed to the agency itself, rather than associated with the governing ministry or an equivalent governing body. Thus in countries where an institute of statistics compiles the consumer price index (CPI), the public would recognize that the index is compiled by that entity and not, for example, by the ministry of economic affairs.

49. Existing as a recognizable agency within the Government implies budgetary recognition.[18] This means that in the government accounts there will be one line mentioning the institute and its corresponding appropriation. In virtually all countries where the statistical system is of some size and there is a dominant agency, that agency stands alone whether or not it is called an "institute". In smaller countries, however (and in general during the period preceding the Second World War), the examples of directorates or directorates general nested in a ministry are numerous.

Box 1. Brand and no-brand statistics

Recognizing quality in statistics and using them with trust are closely associated with the recognition of the agency that has compiled them. The wider the agency's recognition, the greater the acceptance of the information because of the element of trust. However, to gain the widest possible recognition, the statistical agency must be visible, and its visibility increases if it stands on its own as part of the central Government.

B. Coordination tools

50. Regardless of the location on the continuum of the particular structure of a nation's statistical system, some coordination will be necessary. Coordination is desirable for a variety of reasons, including the following:

- To create a national statistical system in which the outcomes of various data collections are comparable or can at least meaningfully be related to each

[17] 1980 *Handbook, p.* 21.

[18] Some have argued that budgetary recognition is a mixed blessing. At times it protects the statistical system from arbitrary reductions imposed by ministers who may have different ideas about national priorities. However, as a simple directorate, unmentioned in the public accounts, a system may escape excessive reductions at times of major budget cuts.

other, harmonization of concepts, definitions, classifications and sampling frames is necessary;

- To avoid duplication of effort, as well as undue burdening of respondents, agreements about efficient and effective data collection are required, including the use of non-statistical government data files;

- To strengthen the position of and enhance the image of official statistics, coordination of dissemination methods and pricing is very useful;

- To represent a country's interests internationally, coordination of international policies is needed.

51. This section addresses effective coordination tools in both centralized and decentralized systems. These include incentives and deterrents for effective coordination; issues on which coordination is required; and tools that make coordination possible. The information on mechanisms that ensure the spread of information and monitor compliance is applicable more or less to both systems. Some tools specific to decentralized systems are identified, and finally there is an overview of the role of the central bank.

1. Incentives

52. If the various agencies in the system have the distinct view that they are better off by not being part of a coordinated system, it is unlikely that that coordination will succeed no matter how well legislated. Governments are wary of enforcing coordination with severe sanctions, and without these, only incentives are likely to work. With respect to data collection activities, there are in fact objective reasons why a ministry may decide to continue operating its own statistical cell rather than assign the work that it has carried out in the past to the central statistical agency. Those reasons include:

- The view that users' demands can be met accurately and on time only if the work is handled within the ministry;

- The impression that the central statistical agency does not possess the skills and knowledge required, largely because the ministry is in charge of a very specialized area or because its infrastructure is better suited for the particular statistical activity;[19]

- The view that the statistical work of the ministry is an offshoot of its administrative procedures and is therefore handled more efficiently than if taken over by third parties;

- The acknowledgement by the ministry that in any case its legislation prevents the sharing of information with other statistical agencies and that the effort required

[19] This happens very frequently with ministries of agriculture: their concerns are specialized, and they may employ a network of extension agents who have the right training to undertake statistical fieldwork.

to change the law would exceed the benefits derived from transferring or sharing the responsibility.

53. Incentives to encourage agencies to take part in a well-coordinated system could include any of the following:

- Sharing information that would improve the ministry's capacity for statistical response, assuming it has the same attributes (classification, standards, coverage, etc.) as the statistics produced centrally;

- Providing access to statistical expertise that complements the expertise available in the statistical cell in the ministry;

- Providing input in determining priorities in all-purpose statistical initiatives such as the census of population or in relevant classification systems;

- Engaging in joint statistical activities so as to provide leverage for its own budget.

54. Of course, the relative weight of any of these elements will vary over time and according to the individual agency's stance on whether or not the prospects of coordination might be beneficial, given its programme, users and budget. Chances are, it will not be moved by such abstractions as the benefit of an integrated system of social and economic statistics. It may not even be moved by the argument that its credibility with users will rise, as will the receptivity of respondents, once they are aware of the efforts made to avoid duplication and simplify requests. In the majority of situations, such gains will not be immediately evident. However, a clear demonstration by the users of ministry statistics that they feel better off if they are provided with a broader range of data could be the decisive factor.

55. Invariably, coordination results in the loss - real and perceived - of independence by those coordinated. For example, the avoidance of duplication could mean that a particular statistical cell has to rely on the statistical or administrative work of others to find its information. It may find that it is no longer free to adapt standards and nomenclatures to its convenience but has to settle for those adopted by the majority or imposed by the coordinating agency. Nevertheless, sooner or later, the proximity of the cell's practices and results to those of other statistical agencies will lead users to question their consistency, and eventually coordinated answers will be called for.

2. Some useful mechanisms

56. The most frequently seen coordination tools are nomenclatures and some combination of questionnaire and budgetary control. The application of these controls can be formal or informal, depending on tradition and an assessment of the most efficient way to ensure compliance. There may even be a law concerning the details of coordination. Matters are helped if there is a political decision or at least a decision made at the highest level of the civil service that the only legitimate standards of classification are those promulgated by the central statistical agency. In many countries, the statistical

agency will act as a mediator between international organizations and domestic statistical agencies. The international organizations are perceived to have the legitimacy and knowledge required to determine standard classifications.

57. In the case of questionnaires, and even administrative forms that request information to be used for statistical purposes, one way to ensure coordination is to create a logo indicating that the form has been inspected and approved by the relevant central body. It is important that in exercising control, the central statistical agency is seen as a facilitator, not as an impediment to initiatives. This is not easy. An inter-agency commission that approves data collection instruments controls respondents' burden and is not associated with any particular agency but is provided by the central statistical agency and might allow for the perception of the central statistical agency as a coordinating friend rather than as a controlling enemy.

58. In general, coordinating mechanisms tend to be in the form of committees, formal or informal, but in any case sufficiently manageable to meet regularly and reach decisions that the represented parties can put into practice.

59. For the work of these committees to be fruitful, they must have the power to approve forms certifying the use of certain nomenclatures used for statistical purposes; they require support from higher levels in the political hierarchy; and officials in each ministry or agency with a stake in the statistical system must demonstrate that they regard taking part in collective initiatives as a necessary duty.

60. The central statistical agency should remember that its concerns would seldom be the highest priorities for other departments and agencies. Accordingly, it should shoulder the burden of maintaining coordination. So long as it perseveres and takes its responsibilities as coordinator of the system seriously, thoughtfully and in a spirit of cooperation, the central statistical agency can provide cohesion for the system. However, the statistical agency shows either the least bit of impatience or a lack of interest, the other participants may take it as a signal that the coordination effort should be of little consequence to them.

3. National statistical council

61. Coordination may be considerably helped where there is a national statistical council. Countries with no previous experience with such councils but convinced that their existence may be of help should take advantage of any relevant opportunity that offers itself. For example, having a nationally visible, prestigious figure serve as chair on a sustained basis provides an opportunity to launch the council and give it substantive powers. The central statistical agency or the chief statistician should find an *ex-officio* role in the council, thereby strengthening the office's influence in discussions about coordination. The role of the national statistical council will be discussed in detail in chapter II, section D.

4. Coordinating budgets and standards

62. A powerful budgetary tool to ensure coordination is to estimate a budget for total statistical activities and to give the coordinators the power to allocate it, with fairness regarding quality and response burden in mind. A coordinating agency armed with the power to make budgetary allocations will find it a good deal easier to impose standards, although it is clearly in the best interests of users and of the statistical system to integrate, rather than to maintain sets of non-comparable statistics.

63. At any time, a legislator might ask the question, "How much does it cost to produce official statistics in my country"? This can be an ominous question for statisticians. If the answer is not readily available, a Government in the process of making serious cutbacks may choose to allocate a disproportionate share to the central statistical agency, oblivious to the fact that it may carry only a small portion of total statistical activity.

64. In certain countries, the answer is relatively straightforward. The cost for a few specialized activities must be added to the initial budget of the central statistical agency, and the result is the total amount committed to statistics. However, in many other countries the answer is difficult to provide with any degree of certainty. The majority of statistical activities are conducted in other ministries and agencies, and in those cases where they are not explicitly noted in their department's financial statement, there is no reliable way of estimating their expenditures. Often a literal "guess" is required, particularly in cases where statistics are a by-product rather than the focus of a department's work. Since staff members, and particularly professional staff, will be engaged in a variety of overlapping activities, they certainly will not be able to gauge accurately the resources invested in statistics per se. While estimating expenditures gives a rough idea of the relative amount committed to statistics, it is unreliable in discerning year-to-year changes.

5. Placement of staff

65. The tools of coordination mentioned so far exclude coordination through the placement and intermingling of staff. Managing government statisticians is an issue that is relevant in only a few countries. Essentially it entails placing in the hands of a capable authority, the chief statistician being the obvious choice, the power to certify that one is allowed to work in the public sector as a statistician. The system can have additional attributes. For example, the school or institute that trains statisticians may be attached to the statistical agency. If it is highly respected, it may find itself catering to private as well as to public sector needs. In those circumstances, the chief statistician becomes not only the effective head of public sector units conducting statistical work, but head of the statistical profession irrespective of where its members exercise their skills.

66. Where coordination is achieved through staff members that share the same training and professional leadership, many of the coordination tools mentioned above may not be required. If the need for such devices does arise, they are likely to be created more or less spontaneously, without the need for any great formality.

67. A number of agencies have implemented regular exchanges of staff as a means to expose staff members to a broader range of ideas and practices. If the central agency is the interlocutor with other countries' agencies, such exchanges will enhance its prestige and status and serve to foster the ability to coordinate. Even though this is practiced on a small scale, and involves relatively few countries, the idea is praiseworthy, as it strengthens the sense of international community. It can also be used as an incentive by a central statistical agency, particularly in the case of developing countries, if the exchange takes place between the agency and its peers abroad.

6. Coordination tools for a decentralized organization

68. The preceding section presented different types of coordination tools that should be considered when the statistical system is a more centralized one. Clearly, the more decentralized a system the more important coordination becomes. Many of the tools introduced above are also applicable to a decentralized system. However, experience has shown that the most important tools that should be considered are the following:

- The ability to control or at least to significantly influence the budgets of the statistical agencies;

- The ability to control whether or not an agency is allowed to carry out a data collection activity;

- The ability to decide on nomenclatures for the statistical system.

69. These coordinating functions may be executed by a separate body or by one of the several statistical agencies. Even if the above three tools are employed, there is one other important consideration. This has to do with the manner of the application of the tools. More specifically, the application can be done in an informal manner or there may be a formal process. In the first instance, there may be an informal agreement between the statistical agencies and the agency that is doing the coordinating (or a separate coordinating body) to the effect that the coordinating agency will have the authority to apply the above tools. In well-established statistical systems, this informal application can be very powerful indeed. If there is a lengthy tradition behind the agreement, the pressure to continue their use will be very powerful. In new or reasonably new systems, however, this may not be the case, and a more powerful application mechanism may be needed. This is the formal process. A weaker form of the formal approach is for the prime minister or president to issue an order; a stronger approach is through legislative action. While it may be difficult to influence either of these formal mechanisms, once they are in place the responsibilities of the members of the statistical system will be clear. The coordinating agency will also be in a much stronger position to apply these tools.

Box 2. Centralization versus decentralization

Centralization and decentralization are the subject of intensive discussion in the statistical community. Some of the most important issues related to this subject are summarized below:

- The stronger the powers of coordination at the centre of the system, the greater the chance of integrating statistics effectively;
- Integrated statistics (definitionally, conceptually, through the use of harmonized nomenclatures and classification devices) are immensely more powerful than statistics collected without harmonization;
- If the office in charge of coordination is backed by numbers, the legal power to apply the tools of coordination and a healthy budget, its capacity to coordinate is correspondingly greater than that of an office lacking these assets. See chapter II, section B.6 above;
- In a system where the tools discussed in chapter II, section B are lacking, it is vital for the chief coordinator to have the status, access and capacity to offer career opportunities to intelligent, competent and motivated staff;
- Physical proximity to policy analysts in decentralized systems can be important to statisticians in determining policy needs. However, examples exist of centralized systems that have found ways to be responsive to the requirements of policy officials;
- The ability of centralized systems to create convincing career opportunities tends to increase with size. Small statistical institutes with a limited number of professional posts give the impression of limiting career prospects;
- Economies of scale give the chief statistician more flexibility in efficient management of his/her budget;
- Whatever the institutional arrangements, policy analysts and decision makers, particularly in the more specialized activities, must feel they can involve statisticians directly in their quest for more relevant and reliable quantitative information.

Notwithstanding these arguments, the 1980 *Handbook* recognized that the practical issue to address is that of "degree of centralization", about which it says:

> There seems to be a consensus that one of the statistical institutes among the several responsible for the collection and dissemination of statistics, should "…be responsible for population censuses, household surveys, demographic statistics and a wide range of economic statistics involving establishment and enterprise censuses and surveys, as well as prices, international trade, the national accounts and other across-the-board activities. There seems to be less of a consensus in regard to … the social sphere - education, health, crime etc. - where statistics are based to a substantial degree on administrative records collected by other government departments…" [a]
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> [a] *Handbook of Statistical Organization: A Study on the Organization of National Statistical Services and Related Management Issues,* Studies in Methods Series F, No. 29 (United Nations publication, Sales No. E.79.XVII.7).

7. The role of the central bank

70. The Statistical Commission noted at its nineteenth session in 1976:

> "…many developing countries have experienced severe losses of professional staff in their central statistical organizations, thus reducing their contributions to planning and policy formulation processes. Those losses and the generally severe shortages of trained statistical personnel in those countries reflected in large part the disadvantaged position of the statistical services with respect to pay scales and related working conditions". 20

71. This situation has not changed. In fact the disparity in working conditions between statistical agencies and central banks, for example, may be increasing. The present *Handbook* is not the place to lobby for an improvement in working conditions for the staff of statistical agencies. However, many of the remarks about organization included in this book may seem superfluous so long as such serious imbalances persist.

72. Central banks have taken over a number of key statistical activities in countries where, in spite of a long-standing tradition of statistical production, the budget of the central Government is no longer thought sufficient to support it.

73. When the central bank is responsible for macroeconomic statistics and key economic indicators, the bank commissions basic statistics from the statistical agency. In addition, a number of the ministries have their own statistical budgets and use them to compile special performance statistics.

74. Often there is no coordinating mechanism in this type of system; only the standards required by the system of national accounts and by the needs of the economic policy makers. While this situation may not be ideal with respect to the long-term development of the statistical system, it is nonetheless a workable model.

75. Existing imbalances in salary and working conditions between the central bank and the statistical agency may significantly limit the agency's capacity. In the light of such difficulties, it is prudent to recognize the reality of the situation. Even if there are no legal provisions on which to base coordination, the statistical agency should work out a de facto arrangement with the head of the central bank's research department.

C. The chief statistician

> "…The external capability [of a statistical agency] is also much influenced by the status of the head of the statistical service in relation to colleagues in the government hierarchy. There can be no doubt that the building of a robust statistical service is contingent on assigning top people to it. In view of the great national importance of many decisions which may be affected by statistics, it would appear to be in the national interest for the statistical service to have an equal opportunity to compete with other government departments for an outstanding individual of proven capability to be its leader and manager…He or she should be in a position to develop rapport with policy advisers of other government departments and to negotiate various proposals

[20] *Official records of the Economic and Social Council, 1976, Supplement No. 2* (E/5910), para. 138.

> on statistics with authority and insight…He should have the same status as the top civil servant of a ministry".[21]

76. If there is an agency that can be called the central statistical agency, it is the head of that agency that is referred to here as the chief statistician. The chief statistician should be the highest authority in the government statistical system with respect to substantive statistical matters.

77. Not all national statistical systems have an obvious chief statistician.[22] This section considers the matter of status; the practices governing appointment and resignation; matters of authority and competence; and the underlying issue of qualifications.

1. The chief statistician's superiors

78. The terms of reporting vary a great deal. By and large, in situations where the statistical agency is an independent agency, the head reports to a minister. However, the terms of reporting vary considerably between countries. In some cases, the minister is responsible for the appointment and dismissal of or for requesting the resignation of the chief statistician. In other cases, the chief statistician is appointed by the parliament and it is the parliament that delegates its supervisory functions to one of its members, normally the minister to whom the responsibility for the central statistical agency is assigned.[23]

79. More crucial than the chief statistician's formal superior is the official with whom the chief statistician interacts on a day-to-day basis or on key occasions. For example, some statistical agencies are located in the prime minister's office, but it does not follow that the chief statistician interacts regularly with the prime minister. In fact, owing to the prime minister's other concerns, the chief statistician may find that his/her regular liaison is of much lower rank than if the statistical agency were placed under the supervision of another minister.

80. A question arises relating to the selection of the minister to be placed in charge of the statistical agency (and with what power). The trade-off is easy enough to understand. The more powerful the cabinet position of the minister in charge, the more the status of that position reflects in principle on the chief statistician. Other things being equal, more status accrues to the chief statistician if he reports directly to the minister of finance than, for example, to the minister of communications.

81. The matter of reporting to a minister and the coherence between the minister's portfolio and the service provided by the statistical agency have to be viewed from the proper perspective. A relationship between chief statistician and an elected politician is required because the former must be accountable and take political guidance. Neither of

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[21] 1980 *Handbook*, p. 21.

[22] In fact, even when the system is centralized, it may be difficult to ascertain who the chief statistician is because of the existence of coordinating boards.

[23] The designation "minister" is shorthand for a variety of cabinet officers. In certain cases it is the head of Government who retains responsibility for the statistical agency. In some countries of Latin America, it is the vice-president.

these constraints implies a loss of independence in the sense that in the end, it is the chief statistician who decides on the methods, the results and their presentation.

82. Different benefits and drawbacks arise from the relationship between the chief statistician and his/her superior, depending on the amount of influence (not personal, but rather formal) the minister possesses. A highly influential minister would have more of a hand in determining budgetary allocations. However, it is possible to imagine a situation in which public credibility might be challenged (how would an important minister such as the minister of economic affairs resist the temptation of putting pressure on the chief statistician to get more acceptable results for the Government or a political party), and the many claims on the minister's time could heavily affect his/her sense of priorities so that his/her interest in the statistical budget might be minimal. Conversely, a less influential minister in charge of a more neutral and less demanding portfolio, or even a cabinet member without portfolio might preserve credibility and prove to have more time and interest, but have less influence on the outcome of budgetary allocations.

83. In many developing countries, a longstanding relationship had existed between the planning body and the statistical agency. The planning body by its nature had extended its interest to virtually the entire output of the statistical agency and therefore was in a position to articulate its priorities in a balanced way. As ministries of planning have changed functions, been retired, or simply renamed, the links forged have tended to be transferred to the economic portfolios that took over from the planning body.

2. The chief statistician's colleagues

84. Perhaps the most important advantage of high status is that it affords the chief statistician greater access to key people in Government as well as to others who influence public opinion and the economy. The critical definition is that of "user", which extends all the way from the senior official who proposes quantitative criteria for an assessment of the performance of the country's health system to the junior professional who writes a paragraph on what the latest indicator of industrial production appears to suggest. In the structure of the statistical system, access to the latter may be useful, but access to the former is essential for the preservation of the agency's claim to relevance.

85. Accordingly, the chief statistician must have easy access to the highest official (the minister or, in many instances, someone just below the minister) in each of the major user departments. Such access, provided it is frequent and sustained, allows a chief statistician to make informed decisions about priorities and internal allocations of resources. Without it, the valuable insights required for successful decision-making may be absent, particularly during times of shifting priorities.

86. The chief statistician must preserve a delicate relationship, not only with potential users, but also with the suppliers of information contained in administrative records, for their degree of responsiveness has substantial effects on the success of a statistical program. Interaction with senior officials responsible for such activities as taxation, customs administration and social security is fundamentally different from interaction with potential users. With users, the chief statistician inquires into concerns, priorities

and trends, with the specific objective of providing a service. With suppliers of information, the chief statistician is vitally dependent on the goodwill of his/her counterparts, but can give little in return; hence the importance of high status with strong political support.

87. If the chief statistician is also the chief coordinator of the statistical system, his/her status must give him/her access to the principals of departments containing statistical cells, and his work must include regular meetings with the managers of those cells.

88. In the case of federations, if the statistical system is to have a truly national character the chief statistician must have frequent, unfettered access to the relevant authorities in the federated entities and be recognized as the chief statistician or at least the primus inter pares by his/her regional peers.

89. Finally the chief statistician must also maintain a rapport with peers abroad. Heads of statistical agencies, particularly the smaller ones, who cannot maintain a body of expert economists, sociologists and demographers should consult their peers frequently and informally about problems they share, and judge whether tested solutions abroad could be implemented at home. Once a fraternal atmosphere is created and maintained, these judgements can be made more easily. Maintaining these relationships has become incomparably easier with the relative reduction in telecommunication costs and, above all, with the advent of the Internet. If new chief statisticians do not inherit this invaluable resource from their predecessors, it should be acquired immediately and fostered.

3. Qualifications of the chief statistician

90. In order to select the best qualified individual for this position three issues must be addressed: Who should the chief statistician be? Who should make the appointment? How should the appointment process be conducted?

91. There are several attributes a chief statistician should possess. First, he/she should be a statistician - someone proficient in statistics, or someone with a profound understanding of statistics. Second, the chief statistician should be capable of running a large professional organization; and third, this person should understand and be sensitive to the wishes of users whose needs are likely to have a profound influence on the activities of the agency.

92. These attributes are seldom found with equal weight in one single person. Some chief statisticians are distinguished professionals (statisticians, quantitative economists, demographers, etc.) who bring to their post the knowledge, prestige and wisdom they have acquired in the course of their careers. Others, preferably with a strong professional bent, have demonstrated excellent managerial instincts by successfully directing public programmes, agencies or private institutions. Still others bring the experience and the contacts that only long years in government can produce.

93. Obviously, the nominating authority will seek to maximize all three attributes, but it may have to make a choice at a very early stage. It may decide to select a chief statistician from within the statistical agency or may prefer to scout the outside world - it may seek the most suitable candidate in academic or research organizations in an attempt to emphasize the professional component of the ideal string of attributes; or it may consider successful programme managers with the right disposition and academic background to assume leadership of a statistical agency.

Box 3. Needed attributes change over time

As the needs of the statistical agency evolve, the weights of the various attributes desired in a chief statistician will vary. Clearly an agency that has run into trouble over personality conflicts or budgetary difficulties, appears to be chronically late with its output, or has an amorphous programme of future activities requires a leader with high-level managerial capacity. An agency that has allowed itself to be placed at the margin of Government concerns or appears to be insensitive to the immediate needs of decision makers might require a leader who knows the ins and outs of Ggovernment. However, once the perceived crisis has subsided, the requirements may change again.

94. A wise nominating authority demands a chief statistician who is highly independent. If it appears that the chief statistician is overly influenced by an interested party in Government, the credibility of key economic indicators, and eventually of the entire statistical programme, is jeopardized.

95. The perception of personal and institutional independence is so important that the process of selection and appointment is given special attention, at least in some countries. For example, in countries that have a thriving professional statistical society, the Government often seeks its advice before making the final choice.

4. Term of office of the chief statistician

96. The term of office of the chief statistician is just as crucial as that of nomination. Three standard situations can be identified:

- The chief statistician's term of office is the same as the executive's (this is the case with the chief statisticians in a number of countries in Latin America);

- The chief statistician is appointed for a term of office that can be renewed[24] (this is the case with the Government Statistician of New Zealand; the Commissioner of the Bureau of Labor Statistics of the United States; and the Director of the Office for National Statistics in the United Kingdom of Great Britain and Northern Ireland. It appears to be an emerging trend;

[24] There are many variations on this practice. Some appointments are limited to one term, with no chance for renewal; in other cases, there may be only one renewal; or there may be as many renewals as the nominating authority sees fit.

- The chief statistician serves an unlimited term, which ends either with his/her resignation or removal from office (this is the case with the Chief Statistician of Canada).

97. The considerations at play are fairly obvious. Short terms of office interfere with continuity; statistical programmes tend to extend over significant periods of time. A series of chief statisticians would not share a common vision and programme commitment, and would therefore be unlikely to produce a consistent approach to statistical policy or predictably adapt to new circumstances. On the other hand, excessively long stays in office may produce stagnant programmes, lacking energy and innovation. While such a situation may keep the statistical agency out of potential conflicts, it may also marginalize the agency and constrain its staff, eventually leading to reduced budgetary support.

98. The above situations represent two extremes. In designing laws or regulations and establishing standard practices, one must guard against the greater of the two evils. One would expect to find in all, or at least in the majority of cases, a provision that authorizes the political official responsible for the statistical agency[25] to request the chief statistician's resignation.

99. Requesting a resignation is less likely to be necessary if the chief statistician serves a limited, rather than an open-ended, term.

100. The existence of an effective national statistics council is helpful particularly in preventing arbitrary appointments and dismissals.

5. Demanding resignation and threatening resignation

101. Responsible ministers will be very reluctant to demand the resignations of chief statisticians for reasons other than clear incompetence. Refusal to disclose confidential information or to obscure or delay the presentation of a key result should never be a reason for such action. Most Governments will understand that credibility is an essential element of a functioning system of official statistics. If, for example, a Government is elected on the basis of its commitment to full employment, and in fact the statistics show strongly decreasing unemployment numbers during its term, these statistics will only be important if there is no doubt about the trustworthiness of the statistical system or its chief statistician. Moreover, the prospect that a chief statistician will publicly resign rather than compromise his/her integrity is a strong deterrent against such a request. Identifying confidential data and modifying data or its presentation are, as mentioned before, examples of such breaches of integrity.

102. Conversely, a chief statistician should not use his letter of resignation as a bargaining tool, except when the integrity of the office is threatened.

[25] In certain countries this could be parliament. In others, it could be the prime minister, the minister responsible, or even the top civil servant acting with the delegated authority of a higher-level official.

6. The authority of the chief statistician

103. So far the present chapter has examined the chief statistician's surroundings – who is responsible for the appointment, from who he/she takes orders and those with whom he/she associates. The next issue of concern is the authority of the chief statistician.

104. There are operative failures that the user community should not accept from any chief statistician. For example, it would be unacceptable to publish the CPI two months after the period of reference or make prescriptive comments about the adequacy of a particular government policy. Nevertheless, it is acceptable for the chief statistician to advise that the extent of revision of quarterly or annual GDP cannot be cut down substantially within current budget constraints. Likewise, the chief statistician can claim that if questions relating to ethnicity must be the object of a dedicated survey, the budget must be increased. If the Government lacks confidence in the chief statistician's professional assessment, it should request a resignation.

105. Assuming that the chief statistician's overall performance is acceptable, the Government should not become overly involved in the internal affairs of the statistical office. For example, it is unacceptable for the Government to suggest to the chief statistician that in presenting quarterly GDP only seasonally adjusted numbers should be shown, or that the measure of inflation should exclude food (this is quite different from asking for a CPI sub-aggregate that excludes food; the former suppresses information, whereas the latter is a modification of a standard presentation for the convenience of the analyst).

106. It follows that the chief statistician must have the legal basis for, and would be expected to put forward authoritatively the following: his/her best interpretation of users' combined wishes; the manner (frequency, accuracy, timeliness, detail) in which those wishes can be met; the methods used to estimate; the burden imposed on the community; and the overall cost involved. The chief statistician should not be second-guessed or hindered unless it is to show that the Government has lost confidence. It is also understood that when the chief statistician announces his/her programme, all available stakeholders will have been consulted.

107. In situations where, in addition to being the head of the official statistical agency, the chief statistician is also the chief coordinator of the statistical system, he/she should be in a position to speak as a coordinator (as primus inter pares). In this capacity the chief statistician should have the authority to commit the system to certain standards and quality characteristics, as well as to address the social burden on behalf of all members of the system.

108. Finally, the chief statistician should be the spokesperson for his/her country in matters involving international coordination and exchanges;[26] its representative in international meetings; and the person who determines standards when they require revision or updating.

7. The competence of the chief statistician

109. The detailed knowledge required to choose among different systems options for a census of population or for a survey of large and complex enterprises is what one might commonly associate with a specialist, not with a senior executive officer. Nevertheless, such knowledge is expected from the head of a statistical agency. In addition, the chief statistician will be confronted with matters dealing with such issues as health, education, ethnicity, aggregation bias, treatment of outliers, leads and lags in the foreign exchange market, and assets held by private non-banking residents. On each of these subjects he/she will be expected to provide an authoritative opinion. Gaps in the chief statistician's expertise will diminish the professionalism that is one of his/her claims to independence.

110. For these reasons, the chief statistician requires above all the prudence to surround himself/herself with specialists who can propose comprehensible options and recommend those believed to be in line with the overall framework for which the chief statistician is responsible. In his/her debriefing on various options, the chief statistician must respond quickly at times and patiently at others, and must always demonstrate an enormous capacity to listen.

111. In the last few years, considerable attention has been devoted to increasing the capabilities of chief statisticians through various forms of international cooperation. Without creating very intensive cooperative arrangements such as those that exist in the framework of the European Union, regional conferences organized by the United Nations appear to be growing in stature, and a considerable investment has been made in informal meetings on specialized subjects, albeit at levels lower than that of chief statistician. The primary impetus for these conferences is to facilitate access and promote the exchange of opinions on potential solutions to common problems.

D. The national statistical council

1. Oversight or advice

> "…Irrespective of the degree of centralization of the national statistical service, a national statistical council or commission, composed of representatives of the private sector, the universities and Government, may be established either at the top of the external committee

[26] Admittedly there may be a problem in situations where the head of the research department of the central bank is the country's chief economic accountant, responsible for its national and government accounts, its balance of payments and the measure of the country's international investment position. In this case, international cooperation with other chief national accountants may be conducted via the International Monetary Fund and involve a different cast of characters. The position of the chief statistician on these matters will have to be clarified in a manner consonant with the importance and the dignity of the post. An unacceptable alternative would be to deal with two discrete entities.

> structure or independently of it… A top-level co-ordinating council may serve as a guiding and protective device - but mainly as regards the solution of problems of a general nature. Whether the benefits derived justify the cost is likely to depend, to a large degree, on national circumstances, including the political situation" [27]

112. In the 1980 *Handbook*, this passage constitutes the only reference to councils as advisory or governing institutions. Since these words were written, the importance of such bodies has grown, and their introduction in areas where they did not already exist has become a visible trend. Their roles vary,[28] but it is possible to state the following, taking into consideration their formal mission and the responsibilities they have assumed as their relationship with the statistical agency and its senior officers has flourished:

- A national statistical council can be used for the defence of the statistical agency. It exists to protect the statistical agency from attacks to which it cannot properly reply owing to restraints on public servants;

- The council can assume the role of guardian of fundamental values such as the protection of privacy;

- The council is the ultimate guarantor that, within existing resources, the statistical programme as defined by the chief statistician and instituted by his/her agency preserves the best possible balance among contending claimants for statistical attention, including economic, environmental and social statistics; national and regional details; and reliability and timeliness;

- The council is the interlocutor a minister might choose if he/she wishes to have the professional opinion of the chief statistician validated by a group of impartial experts;

- The council is the body a minister could turn to for advice and succession management in the case of a disagreement with the chief statistician;

- The council's proceedings would constitute a venue for registering opinions about the output of the statistical agency.

113. Since the various roles above imply different relationships - to the chief statistician, to the minister and to the public - it is also necessary to examine how the council may or should be inserted at the highest level of communications. The schematic presentation in figure 1 summarizes a few of the possible basic relationships between a statistical agency and what is referred to in the 1980 *Handbook* in a generic way as a "national statistical council".

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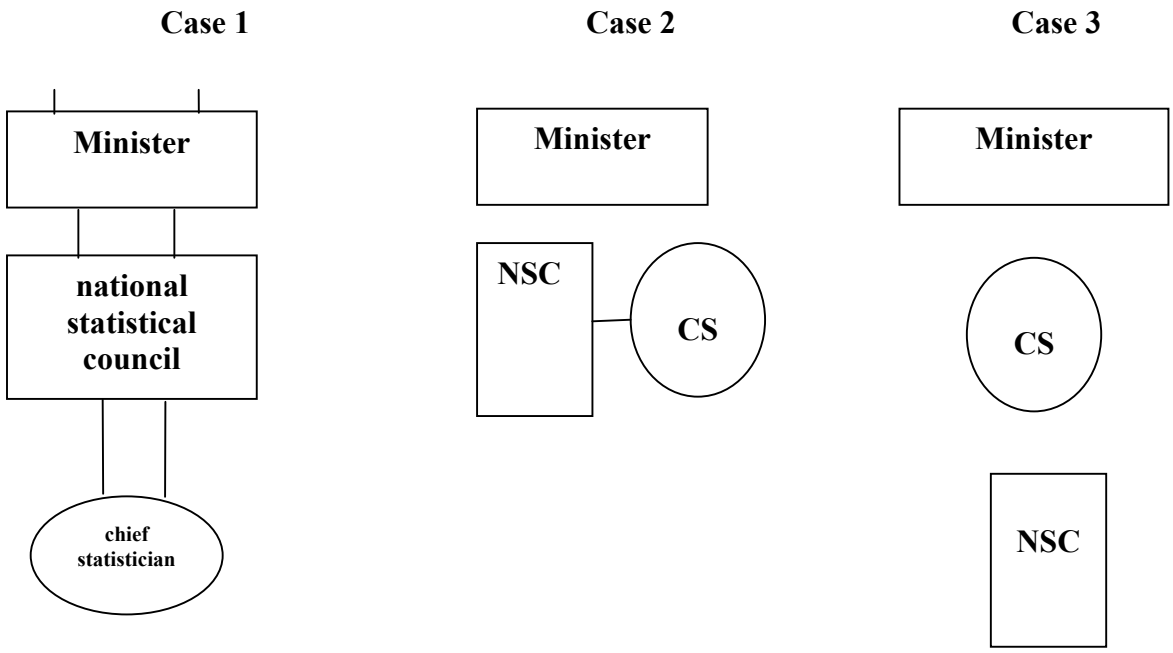
[27] 1980 *Handbook*, pp. 12-13.

[28] An example of a fairly typical advisory structure can be found in *Framework Document: Office for National Statistics (*London, 1996), para. 1.5, which states: "An Advisory Committee will advise the Director on the statistical work of the Office, on annual corporate targets and on his responsibilities as Head of the Government Statistical Service".

Figure 1. Illustration of three different sets of relationships between the minister, the national statistical council and the chief statistician [a]



Legend

NSC	national statistical council
CS	chief statistician
Minister	elected officer (generally a cabinet officer) responsible for statistical agency

[a] Even though the presiding body is indicated as national statistical council in all three cases, in fact its role ranges all the way from that of a board of directors to that of an advisory board.

Case 1

114. In this case there is no formal contact between the head of the agency and the minister. The chief statistician answers to, and receives broad guidance from, the council, whereas the minister instructs, and is advised and reassured by, the council.

Case 2

115. While the chief statistician takes direction from the minister,[29] the minister communicates with both the chief statistician and the council. It is also the minister who appoints the members of the council, and it is to him/her that they are ultimately accountable.

Case 3

116. The chief statistician appoints the council. Their advice may be freely shared with the minister, but only the chief statistician is ultimately accountable to the minister.

117. The texts of statistical acts of many countries are crowded with references to a statistical council or commission with real and imaginary powers. Often it is said that the council has either never met or has only had its initial ceremonial meeting. It is actually a loss of credibility to specify in detail what a council should do but not to be able to follow through with constituting it and seeing that it has documented meetings out of which is generated a flow of advice. It follows that in approaching this matter, the chief statistician (or the minister, or both) should:

- Choose from the available list the roles they feel are the most important in the medium term and which will therefore establish the powers assigned to the council;

- Identify those individuals who possess the knowledge and prestige to sit on the council; ensure their availability; and assess the likelihood of their being active and interested members.

2. Membership

118. The body of members on the council should be neither too big nor too small (probably somewhere between 10 and 40 members). Too small a council removes legitimacy, because some perspectives and points of view will not be represented. Too large a council will make meetings and debates unwieldy, difficult to schedule and to summarize, and altogether too costly. Clearly the scale will be a function of the usual variables such as the size of the country, the size of the office, per capita income and social interest in statistics.

119. The members must be selected on the basis that a variety of opinions and perspectives are sought, but by and large they must share an understanding and interest in quantitative analysis of the economy, society and the environment. Thus, academics, business people, government officials and the trade unions should be represented. In

[29] Under the Australian Bureau of Statistics Act (1975), has the Australian Statistics Advisory Council is written into the law. The Act specifies that "the functions of the Council are to advise the Minister and the Statistician in relation to: (a) the improvement, extension and coordination of statistical services provided for public purposes in Australia; and (b) annual and longer term priorities and programs of work that should be adopted in relation to major aspects of the provision of those statistical services".

addition, active and permanent media participation is very important, as the media are a means of disseminating data to the public.

120. In large countries, countries with federal constitutions and countries where there are distinct communities, the council should be a means of making sure that all parties have a voice. While the notion of a council representing diverse interests and opinions may seem contradictory to that of a council of manageable size, both factors must necessarily be taken into account.

3. Chairmanship

121. The personality, range of acquaintances, interest and availability of the council's chairperson are key to the success of the enterprise. If no one is qualified to fill the position as the council is being launched, it is perhaps best to postpone the enterprise until someone with the right characteristics is found.

4. Secretariat

122. There are various schools of thought regarding the secretariat. According to one, the chief statistician is also the secretary ex officio of the council. This view fits with the provisions of case 1 (see figure 1). While the chief statistician would call meetings, propose the agenda (under the guidance of the chairman) and draft minutes, he/she would be in a subordinate position, surrendering to the chair some of the powers normally associated with being chief executive officer. This course of action is most appropriate to situations where the chair is a person of great renown and seniority who is willing to maintain a high-level relationship with the statistical agency but not to work in it as a regular officer. However, these are exceptional circumstances and do not indicate a general rule.

123. The chief statistician may act as an ex officio member, taking active part in the discussions of the council, usually at the invitation of the chair, or he/she may act as any other member would, although the chief statistician would naturally possess more knowledge of the day-to-day activities of the statistical agency. This is a common situation, corresponding to the relationships illustrated in case 3. This situation has the advantage that is more acceptable because the chief statistician does not surrender any of his/her prerogatives while being engaged with other members of the council in a continuing discussion on the agency programme.

124. Another arrangement for the secretariat is to designate as secretary of the council an individual from the central statistical agency, who - as a rule - does this work on a part-time basis. In such an arrangement it is important that it is somehow (e.g., through legislation) made clear to whom the secretary reports, either to the chair of the council or to the chief statistician.

125. In yet another arrangement, the chief statistician may appear before the council only when invited, and then only to answer questions from the members. This is the obvious offshoot of case 2, which is sometimes structured deliberately so that an actively involved minister would be presented with two distinct opinions on any one subject.

126. No assumptions are made about political interference with any of these systems. In all cases, things can go wrong, or alternatively everyone can behave according to the best of expectations. In some instances, the existence of a body placed in between the chief statistician and his/her minister may prove to be an essential insulator for the statistical agency. In others, ministers may try to politicize the council and use it as an additional means to influence the behaviour of the statistical agency. In some instances, as in case 2, a minister may try to dilute a hard view expressed by the chief statistician with a more nuanced opinion arising from the deliberations of the council. In still other cases, a minister may find that his/her efforts are impeded by both the chief statistician and the council. In summary, one cannot predict the behaviour of these systems without placing them in their proper context.

5. Agenda

127. To avoid a dangerous confusion of roles and responsibilities, the chief statistician should exercise careful judgement when proposing an agenda for discussion by the council. For example, he/she should not involve the council in the micromanagement of the statistical agency. Such matters as detailed costs of surveys or improvement of the efficiency of projects at the operational level should be handled within the statistical agency, without external interference.

128. However, the agenda should include such matters as the council's view of the definition of unemployment; the worth of extending activities to the field of the environment at the expense of other statistical fields; or opinions on the most acceptable balance between quality and detail. If the chief statistician keeps on insisting that these are the issues that require outside help, then he/she will not be overrun with superfluous advice, and over time, will see an improvement in the quality and value of the advice that either he/she or the minister receives from the council.

6. Frequency of meetings

129. The nature of the agenda will tend to dictate the frequency of meetings, but a few words of caution are in order. If meetings are too frequent, most members will find them too onerous, and participation will probably lessen. If meetings occur too infrequently (for example, once every two years), the members will tend not to know each other and to have forgotten whatever they learned about the statistical agency during their induction. If the group of participants is relatively small - ten to fifteen - frequent meetings are easier to schedule, whereas with a larger body of members logistics get more complicated. Also, it is best to work with fixed schedules (for example, setting a fixed day of the week) so that meeting dates are predictable.

130. The reports should be publicly available, even if the subjects discussed are not the most engaging. Technology now makes it possible to publicize such reports at low cost. Placing on the agency web site a copy of the agenda, a summary of the decisions made and a list of actual participants will help to demystify the work conducted by the statistical agency and national statistical council.

7. Advisory committees[30]

131. In addition to the national statistical council, it has been found in many countries to be useful to form advisory committees.[31] In theory, these advisory committees could meet regarding a multitude of matters, but in practice they are most often adept at dealing with technical issues. Thus, such committees tend to be specifically oriented towards key problems of measurement such as replacing an outmoded way of measuring the flows into the labour market, estimating the productivity of sectors that have no priced output, dealing with the production of the informal sector and determining whether the CPI has a bias. The difference between these committees and the ones described in the paragraphs below is that while their opinion is authoritative they seldom deal with issues that are key to the survival of the statistical agency. Whereas certain ad hoc committees or commissions are convened in response to a crisis, advisory committees of the nature described here are designed mostly to avoid crises rather than to manage them.

132. Many countries have more than one such committee. The number of advisory committees depends largely on each country's capacity to support them; on the size of the community of experts sufficiently interested to take part in such discussions; and on the capacity of the agency to take notice of expert opinion and to institute recommendations where these are found to be appropriate. One benefit of such committees is that they help narrow the distance between academic and research statisticians on the one hand and practising government statisticians on the other hand, since many of the participants in such committees come from academic circles. Academic interest and participation in solving key problems of measurement narrows the gap between the two communities, and keeps official statisticians in close contact with intellectual advances that might contribute to their various branches of specialization.

133. Advisory committees have other advantages. If their membership includes interested government officials, they improve the sense of policy relevance of current statistics. If official data are criticized because of their conceptual or methodological inadequacy, advisory committees serve as sources of respected advice, as well as protection in the face of unfair criticism. Moreover, as additional friends of the statistical agency, they contribute to its reputation as well as to its capacity to reach out.

8. Ad hoc bodies

134. The creation of an ad hoc body should be reserved for crisis situations. It would be pointless to convene an authoritative body chaired by someone with a great deal of prestige, whose opinion would have to be taken into consideration by the Government if the problem under review were not of appropriate importance. For example, if users were

[30] The use of the term committee here should not be confused with the prevalent use of the word "committee" in States members of the Commonwealth of Independent States to denote the central statistical agency.

[31] Sometimes such committees report to the statistical agency, and in other cases to the national statistical council. For example, the Central Commission for Statistics in the Netherlands (the equivalent of a national statistical council) has about 25 standing advisory committees that handle a wide range of subject-matter areas.

concerned that calculation of the GDP accounts were biased or plainly wrong, the very essence of economic measurement would be affected. If not promptly addressed by a dispassionate group of experts at the highest level, such doubts could profoundly threaten the credibility of all economic figures published by the statistical agency. Two general points should be mentioned in relation to these advisory bodies:

- The membership needs to come from outside the central statistical agency;

- The reporting relationship of advisory and ad hoc committees varies considerably among countries and depends upon the circumstances of each individual country.

E. The law

> "The subject of statistical legislation can be reduced to two major issues: the compulsory aspect, that is, the power the Government asserts, through the statistical agency, to collect data; and the guarantee it provides for safeguarding the confidentiality of the information collected from individual respondents".[32]

135. Laws regarding statistical agencies are largely similar, although the wording may differ: the State (or the Government, people's assembly, etc.) grants certain rights to a body, hereinafter designated as a statistical agency. In the law, this body's organic structure is explicitly laid out, including the requirements for the person at its head; the constraints under which it is supposed to operate; and the accountability that prevents it from abusing its rights or acting arbitrarily. The law dictates what the statistical agency is expected to do with the information respondents submit to it, and for which it is accountable. The community of respondents is asked to comply with the statistical agency's demands for information so long as they can be justified in the name of the objectives set by the law. In exchange for intrusion upon privacy rights, the statistical agency is required to safeguard respondents' information. If the agency breaks this commitment, its officers are subject to certain sanctions. If respondents do not comply, they too are subject to certain sanctions. While laws differ from each other in length, style, detail, and scope, if they do not cover the fundamental points outlined above, they are incomplete.

136. The 1954 *Handbook* includes an exhaustive list of subjects that may be covered by the law. Consulting the *Handbook* in this regard is worthwhile, partly as a matter of historical interest and partly because some heads of agency may still find it useful as a checklist if they entertain any wishes to get their own law changed. Annex I of the present *Handbook* contains a model statistical law.

1. Main Actors

137. Usually the law defines the main actors and their rights and accountabilities. In the case of the legal provisions for an official statistical activity, to be referred to as a "statistics act," those actors are:

[32] 1980 *Handbook*, pp. 36 ff.

- The minister
- The chief statistician
- The statistical agency and its staff
- The agency responsible for the coordination of the statistical system
- The respondents

138. The statistics act will also define a set of relationships with other bodies that could include:

- Other government offices
- International or supranational institutions
- Professional societies
- Trade and other associations incidental to statistical activity

139. In the case of countries with federal constitutions, the act will define the relationship between the federal statistical agency, the statistical agencies located in the Governments of members of the federation and other government agencies of the members of the federation.

2. The law: short or long

140. The length of the law is initially a matter of preference, but its implications are real and subtle. A lengthy law stems from the desire to provide it with sufficient detail to avoid political arbitrariness once it has been implemented and is acted upon. For example, specifying in detail the membership of the coordinating agency or of the national statistical council guards against its manipulation for political favours or nepotism. However, the more detail is added to the law, the less it is able to adjust to changing circumstances. Over time, environmental changes and other unforeseen circumstances would require legal changes and it is always very difficult to awaken political interest in modifying a statistics act.

141. Both cursory and detailed laws offer benefits. In some situations, a very generally formulated law that gives a great deal of flexibility to the statistical agency has worked well. Conversely, lengthy and painstakingly detailed laws have afforded key actors a great deal of protection. Of course, there are drawbacks in both cases. What this suggests is that a workable compromise between these two possibilities should be found and that the success of the lawmaker lies in getting the compromise right.

3. The law: deterrence and enforcement

142. Legal power to demand response, accompanied by legal sanction for failure to respond, can do much to ensure high response rates that are in turn essential for the overall quality of statistics. Nevertheless, the matter is not as simple as that. In fact, the existence of legal powers to ensure compliance inherently serves as a formal deterrent. In most countries where such powers are well defined in law, the statistical agency has never used them or else has used them very, very occasionally.

143. Today the usual pattern is to operate a mixed system, either tacitly or openly. Mixing options take various forms. One is to regard all inquiries from enterprises as compulsory and the law may as well be unambiguous on this matter. At the same time, all surveys of persons or households are regarded as voluntary. Whether this is stated openly or only if challenged depends to a great extent on the political and legal environment and the way the public views invasions of privacy. If there is an official protector of privacy - an ombudsman, for example - the chief statistician may be unwilling to risk all household inquiries for the sake of a Pyrrhic victory in any one of them: there is no known way of legally countering a campaign of civil disobedience in matters of statistical surveying.

144. Whatever the system, although cooperative relations will play a preponderant role in determining response rates, the law may be a necessary condition upon which to build such relations.

4. Access to information protected by other laws

145. It is best if the statistics act makes clear provision for the statistical agency's right of access to other government data holdings. This should be done partly to streamline government operations but, more importantly, to alleviate excessive paperwork on the part of respondents.

146. The right of access by the statistical agency to administrative holdings of information useful for statistical purposes should be explicitly recognized as an exception in the legislation that protects such holdings or in general, administrative registers. An ideal state of affairs is one of reciprocity, where the statistical legislation lays down the rights and conditions of access, and the specific legislation that protects administrative holdings, wherever they may be within Government, recognizes as an exception the right of access by the statistical agency for statistical purposes.

5. Legal advice

147. Even though the structure and content of a statistics act should be straightforward, a chief statistician should have access to legal advice, preferably a specialized legal adviser who is an expert in the interpretation of the statistics act and in the treatment of its various exceptions. The legal adviser will be of inordinate value in cases of conflict between the statistics act's provisions for rights of access and the formal restrictions embodied in other acts.

6. Special legal arrangements in decentralized systems

148. In the case of decentralized systems, the statistical act should apply to all the members of the statistical system. For example, if a statistical agency or research department is located within the central bank, is its legal authority to collect data from other banks determined by the general authority of the central bank or by a specific law or regulation authorizing the responsible department to collect supplementary information for statistical purposes? If there are discrete statistical agencies in the ministries of transportation, agriculture, public works, interior and so on, what are their legal rights and restrictions in terms of the collection of data, access to microdata and the form in which individual records are stored and accessed? How does the central statistical agency decide whether the particular cell is or should be a bona fide member of the statistical system? Ideally, the following minimum legal provisions would apply:

- All members of a statistical system should have a legal basis for their collection operations;

- All members should have provisions defining their legitimacy, accountability and obligation to hold individual information in trust, as well as the sanctions to be applied if those obligations are not heeded;

- All members should be bound to the same rules and safeguards under which individual information can be shared for purposes of statistical integration and generally for effective analytical work;

- The act should contain provisions acknowledging the need for, and definition of, statistical coordination, as well as guidelines on how it is carried out.

F. Financing the statistical system

149. This section considers, from a general perspective, who should bear the financial burden of producing statistics. Although the two previous versions of the *Handbook* covered this subject only in the broadest terms, it is now generally felt that adequate funding of statistics is a key issue in sustained statistical capacity-building around the globe. Of course, the meaning of "adequate" will always be the subject of debate, and even in developed countries ongoing budgetary pressures make priority-setting in statistical programmes a fact of life. Nevertheless, few would argue that, in general terms, the funding of statistics in developed countries is inadequate. In contrast, the situation is entirely different in developing and so-called "transition" countries.

150. On a philosophical level, there has been some discussion of the financial burden and proper allocation of the cost of official statistics. Basically, there are two poles (with a wide range in between): (a) the Government pays for information that is needed for decision-making, is a public good or is needed to inform the electorate, and it provides this information free of charge to the public (or at most for the marginal cost of dissemination); or (b) the Government collects and pays for the information that it needs

primarily for its own business; the costs of collecting, processing and dissemination any other information should be borne by the user.

151. Something of a watershed in the discussion of these two approaches has been the Rayner Report[33] in the United Kingdom, but it should be noted that the view expressed in (b) above (which is the gist of that report) has since fallen out of favour because it is incompatible with the principles of political transparency and accountability. However, some of the elements in the Rayner report, such as the introduction of payments between departments as a mechanism for improving the allocation of resources, have since been adopted by some offices. It should be recognized that such questions are mostly relevant for countries where the use of statistics is firmly anchored in tradition; where the community of quantitative analysis both in and outside the Government is considerable; where political decisions are largely evidence-based and statistics are an integral part of this evidence; and where the allocation of funds and transfers among the parts of the community are driven by statistical measures.

1. Sources of finance

152. On a more practical level it is useful, first of all, to look at the two main sources for the financing of official statistics: (a) appropriations through the government budget, both for the central statistical agency (if there is any) and for "statistical cells" in ministries; and (b) revenue that statistical offices generate by selling products and services at market prices.

153. The first source is far more important than the second. Few statistical offices generate more than 10-20 per cent of their "income" from sales. In addition, in quite a few countries, the revenue that statistical offices generate cannot be used for their own operations but goes directly to the treasury.

154. The main questions concerning financing that are of interest today include:

- What information is placed in the public domain free of charge or at the marginal cost of dissemination and what information will be provided for a fee;
- If information is provided for a fee, what should the charges be based on? How does an agency that is a monopoly guard against the abuse of its powers;
- Should charges apply to intragovernmental purchases/sales of special information.

155. These questions have been complicated by the fact that conventional publications are no longer the main vehicle for the dissemination of statistics, but rather the CD-ROM or the statistical agency's web site on the Internet.

[33] Report to the Prime Minister by Sir Derek Rayner, London 1980. See also *Government Statistical Services*, Cmrd 8236 (London, Her Majesty's Stationery Office).

2. Financing through government budgets

156. Although, on the one hand, the process of securing sufficient government funding for statistical organizations may be highly country-specific, on the other hand, the procedures that are actually followed have many similarities. First of all, it is important for funding to be based on clear, systematic, transparent multiannual and annual work programs. In some countries, particularly in developing countries and those in transition, it is also important to develop and promulgate a long-term "master plan"[34] in the appropriate government circles. Secondly, it is vital for the statistical agency (or agencies) to mobilize sufficient political support from their user community. A statistics council may also be an important instrument to achieve such support. Thirdly, in securing funding, it is very helpful if the statistical agency is seen as a well-managed organization that is proficient in planning and cost-accounting and in producing clear management reports that show progress, income and expenditure, under- and overspending, and so on.

3. Market pricing of goods and services

157. Several considerations favour allowing a statistical agency to supplement its budget by the sale of goods and services at market prices.

Box 4. Two key definitions: goods and services

Goods, or "information products" are self-contained arrays of quantitative information, with or without interpretation, which can be stored for future retrieval. The medium in which these arrays are recorded is immaterial. Thus, such "goods" might include a yearbook of national accounts; a CD-ROM with the standard industrial classification; and tables on exports and imports by commodity groupings, downloadable from a web site.

Services are activities carried out by the statistical agency to create a statistical information product. Examples of "services" include providing an algorithm for the selection of a sample of small businesses from a shared register; testing for residual disclosure in a particular table; and testing a time series to see if it meets a set of conditions that makes it eligible for seasonal adjustment.

158. First of all, the sale of such goods and services gives some assurance that the entire community is not funding a specialized commodity that is of interest only to a select number of users. Secondly, allowing statistical agencies to keep the proceeds of their sales of services provides an incentive for them to take advantage of unused capacity. Having such flexibility would prevent the user organization from developing its own survey capacity, with all the duplication of effort this could represent. Thirdly, it may promote a user-oriented culture in statistical organizations.

[34] In the cooperation programmes of the European Union, such a master plan is usually called a multiannual integrated statistical programme (MISP).

Conclusions

An examination of the classification of statistical systems favours the creation of a stand-alone institute or bureau. It is better to attach a recognizable name to the production of official statistics than to disseminate them anonymously or too discreetly. In recent years, budgetary problems affecting central Governments have necessitated structures in which the effective coordinating power lies in the hands of the research departments of central banks.

There is no question that concentration and critical mass provide opportunities and means of action that dispersion or fragmentation hinder. Even so, the expense and legal impediments related to the process (as distinct from the state) of centralization may be such that its feasibility is limited. In those cases where the head of a central statistical agency is thwarted in his/her attempts to reduce the fragmentation of the system, but wants to derive the greatest benefit from coordination, several tools are available, all of which can be tried in some degree. They include, in addition to mobilizing political support:

- The creation of a national statistical council
- The coordination of budgetary allocations for statistical activities
- The management of the corps of statisticians in the public sector
- The international exchange of staff
- Data collection approval
- International standards

Strong leadership is key to the effective performance of a modern statistical agency. In order to attract good leadership, the job must have the right status. Chief statisticians must demonstrate their objectivity and impartiality by acting independently of political controversy, but at the same time must maintain close contact with their peers in other ministries. Chief statisticians must display a rare combination of professional and managerial talents, although the proportions of each will vary according to the objective situation. Governments must not appear to be frivolous or arbitrary in demanding that the chief statistician resign if need arises, nor should they allow the continuation of a state of affairs in which energy and inventiveness have long been exhausted. Lastly, the capacity of a chief statistician can be augmented through intensive contacts with his/her peers abroad.

Securing stable (and in the case of developing countries increased) financing for statistics is an important responsibility for the chief statistician. To obtain political support for stable finances, setting up sound planning instruments (such as annual and long-term work programmes) is helpful, as well as promoting the image of statistical offices as well-managed organizations.

III. USERS AND THEIR NEEDS

> "We need statistics not only for explaining things but also in order to know precisely what there is to explain". [35]
>
> Statistics is the "branch of political science dealing with the collection, classification, and discussion of facts (especially of a numerical kind) bearing on the condition of a State or community".[36]

159. Statistics are compiled to answer questions and, at times, to allow questions to be formulated with sufficient precision. Some inquiries are developed once and made continually (e.g., how many people who sought work this month were unsuccessful?). Other questions are asked less frequently (e.g., how many ton/miles can the railways system deliver per week?). Some questions are modified as the underlying reasons for asking them are modified in response to technological advances or the shifting relationship between the public and private sectors. Some questions still have not been answered (e.g., is the apparent slowdown in productivity increases merely a consequence of measurement problems, or is it real?). By and large, statistical agencies are accustomed to converting a general question into one to which a practicable answer can be found.

160. A statistical agency should strive for the organization that is most likely to produce an adequate statistical programme within the constraints of its budget, the capability of its staff and the intrinsic difficulty of the questions with which it is faced.

161. It is not only the demand side that is susceptible to external change. Technological changes may affect the ways in which statistical agencies are organized and, consequently, the way in which statistical information is collected and supplied. Advances in telecommunications and computer technology have vastly increased statistical agencies' scope and power in processing raw information Taken in conjunction, these two developments constitute a reason why geographically decentralized field operations may not be needed much longer.[37] However, a geographically decentralized field operation may become a useful extension of the statistical agency's dissemination facilities, in addition to carrying out its traditional functions.

162. Changes in technology constrain a statistical agency in other ways. Business organization is shifting rapidly from national to regional, or even to global, modes.

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[35] J.A. Schumpeter, *History of Economic Analysis* (London, Allen and Unwin, 1955).

[36] *The Oxford English Dictionary*, Second Edition, vol. XVI (New York, Oxford University Press, 1989).

[37] Precisely how much longer they will be required will of course vary from country to country. However, given the speed of diffusion of modern telecommunications and computer technology, even those countries with lower per capita income should be able to apply these technologies to their field operations in the not-too-distant future.

Communication and transportation technologies facilitate tight control and informed decision-making, which can be maintained irrespective of the geographical span of the business. However, the legal basis of a statistical agency is still very much bound by political frontiers; the agency cannot act beyond its national borders, regardless of the extent of its legitimacy at home or the importance of the information to its government constituents.

163. Changes in environment, equipment and expertise create new needs, which dictate changes in the agenda, policies and organizational structures of statistical agencies. The following paragraphs examine some of the typical features of the demand for statistical products by various constituencies.

A. The needs of Government

164. By its very nature, statistics is of special interest to Governments. In addition, official statistical agencies are largely financed by the central Government, although exceptions can be found. For example, there are instances in which the Government contribution to the statistical agency's budget is supplemented by the proceeds of sales of goods and services to all users, including the private sector. There are also instances in which statistics compiled by private sector research agencies over a long period of time acquire semi-official status. However, in the majority of countries, the largest proportion of the budget is supplied by the national treasury, aided at times by grants from international agencies.

165. As the source of financing, the Government may try to exert leverage on the activities of the statistical agency. When it helps determine priority activities, this leverage can be constructive. Conversely, when it attempts to delay the release of a vital number, modify a number, or defy a change in definitions or methods, such leverage may be detrimental. We have already seen why the latter activities are harmful. The present chapter examines constructive activities.

166. The needs of Government, like most needs of potential users, are not usually expressed in terms that lend themselves to instant data collection. They are divided into two categories: needs that call for regular observations of the same variable and needs that require information collected on an ad hoc basis. For example, regular observations are needed to find out the change in average consumer prices from one week, month or quarter to the next, so as to maintain a current perspective on inflationary pressures; the relationship between receipts and payments from and to other countries in case the treasury runs out of foreign assets; and the expected annual school enrolment by small area within particular regions, in order to ensure that classroom space and teacher supply meet the demand. These needs are met by the regular publication of statistics with known and describable properties, such as the consumer price index, the balance of trade and balance of payments with the rest of the world on goods and services and population projections by gender, age and area. In the majority of countries, there are

intermediaries[38] who interpret the current statistics in light of those compiled earlier and inform decision makers about changes that may require attention.

167. In some cases the Government requires ad hoc statistical information to explain the roots of a particular problem. This situation becomes complicated when there are no measurement conventions geared to the nature of the problem or the expected answers. Examples of such problems include whether the scale of evasion of value added tax collected appears to be growing; whether the underground economy is growing; whether the current policy on incarceration makes best use of resources to meet stated objectives; and whether current pay scales discriminate against women. In such cases, the very nature of the evidence may be open to interpretation and discussion. Clearly, translating users' information needs into the data collection or rearrangement that will eventually take place is a complicated process.

168. Some problems persist irrespective of time, place and method of Government or structure of political system. "How many people are there of military age?" was a popular question even two thousand years ago. "What gross tonnage is available to feed the inhabitants of the British Isles?" has had a fairly long tradition and was until recently a matter of concern to many cabinet ministers in the United Kingdom. Other problems are entirely new and are the result of technological innovation and of the changes in the way economic agents organize themselves in response to new techniques. These problems also exert pressure on statistical agencies, not only for the compilation of new information but eventually for the reorganization of basic data as well.

1. Ministries of finance

169. The needs of ministries of finance are long-standing, even though the form in which data must be presented changes in conjunction with advances in economics and accounting. Their needs range from measuring the wealth of the country to balancing the State ledgers and setting aside resources for future generations.

170. A ministry of finance attempts to ascertain whether imbalances exist between the uses and the applications of resources, and what impact those imbalances can have. Of particular interest are those imbalances that affect the labour market, raising questions about how much is required from labour to maintain the current production level.

171. A ministry of finance must know how changes in quantities and prices interact to change value. By and large, a ministry of finance is more interested in statistics that relate to rapidly changing variables, such as the demand, rather than the supply, side of the overall balance. For this reason, its questions tend to be clustered around the behaviour of the major demand aggregates: consumers, the confidence with which they behave in the marketplace, and the portion of their incomes they are prone to save; investors and the structures and equipment they wish to acquire; businesses abroad and the willingness they display to purchase nationally produced goods and services. Other ministries are more interested in looking into the supply side of the balance.

[38] For an explanation of where those intermediaries should be located (within or outside the statistical agency), see chapter 10.

2. Other ministries

172. These are the so-called vertical ministries (agriculture, mines, energy, transportation and communications are the most frequently encountered examples), and they need to know the size of their respective constituencies. In addition to some core information about production and its structure, such as employment and rates of return on capital invested, each ministry has a unique set of interests relevant to its sector. For example, the ministry of agriculture tends to be particularly concerned with improving crop production forecasts and learning about the environmental effects of herbicides and fungicides; the ministry of transport, with road safety, the condition of the rolling stock, and the adequacy of airports; and so on. At times, the special interests of these ministries precipitate detailed regulation of their respective sectors.[39] This certainly has been the case with both road and air transportation in a number of countries, although in the last ten to twenty years, the motto of some of these ministries has been "deregulation".[40]

173. Ministries of energy have become very important in recent years and are to be found in both producer countries and dependent user countries. Essentially, their concerns are met if the statistical agency succeeds in compiling a current balance of energy supply and demand that allows substitutions, shortfalls, import requirements and other concerns to be detected. The ministry will seek to ensure, for example, that the country's endowments are not depleted too rapidly; that prospecting and drilling take place in an orderly environment; and that fuel substitutions are based on the correct rates of exchange. As in previous cases, this is a ministry that not only wishes to keep abreast of the size and resources of its constituency but also requires information of the kind that only specialists would possess.

174. Ministries of labour are known by a variety of names, such as the ministry of employment or human resources. Their interests include the condition of the labour force; the facility with which it can take part in gainful occupations; equitable remuneration of the workforce; workplace safety; the availability of appropriate training facilities for employees whose skills are no longer needed as well as for those whose skills are in short supply relative to emerging demand; and the detection of barriers to geographic mobility where geographic, rather than overall, imbalances in demand and supply exist.

175. Examples of cross-cutting ministries (or, in some cases, parts of ministries) are sports, culture and tourism. Their primary interest is to evaluate the sector for whose promotion (or regulation) they are responsible and to determine its unique characteristics

[39] In regulated sectors, the forms used to ensure compliance frequently are, or can be, used for statistical purposes.

[40] Deregulation may have been good for free enterprise, but it posed a dilemma for statistical agencies. Some statistical agencies relied on the regulatory information requirements of these ministries, finding all the information they needed in the specialized ministries' administrative records. Not only did deregulation put an end to this state of affairs, but in many instances the ministerial authorities passed new legislation, asserting that henceforth the paperwork burden they imposed would be drastically diminished. These promises compounded the problem created by the absence of administrative records. A few countries still have not found a way to improve this situation.

so that resources can be efficiently assigned.

176. The ministries of health and education tend to be the largest of the service ministries, and their portfolios cover both public and private sectors. Licensing and/or regulating are onerous parts of their ministerial chores, demanding a great deal of detailed quantitative information. Moreover, the authority of these ministries, which are part of the central Government, typically dovetails with that of government authorities at other levels.[41]. Since these ministries assume regulatory duties, a wealth of detailed information is generated as a result of their administrative processes. The information requirements of these ministries have become increasingly dominated by the notion of effectiveness, which requires measuring the outcomes of their policies and actions. Administrative records are insufficient to measure outcomes. As a result, questions about effectiveness lead to demands for supplementing administrative records with independently generated statistical information within an analytical framework.

177. Since the Government is responsible for an overwhelming share of the provision of education services in many countries, questions arise regarding efficiency and public accountability. Examples of such questions include: How much does it cost society to provide free schooling for all children up to the age of 15? How are the costs recouped? Are the physical facilities adequate, or is there inequity in the provision of the service? Do the teacher/student ratios ensure effective use of the resources assigned to education? Are they likely to continue doing so in the light of the age of the workforce and the growth in population? Are there enough teacher training facilities to guarantee the maintenance of current teacher/student ratios?

178. Similar questions arise in the health sector. Are marginal expenditures on additional hospital beds more effective than expenditures on improved home care if the objective is to minimize pain? In general, statistical agencies must resist the temptation to compile information that is understandable and amenable to a count but uninteresting from the point of view of the policy and decision makers. Rather, the agencies must devise methods and techniques that will allow them to address the more difficult problem of measuring outcomes. In the case of health, education, and science, there is no designated length for the period of observation before an outcome can be assessed. Finally, the most important question to which decisive answers have not yet been found: is a marginal public investment in health (education, scientific research, etc.), in the light of the observed outcomes, commensurate with the expected return?

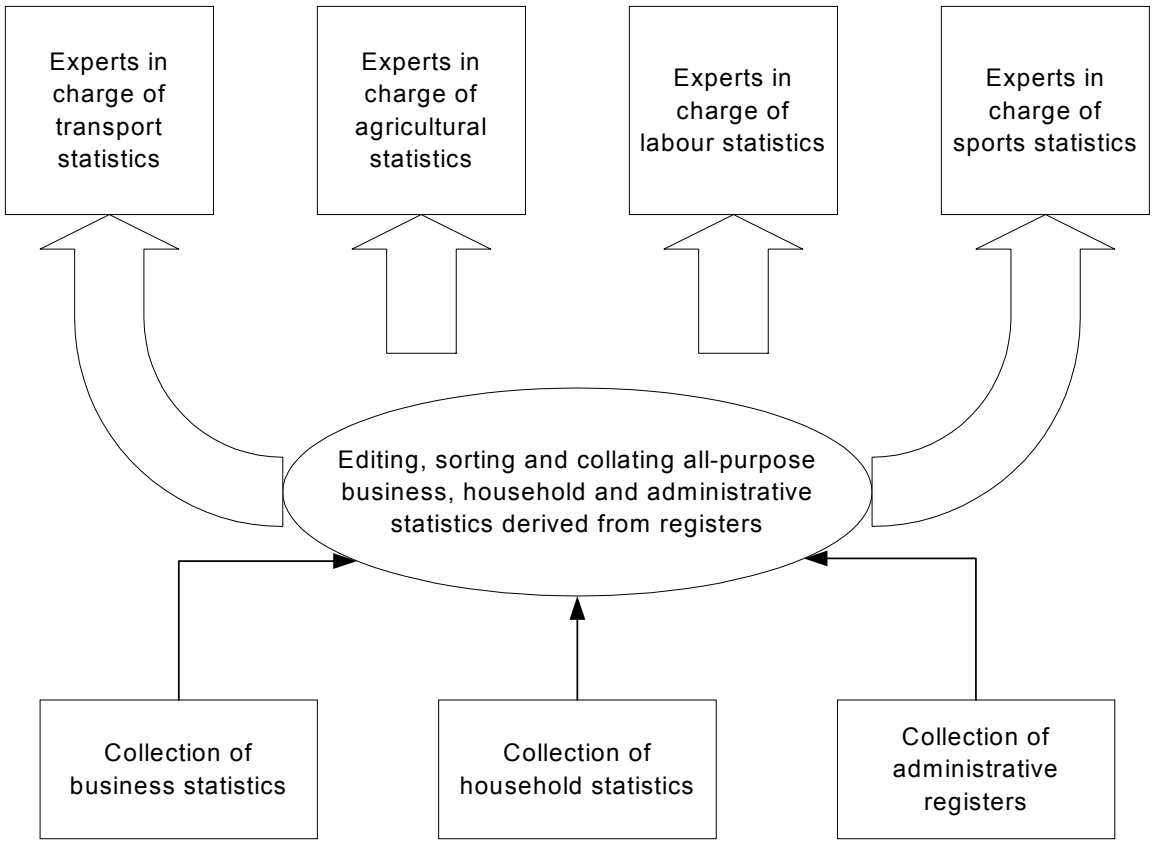
179. If it becomes clear to all that the question of effectiveness drives the need for information. Taking into account the difficulties in measuring effectiveness without making very controversial assumptions, the national statistical office should establish a close partnership with health economists, school administrators, criminologists and natural scientists. Such a partnership should be designed to help clarify the limits of the information available in these domains and the possible progress that a statistical agency can make.

[41] Municipal authorities; or, in federal countries, with regional, provincial or state authorities.

3. Organizing and establishing contacts

180. A core of general information is of great interest to each of the ministries, however small their portfolios. That core contrasts with a number of specialized questions that are more efficiently answered by specialists. A statistical agency should ensure that the most efficient arrangements are in place to gather core information and that the ministries have access to specialists who will participate in the dialogue on the areas of particular interest (see figure 2).

Figure 2. Schematic representation of a statistical agency organized to collect, process and disseminate data in selected specialized fields



181. An essential point is to find ways to be sufficiently linked to the policy analysts in the specialized ministries in order to (a) foresee what kinds of problems are likely to arise several years from now; (b) foresee which part of the current demand already met by ad hoc information from the statistical agency is likely to become a fixture in the near future; (c) conduct a dialogue with the relevant ministry experts; and (d) supplement all-purpose statistics with more specialized information.

182. The organizational scheme illustrated in figure 2 is general enough to suit both decentralized and centralized systems. In the case of the former, each "expert" box might correspond to a statistical cell (or bureau) in a separate ministry. Moreover, each of those cells might carry out its activities in any one of four possible ways: by having its own

collection capability; by commissioning the central statistical agency to carry out the collection on its behalf; by adding statistical requirements to the ministry's collection of administrative records and separating the statistical from the general information when the records are collected; or by contracting a third party to take charge of the collection operations.[42]

183. In the case of a centralized system, each of the "expert" boxes corresponds to an organizational unit within the central statistical agency. This unit may be in charge of liaison or dialogue, or it may fulfil an advisory function or other objective corresponding to a particular ministry or complex of institutions sharing the same concern. The essential properties of each cell include the following:

- The ability to foresee requirements and understand their nature and statistical implications;
- Knowledge of available information and ways to supplement it, so that a database capable of satisfying current and future needs can be created;
- Access to existing information—individual records if necessary—in order to ensure correct matching and record linkage;
- The direct or indirect collection capability required to add specialized information to the existing database.

184. Experience has shown that meeting the third requirement can present delicate, although not necessarily insuperable, problems of intrusion into the privacy of individual citizens. Some of these problems are strictly connected to the legality of access to individual records. Others, assuming the legal barriers are overcome, are more problematic because they concern actual intrusions into privacy, which may require special institutions for control and regulation.

4. Regional and local government

185. Problems relating to the interaction between statistical agencies and regional authorities are similar to those relating to interaction with ministries; the latter cut across subject areas, while the former cut across geography. This is a simplification of the problem of assessing and satisfying the information needs of other levels of Government. A more detailed examination of the problem reveals questions concerning problems of access to officials who work for different levels of Government; issues related to central versus regional politics; and constitutional issues that may pose formidable barriers to communication and access.

186. Often, those responsible for regional Government will ask for a small-scale version of what is done at the national level. Thus, if the national agency compiles national accounts, a consumer price index or other information, it is likely that all of these, limited to the scope of the region but as comprehensive as possible, will be

[42] The underlying assumption is that the statistical cells have unimpeded access to the collective database.

required to satisfy regional authorities.

187. More realistically, the needs of regional and local authorities will be subordinate to those of the government apparatus. Thus, all of them, irrespective of size, will be interested in the number of people (or families or households) who live under their jurisdiction; the demographic and income characteristics of this population; employment status; housing conditions; and possibly health and education attributes. Such information makes planning at a local level possible. [43]

188. In most countries with a federal constitution, each state (province, autonomous region) has a Government with certain well-defined interests, as well as a residual set of concerns that, by consensus, are left to the federal level: for example, foreign trade and payments can be managed only at the national level.

189. The problem posed to the central statistical agency is how, without compromising reliability or thoroughness, to meet the requirements for information for geographical areas that are substantially smaller than the nation. Different countries respond to this challenge in various ways. For example, in some countries the national statistic is essentially the sum of the statistics estimated by the offices of each of its politically defined regions, except in matters explicitly of federal concern. In other countries, an understanding is reached whereby the national statistical agency agrees to supply local offices with core statistics of equal merit[44] for each subject area, to be supplemented with information collected by each local statistical agency.

190. Whereas discussions with specialized ministries often involve meetings with experts, discussions with local or regional authorities are more likely to be policy-oriented and to involve the chief statistician. The reason for this is simple. Most statistical agencies are equipped to make effective use of censuses at the local level (their usual purpose), but they are not positioned to provide a wide range of reliable non-census data at the local level. Widespread over-sampling of businesses and households intended to meet particular requirements of regional authorities would deplete both the budgets of central agencies and, perhaps more importantly, the goodwill of respondents.

191. Part of the dialogue between central statistical agencies and regional and local Governments assesses what useful statistical information can be squeezed out of existing administrative records, as well as ways to persuade the collectors of administrative records to take into account possible regional requirements. In those situations where there is access to these records, their coverage is usually adequate for small areas. The outcome of this dialogue, if successful, is a mixture of national and regional statistical estimates with local area information derived from administrative records.

192. Managing the requirements of government agencies - local, regional and specialized - is a matter that requires great delicacy. The chief statistician can err by being too far removed from the centres where the requirements are formulated, too quick

[43] See "Regional statistics: proceedings of a meeting" (Neuchatel, Swiss Federal Statistical Office, 2000).
[44] The word "merit"as used here, is meant to encompass both equal detail and equal reliability for those details that are preserved at the local level.

to create precedents that the budget of his agency will not allow to be generalized, or insufficiently forthcoming. The sum total of these errors may lead to the creation of alternative data collection agencies, making overall coordination much more difficult.

193. With this in mind, a chief statistician is well advised to create permanent contacts with prospective public-sector users to keep abreast of the way requirements are evolving and of the quality of the service that the agency provides. The form those contacts will take and the level of the designated liaisons will be dictated by efficiency concerns. Ultimately, the chief statistician will have to articulate a policy with a number of necessary elements:

- Statistics that are compiled nationally but accompanied by regional breakdowns;
- Ways to ensure the reliability of regional statistics;[45]
- Conditions of access to the regional database;
- Support for regional agencies that wish to supplement their own databases with resources available at the national level;
- Consultation on geographic classifications.

194. The chief statistician should keep lines of communication open to local and regional bodies at all times and bestow authority upon someone in whom he or she has total confidence. Few situations can escalate as rapidly as a centre-periphery misunderstanding, with mutual recriminations arising from a failure to communicate openly.

195. In general, allowing representatives from peripheral bodies to see a statistical agency from the inside is the best possible way of demonstrating its inherent limitations. Thus, it might be advisable for the central agency to accommodate trainees from the regional organizations. Where no group ethos of statisticians exists, one might institute surrogate measures to develop one. In the end, the creation of a national community of statisticians bound by common professional interests (e.g., through a professional association that recognizes professional standing irrespective of level of Government), may turn out to be a more potent device to preserve harmony between the centre and the regions than the introduction of purely organizational measures.

B. The needs of the public

1. The community at large

196. The public keeps a watchful eye on regular statistics such as the CPI and the unemployment rate, as well as on overall economic performance. The statistical agency

[45] It is best to negotiate these attributes so that interlocutors can become aware of the difficulties involved in providing geographical breakdowns. The reliability features referred to would include timeliness, the best measure of error possible and supplementary detail.

should be able to address these concerns. At the same time, it should capitalize on the public's ongoing interest and ensure that its name is automatically associated with the publication of data with which the public is most concerned. The statistical agency should also strive to inspire confidence in its efforts to maximize the quality of these key measurements.

197. The public also has requirements that are not so substantial, permanent or well defined. The difficulty lies in the inchoate state of these requirements and in the fact that a particular interest may flare up at any moment in response to a particular situation, most often an unforeseen event of a threatening nature (e.g., What was the value of the housing destroyed by last week's hurricane? How much in savings has been wiped out by the latest bout of inflation? How many illegal immigrants are there in a particular city? How large is the underground economy?). One way to address these concerns directly is to maintain a small ad hoc survey capacity characterized by a very quick turnaround.

2. Schools and high schools

198. The introduction of statistics in school curricula is a means of instilling respect for quantitative information and analysis. Both primary and secondary schools offer a variety of courses in which statistics play a visible role. The following are examples of basic questions that appear in the curricula of many schools at both the primary and secondary levels: What is the population density? How many people live within the country's borders? How wealthy are they? What do they do in their leisure time? How are they employed? How many of them are poor and need help? Do they have access to educational and health facilities?

199. The names of the relevant courses vary from country to country, but the subject matter is more consistent than the terminology suggests. Several statistical agencies have a special programme to support initiatives by the educational system to promote the use of quantitative data at an early age.[46] In Poland, there is an active high school competition for the best essay in which extensive use is made of official statistics. In other countries, schools are granted premium access to the national database of the statistical agency.

3. The press

200. The press and other mass media play a special intermediary role in the relay of statistical information, whether it is the subject of national or local interest. For this reason, the statistical agency is responsible for ensuring, not only that the right information gets into the right hands at the right time, but also that it is properly described and imparted in the appropriate form to those who most need it.

201. No statistical agency has the power to ensure, for example, that all those whose lives are affected by a change in the measured level of consumer prices become aware of

[46] More ambitious courses can easily be envisaged to prepare young people for a university education. For example, an introductory programme in macroeconomics for high school children might use national accounting data, and programmes in applied mathematics or statistics might use live statistical series to illustrate techniques of time series analysis.

that fact exclusively by consulting a statistical bulletin. Even in countries where the population is measured in tens of millions, statistical bulletins are seldom published in quantities of more than a few thousand (with the possible exception of the occasional prestige publication, which may be issued in quantities of two or three times the average circulation).

202. For these reasons, the agency will have to rely on the press to ensure that statistical news reaches all interested parties. This creates several challenges, which will have to be addressed through a liaison organization:

- Ensuring that newspapers, television, radio and magazines all become aware of the latest statistical information at the right time;
- Ensuring that the statistical office is responsive, even outside of normal office hours, to the deadlines of the press;
- Providing, along with the latest numbers, the necessary amount of explanation so that press reports are balanced and accurate;
- Periodically reviewing with the press the arrangements made to ensure efficient dissemination;
- Making all possible efforts to present statistical news in a manner that minimizes misinterpretation and enhances clarity;
- Holding seminars for members of the press to highlight simple analytical techniques for interpreting and assessing current data.

A number of statistical offices have made permanent arrangements to meet these challenges and maximize the value of the press to the statistical agency.

Box 5. Colouring statistical news

This heading is not meant to suggest impropriety. Ensuring that the news gets interpreted properly does not imply manipulation of the subjective views of the press. Rather, it implies that everyone should be aware of the pitfalls of interpretation. For example, if toy imports escalate significantly in the month of November (in a country where a large proportion of the population celebrates Christmas), this is not necessarily a harbinger of disastrous news for the national balance of payments. Rather, it may mean that domestic toyshops are preparing for Christmas, and the relevant comparison is not with the previous month but with the same month one year earlier. Such is the situation with unique events - e.g., the leasing of three jumbo jets for the national airline or the effects of a strike or a natural disaster - which may distort the expected figures and play a major role in their interpretation.

Recognition

The statistical agency should be recognized when statistical headlines are broadcast. Often, the mass media make references such as this: "Government officials claim that this month's production of cement is well above expectations, leading to an optimistic outlook for the construction industry….". Correcting the failure to single out the statistical agency responsible for the estimation should be a matter of priority. Giving the agency credit not only reminds the population of its existence, role and responsibilities, but also reinforces its imprimatur on the release of key figures and impresses upon users that those figures have a special character of reliability.

203. In most countries and in most political systems, Governments can be elected or their tenure of power can be ratified on the basis of promises made to the electorate. Promises range from the general ("we shall make this country secure for our children") to the very specific ("we shall keep the rate of unemployment below 5 per cent"). Political accountability in the latter example can take place only in the light of an objective measure (official statistics) that informs public opinion about whether or not the Government has kept its promise. In this instance, opinion is formed in two ways: the public may decide that the Government was or was not faithful to its electoral platform, or it may decide that the standard of measurement - the official statistic - was unreliable and therefore of no consequence in its ultimate judgement of Government performance. The press can play a constructive role in ensuring that the judgement of performance does not get mixed up with the reliability of the statistics.

204. Many statistical agencies have earned the public trust in their word and in their institutional guarantee. Clearly, this situation is desirable for every statistical institution. Since the press can be a valuable ally in this task, investing in a press liaison is worthwhile.

C. The needs of business

205. Ultimately, all business users share similar interests in quantitative information. The fundamental questions are: How many businesses like ours exist? How do they compare to us? What are the prospects for our business and for those with similar attributes? Other interests are essentially variations on these fundamental questions.

206. To provide an answer, the statistical agency must first define "us". From the statistical agency's point of view, the definition should be as wide as possible, so that sampling techniques can be used effectively and the seemingly insoluble problems of accurate coding can be overcome. From the point of view of the potential user, "us" should be as narrowly defined as possible, to account for the large number of idiosyncrasies in what is being compared.

207. Once the scope of "us" has been defined, the next challenge is to select the attributes that must be compared to satisfy the interests of business. In principle, all economic variables are potential subjects of comparison. Thus, examples of important attributes include the number of employed per unit of revenue and per unit of profit; the structure of costs; the size of the market measured in number of customers and in gross revenue; the composition of the market in terms of purchasers at home and abroad; the return on capital invested; the rate of product innovation; and the prices quoted.

208. Of all these variables, and in most lines of business, the two that appear to be of greatest interest are the rate at which prices are adjusted to conditions of overall and specific demand and the rate at which the products or services of a business are influenced by technical and organizational innovation.[47]

1. Large businesses

209. There is a degree of similarity between the interests of large businesses and those of a ministry of finance and its respective specialized sectors. Obviously, if businesses cater to national markets and possess multiple lines of specialization, the only useful point of comparison is the rest of the economy. Their questions will resemble those of the ministry of finance, with an emphasis on cost structures for activities of special interest; cost structures of competitors abroad; information on barriers to their activities abroad (both tariff and non-tariff); and financial information on investment at home and abroad.

210. In many countries, big business represents a disproportionately large share of GDP, and therefore neither its requirements for information nor the accuracy and promptness of its responses can be ignored. For this reason, a number of statistical agencies have instituted a special unit with the exclusive function of managing relations with large businesses. Not surprisingly, the first agencies to institute such units were in those countries with the highest concentration of large businesses. However, the payoff has been so significant that others have followed suit. Today, there are examples of big business units in large and small statistical offices, and in industrially advanced as well as emerging industrialized countries.

211. A large business unit has a multiple roles. Therefore, it stands out as an exception to the simple rules of organization along the statistical production process. Its responsibilities include the following:

[47] The timeliness constraints on these data are usually not as stringent as those on general-purpose data such as the CPI or GDP.

- Keeping a current record of the boundaries and structure of large businesses (these businesses change configuration very quickly, so what is reported in one period may not be significantly comparable with the previous period);

- Keeping track of the businesses' accounting practices to distinguish between internal transfer pricing and arm's length market pricing;

- Deciding, in communication with designated business contacts, the statistical questions that can be answered directly by using account information, and those that require estimation;

- Making sure that each business is required to answer each question only once and that the answer is used in all databases for which that information is required;

- Communicating with the research department of the business enterprise regarding its needs for information and the most convenient medium in which to provide the data;

- Gathering, from discussions with the research department, information as to the intentions of the business regarding innovation, investment and acquisitions abroad as well as general confidence in the domestic market.

The larger the business, the more explicit and articulated will be each of these responsibilities. [48]

2. Small businesses

212. Satisfying the information needs of small business is the greatest challenge for business statistics for a number of reasons. In the first place, the ratio of effort deployed in answering requests for information, both regulatory and statistical, from the Government to the economic size of businesses is much higher for small than for medium-sized and large businesses. The ratio is almost as high as that for households. In addition, even when the need for information is well formulated, the specifications tend to be so detailed - in terms of what the business does, where it is located, and with whom it wishes to be compared - that the statistical agency finds it difficult to comply with such requests to any professionally acceptable degree of reliability. The third reason relates to the nature of small business needs for information; even though they tend to require highly specific statistics, small businesses may be reluctant to comply with all of the Government's demands for detailed information because devoting the necessary time and resources would significantly add to their overall costs. The statistical agency will find it very difficult to accommodate small business needs if it does not have access to key administrative records and the ability to use them for statistical purposes.

[48] There is at least one example of a publication of big business statistics. In Argentina, the Instituto Nacional de Estadistica y Censos (INDEC) not only has a unit in charge of large businesses, but also uses a separate survey for them and publishes a statistical bulletin reporting the results for the principal economic variables.

Box 6. Examples of administrative records of use for small business statistics

However, under most circumstances, the high level of corporate income tax information limits its usefulness in deriving small business statistics. In addition, the apparatus required for collecting direct taxes is unevenly developed, so income tax records are of little help in many of the countries where the activities of small business and their relationships to the informal sector are of special interest, even where access is granted.

Conversely, indirect taxation is a virtually universal source of information. In recent years, Governments in many countries have made special efforts to ensure that such taxes, particularly value added taxes, are levied and faithfully reported to the proper authorities. They have also made special efforts to ensure that social security records are complete and accessible. While access to and use of these records is only useful to measure and describe the organized sectors of the economy - at times leaving a large swathe of informal economic activities nearly untouched - nevertheless, the information that can be gathered from the records is more substantial than any information the statistical agency could collect unaided. If it relies on indirect tax records, the agency is free to concentrate its efforts on household and related activities that may for a time resist the effects of taxation and social security reforms.

213. Despite all these difficulties, small businesses are of undeniable importance. They are numerous;[49] play a key role in the service sector; are widely recognized for their innovation, particularly in the dynamic activities that characterize a modern economy; and, according to some analysts, play a key role in job creation, particularly in the early phases of a cyclical upswing. For these reasons, their wishes must factor into the dissemination programme of a statistical agency.

214. There are two aspects to meeting the information needs of small businesses, both of which affect the organization of the statistical agency - the collection and dissemination of the information itself and the training of small-business employees to use the information to their advantage.[50] One of the most significant barriers to the survival of small businesses is gaining access to credit on affordable terms, and to do so, they must demonstrate how their costs and gross profits compare with those of their competitors. Thus, what is of prime interest to them is not averages and totals but rather the distribution of key ratios and how they compare with other businesses in their category. Examples of such ratios are advertising costs to total cost; equity to credit; and accounts receivable to total revenue.

215. Using a table with distributions of key ratios may be intimidating at first, particularly for some entrepreneurs who are apt to trust their intuition or salesmanship more than unfamiliar arrays of numbers. For this reason, the statistical agency may wish to offer seminars for small-business managers and take advantage of trade fairs and similar events to display its relevant products.

[49] In Canada, according to the *Business Register* (Ottawa, Statistics Canada, regularly updated), small businesses (defined conservatively) accounted for 95 per cent of all businesses with one or more employees. Taking into account zero-employee businesses, the proportion should rise to approximately 98 per cent. Other countries of comparable size and development have a similar makeup.

[50] Some imaginative approaches along these lines can be used to establish a dialogue with business enterprises in the informal sector - for example, showing them, free of charge and of commitment, how they can analyse their performance by using statistical tables.

216. The demographic characteristics of markets are also of interest to businesses of any size, particularly those who cater to the final consumers or to freelancers who work from home. The age, gender, family and income attributes of the population in very small areas are of the utmost importance to them, but they may not have the knowledge or the confidence to approach a statistical agency and request cross-tabulations derived from the population census. In order to cater to those wishes, statistical agencies may have to utilize specialized consultants who can estimate potential sales of a wide range of articles on the basis of a combination of small-area census variables and the results of the latest survey of family expenditure.

217. In any case, maintaining a unit within the statistical agency that specializes in small-business concerns is valuable. Its responsibilities should include the following:

- Maintaining expertise in the handling of administrative records so as to satisfy current demands, either exclusively or primarily with the information they contain;

- Organizing events of interest to small business and using them as opportunities to disseminate extracts of existing databases and to assist small businesses in the effective use of statistical publications;

- Championing small-business claims for limitations on the paperwork burden generated by Government in general;

- Serving as permanent liaison between the statistical agency and such agencies as social security, indirect taxation, and customs.

D. Research and other needs

1. The academic world

218. The academic world can place burdensome demands on a statistical agency, but it can also be the most important ally in defining research and action programmes, in evaluating the quality of the statistics produced and in helping explain to laymen the underlying strengths and weaknesses of official statistics. Therefore, contacts with members of academic institutions are a strategic resource and should be as extensive as possible.

219. The needs of the academic world cannot be summarized as easily as those of other sectors. In theory, they encompass all activities of a statistical agency. Any research in the social sciences[51] that is conducted in an academic institution and requires testing places demands on statistical agencies. However, academic needs may differ from the needs of other sectors in at least one fundamental respect. All other sectors require statistics for formulating policy, examining options, and ultimately making decisions, and are therefore less prone to worry about how the data are generated. The reverse is true for

[51] Increasingly, the state of the environment and the condition of a country's natural resources have become subjects of statistical activities and, of course, are of interest to academic researchers.

the academic community. For example, in testing a particular economic theorem, it may be crucial to distinguish between data as they are observed and data altered by standard editing processes. In addition, academic researchers are far more likely to dispense with the statistical agencies' analyses in favour of their own. For these reasons, the statistical agency should establish a liaison with academic researchers, but a distinct unit is not required.

220. Agencies that have a special methodological unit in charge of survey design and estimation may be tempted to locate the liaison with universities in such a unit, at least for researchers in applied sociology, demography, criminology and microeconomics. This should not preclude contacts with other parts of the agency.

221. Naturally, macroeconomists prefer to establish their liaison with the agency's national accountants and are less interested in the sampling aspects of the underlying statistics. However, much of the communication between the statistical agency and academia will be the result of individual circumstances. The essential point is to capitalize on the contribution to the statistical process that can be made by academic institutions. Many statistical agencies have programmes that allow for an interchange between university researchers and the more research-inclined members of the statistical agency. To carry out such an interchange, the university and statistical agency may each assign researchers to the other institution, or they may collaborate on projects of mutual interest.[52]

2. International institutions

222. In many countries with advanced statistical systems, the programme requirements of international agencies[53] represent no more than a marginal addition to the statistical agencies' domestic programmes and can be treated as a by-product of current activities, but this is not always the case. Indeed, in some statistical agencies, apart from special large-scale initiatives such as the census of population, the requirements of international organizations dominate the current programme.

223. For many statistical agencies, international agencies remain the most important source of conceptual and methodological guidance, not only in improving their capacity for inter-country comparisons but also in structuring domestic programmes. The demands of international organizations impose a discipline without which inter-country comparisons would quickly become either unachievable or meaningless. Comparisons are possible largely due to the use of international classifications and standard accounting systems such as the System of National Accounts (SNA).

224. Despite the benefits the international agencies bring, their intervention also often creates significant problems. Since an international agency can furnish highly needed

[52] Several papers address the subject of "blue-collar" and "white-collar" statisticians. See, for example, Martin B. Wilk, "Blue and white collar statisticians", in *Proceedings of the Statistical Society of Canada*, 1985.

[53] This refers to international agencies only. The demands placed by supranational agencies on member countries are of a different nature and magnitude, depending on the closeness of the relationship.

resources, it is difficult, if not impossible, for many developing countries to approach the offer from an international agency as an arm's length transaction. Moreover, the intervention of the agency may cause significant disruptions in the programme of the national statistical office. Situations have also arisen in which the data collected by the agency is published without any review by the country. Finally, too often, international agency programmes have not been accompanied by a transfer of technology from the agency to the country. Thus, while, valuable information has been collected, there has not often been a corresponding improvement in the statistical capacity of the country. Fortunately, this situation is changing and international agencies are increasingly committed to capacity-building. One of the important responsibilities of the chief statistician is to ensure the maximum amount of capacity-building while continuing the cooperation with the international agencies.

225. Chapter III has examined the need to create a specialized unit charged with particular function. Nevertheless, taking such a step should not be viewed as a panacea. A great deal depends on the size of the office, its stage of development and the weight of the problems it faces. In many instances, it is sufficient to assign one person to the task. In other cases, it is best to distribute responsibility throughout the agency. When the specialized position can broaden agency employees' experience by exposing them to keen, analytically minded users, it is favourable to distribute the responsibility.

Conclusions

Statistical agencies should create a programme that is as versatile as possible, in order to serve users with a wide range of questions and concerns. The remarks above illustrate the variety of those concerns and questions. However, a statistical agency cannot confidently predict the nature of future concerns and the types of questions that might be answered through the use of official statistics. Accordingly, it must invest in the ability to produce general purpose, versatile tabulations. A statistical agency can, and should, also invest in ensuring user access to techniques that allow for rearranging basic data to better conform to specific objectives. Yet this is only possible if there is a clear understanding of the nature of the questions.

However an agency is organized, consideration should be given to the assignment of specialized functions (in a distinct unit or not) with a dual mission:

- Detecting, through close contact with all sectors, upcoming matters of concern that may require statistical support;
- Following up with representatives of the various sectors to determine the adequacy of the service provided by the statistical agency.

Some functions would benefit from the cooperation of the relevant subject-matter experts. In a few special cases, specialized units may be created to address each function. Such cases include relations with large businesses; small businesses and their associations; and the press. In all instances it is imperative that the findings of these units be incorporated into the formulation of priorities and the corresponding plan of action.

IV. SETTING PRIORITIES

> "Ideally, priorities should be determined on the basis of analysis of the costs and benefits of various alternative ways of using the scarce resources.…Although … the cost of statistical projects can, in principle, be identified and measured, this is rarely the case with their benefits. The problem here arises from two main factors. First, statistics are intermediate products, not end products. The benefit of a statistical series is a function of its impact on policy decisions and their importance; it is generally very difficult to pin it down and attach a meaningful value to it. Secondly, the process of identifying benefits is all the more difficult both to the extent that the series are part of a system in which the diverse elements are interdependent and the value of each is enhanced by the availability of the others.…Thus, priority setting and allocation of resources among competing possibilities in statistics cannot be calculated precisely but must be determined…on the basis of judgements and insights based on past experience…in order to render priorities and related resource allocations as rational and balanced as possible".[54]

A. Analysis of user requirements

226. The previous chapter underscored the fact that meeting the demand from some users requires a specialized understanding of the corresponding sectors (for example, health and education). It also showed the need to maintain a special relationship with large businesses (multi-location, multi-activity, multinational) that in many instances account for a disproportionate share of a country's GDP. These considerations have a number of implications for the statistical agency. Chapter IV examines how various requirements give rise to a plan of action to ensure a balance between information supply and demand.

Box 7. Should there be a planning unit?

The question of establishing a planning unit within the statistical agency has not been a matter of discussion or systematic exchange of experiences in recent international venues. It is nonetheless an important question, one that is of consequence to the larger and more complex statistical agencies. The general advantages and disadvantages are easily described. Having a specialized planning unit reduces the time spent planning by the substantive experts of the office and allows for more control, consistency in presentation and ease in verifying internal consistency in execution. However, it increases very substantially the risk that the planning activity will be treated as "someone else's responsibility" by the substantive part of the office and never is as internalised as it should be. As a solution, some offices have adopted a mixed regime, in which the planning unit is responsible for the formal part of planning and for acting as a secretariat to the planning effort (or committee); the substantive part of planning rests squarely with those whose activities are to be planned. Naturally, in mixed organizations of this type the cost of planning increases - but so do the chances that it will be taken seriously.

227. The process described in the above citation is circular. While several attempts have been made to establish a "calculus of priorities", none of them has gained wide acceptance. The idea behind some of these attempts is to weigh several attributes, such as the importance of the request (using some arbitrary unit of measurement); the cost of answering it fully; the cost of a partial, short-term answer; the effects it might have on other activities within the statistical agency; and the consequences of denying a request

[54] 1980 *Handbook*, P. 61.

for statistical information on the relevant decision or policy (again using some arbitrary unit of measurement). The scores derived from these attributes would be used to compile a table ranking each priority. However, up to now this process has not proven to be successful, and while such methods would introduce a consistent and explicit set of factors, the conclusions would be are no less arbitrary.

228. A chief statistician cannot avoid prioritizing the activities to which an agency is committed. Fortunately, priorities do not change from one day to the next. The activities of a statistical agency are constant. Indeed, from one year to the next, a statistical agency will not change its agenda by more than a small fraction of its total resources (5 per cent is probably a generous estimate), with the exception of large-scale initiatives such as the censuses of population, agriculture and economic activities. In addition to these endeavours, the statistical agency is likely to continue measuring, from one period to the next, the variation in consumer prices, the rate of industrial production, the amount of international trade in goods, the size and condition of the labour force and so on. Once these activities are taken into account, the allocation of additional resources should be at the discretion of the chief statistician, who can initiate subtle changes in direction by placing a somewhat heavier emphasis on one activity or another.

229. Nevertheless, not every single one of the activities carried out regularly by a statistical agency is static. In fact, as part of the standard work of an agency, products are added or removed from the CPI, new nomenclatures replace old ones in the compilation of trade statistics, and changes in the population are ultimately reflected in the sample on which a labour force survey, for example, is based. Moreover, in many offices there is a systematic effort to carry out habitual tasks in a more productive and effective manner. The success of such effort frees up resources, which in turn can be allocated to alternative activities. Accordingly, setting priorities turns out to be not so much an exercise in the evaluation of discrete subjects but rather a series of marginal changes in an ongoing programme to which additions and subtractions are made at regular, and sometimes even predictable, intervals.

230. In order to preside over this process, the chief statistician, to a greater or lesser degree, requires the following:

- Authoritative information about what various constituencies perceive as gaps in the range of statistical products and an understanding of why those gaps are awkward for policy formulation;

- Information about emergent issues of public concern that may require statistical information;

- Information about the cost of alterations to the existing programme, including possible additions in light of the two elements noted above;

- A mechanism to sort out possible requirements.

231. These four elements underlie the planning process, which can be handled formally or informally. The advantage of formality is not so much the intrinsic value of the ceremony but rather that it impresses on all participants that the planning of a statistical programme is one of the most important, if not the most important, statistical activity that an agency's management can undertake.

232. Priorities should be determined within a framework. Nowadays, frameworks are referred to as strategic overviews, strategic frameworks or corporate strategies. Mostly, these headings apply to the same thing: a medium-term plan that allows the agency to acquire, maintain or change existing capabilities while continuing to meet new requests.

233. Priorities ought to be selected from within this framework, not because it is fashionable to do so, but rather because it is the most effective way to ensure that the priorities are clearly articulated and that the priorities are considered as a whole rather than in piecemeal fashion, which could result in inconsistent and duplicative activities. The alternative is distinct descriptions of activities with no coherence.

Box 8. Balancing of requirements

In setting priorities, achieving a balance is very complex. For example: [a]

1. A balance must be achieved between servicing users who need detailed data in specific data in specific fields and those who need across-the-board aggregative data for macroeconomic and social analysis;

2. A balance is required between different subject-matter fields. This balance should ensure that some resources are assigned (a) to projects that are in their early stages of development; (b) to strengthening weak areas; and (c) to carrying out at least a minimum of research and analysis;

3. Within each subject-matter field there is a balance between different projects both across the board and in time. The importance of covering the entire field must be balanced against the need for detailed statistics in parts of the field;

4. A balance is needed between timeliness, accuracy and publication of detail;

5. Finally, it is necessary to find a balance between satisfying user needs and avoiding undue burdens on the supplies of primary data.

[a] *Handbook of Statistical Organization: A Study on the Organization of National Statistical Services and Related Management Issues,* Studies in Methods Series F, No. 28 (United Nations publication, Sales No. E.79.XVII.17), p. 61.

234. It is generally accepted that one can precisely define the costs but not the benefits of statistical undertakings. There is no way to answer the question of how many people will benefit directly or indirectly from the publication of a particular number and to what extent. Nevertheless, a chief statistician's decisions regarding the allocation of resources implies that the balance of costs relative to benefits is more favourable in one direction than another.

235. The issue is to assess needs and concerns in order to learn how a statistic can be beneficial to its potential users. Since its usefulness cannot be quantified, one should have at least a general impression of what that use might be.

236. Clearly, the formulation described above is rather abstract. In practice, there is no substitute for an enquiring attitude, one that seeks to relate systematically proposed new statistics to the questions they are deemed to be helpful in answering. Furthermore, those questions should relate to the concerns of the general public or the Government.

237. On the supply side it is important to track costs and to keep a history of costs of different kinds of statistical activity. A chief statistician should at least be able to argue in relative terms about costs and benefits—for example, if **x** were spent on activity A, **y** should (or should not) be spent on activity B given the apparent (albeit non-quantifiable) benefits of A relative to B. Tracking costs for planning purposes should be the object of considerable attention and respect within a statistical agency and should include the following:

- The ability to assess the value of a statistical activity (e.g., conducting a survey, compiling an account, editing an administrative file, publishing a statistical bulletin) with a degree of accuracy adequate for planning purposes;

- The ability to archive and retrieve the results so that they can be used to price future activities;

- The ability to reveal alternative uses for the same resources;

- A mechanism to record decisions and assign accountability.

B. Developing a progress plan

238. Notwithstanding the limitations of planning, experience shows that embarking on any complex initiative (conducting a family income and expenditure survey, launching a quarterly labour force survey, compiling an input-output table) without a plan is a prescription for unmanageable turbulence and very uncertain outcomes. This uncertainty is worsened by the interdependency of a statistical agency's undertakings. For example, the input-output table cannot be compiled without the survey of inter-industry purchases and sales; the latter cannot be conducted without the new commodity nomenclature, which in turn requires a production survey; and so on. Planning for all the interdependencies and expecting them to function precisely, though, is not realistic. Rather, in addition to careful planning, considerable flexibility, local discretion and fallback positions are necessary. The art of planning statistical operations consists in finding a way to manage all of this in a timely and realistic fashion.

239. The next section introduces the various purposes and elements of a plan; the difference between a multi-year exercise and a single-year plan (which is more akin to a traditional budget); the significance of "accountability"; and lastly, the plan as a teaching device once its results are evaluated.

1. The annual plan and its constituents

240. Essentially, a plan consists of the following elements:

- A clear set of objectives to be met by the end of the planning period;
- A description of the steps to be taken;
- A list of the requirements—environment and resources—to ensure the practicality of the objectives;
- A discussion of fallback options should the outcomes not meet the objectives.

Additional elements include the mechanisms for monitoring and evaluation.

241. In chapter IV of the 1980 *Handbook*, a considerable space was devoted to describing in detail a three-tiered planning structure, comprised of a system of overall planning, based on a long-term plan of a "strategic" nature; a medium-term plan of a more "tactical" nature; and a short-term "operative" plan.[55] The 2002 edition of the *Handbook* focuses primarily on operative plans.

242. An operative plan must be annual, for a number of reasons. The plan follows the standard budgetary cycle, which is annual. In addition, preparation of the plan on a yearly basis establishes a routine, so that the plan is not forgotten. Devising the plan more frequently consumes an inordinate amount of resources and imparts a sense of instability. Finally, the annual plan must fit into a longer-term framework in order to prevent the creation of a series of disjointed annual plans and ensure that the statistical system, while maintaining its flexibility, will not be faced with changes in direction that it cannot accommodate.[56]

2. Making allowances for size and uncertainties

243. Many offices are small - 100 staff members or fewer - and have unpredictable budgets, either because of political circumstances or because a large portion of their resources come from international initiatives over which the office has limited influence. Thus, if there were a concerted push to measure poverty on an international scale or examine the factors that affect fertility, the scale of operations required might account for a very large component of the office's total activity. In this context, the existence of a multi-year plan could help ensure that international programmes reflected national needs. The principle of having a five-year plan and an annual set of objectives firmly anchored in that plan applies equally to small offices and to much larger ones, although the latter tend to have a more predictable budget. The difference is that in smaller offices, the

[55] 1980 *Handbook,* p. 70.

[56] Assuming that the annual plan is part of a five-year medium-term programme, that resources are constant and that the maximum permissible annual shift in staff is only 5 per cent gross, at the end of the term one quarter of the staff might be doing very different things from what they were doing at the beginning.

actual implementation of an undertaking can be much more informal, allowing for greater flexibility.

244. Multi-year plans have multiple purposes, involving perceptions as well as organizational realities:

- Impressing upon the staff that their work is part of a larger scheme and is not a routine continuation of some arbitrary disposition creating a basis for measuring the performance of the office and of its organizational units;

- Recording experience in order to improve future allocation of resources and reliability in carrying out tasks;

- Increasing the efficient use of available resources;

- Documenting inadequacy of resources relative to imposed tasks;

- Improving the perception that the statistical agency uses rational criteria to organize its activities.

245. These objectives are somewhat easier to attain if planning is open; if a significant proportion of the staff takes part in the establishment of the plan;[57] and if there is a collective effort to learn from experience by reviewing systematically the differences between activities planned and activities carried out. However, there is no avoiding the cost involved to document, track performance, record costs and organize a structure that is cohesive and achievable.

3. The role of ceremony

246. On the one hand, the expectation that detailed plans can be fulfilled with total precision is likely to cause frustration with the entire planning exercise and may lead to a premature abandonment. On the other hand, introducing the plan in a manner that is too lax may lead to its never being addressed with the respect that is required for it to function effectively. This is why, in a number of offices where the annual planning activity has become formalized, the discussion and promulgation of the plan are subject to some ceremony.

4. Planning and budgeting

247. Perhaps surprisingly, the institution of sensible planning is a measure that usually leads to less, rather than more, detailed control of the various parts of an office. Attaining high-level objectives is only possible if local managers have the discretion to modify their approaches in the event of unforeseeable circumstances. This means that effective planning requires the establishment of a sound budgeting approach, complete with a statement of how authority is to be delegated.

[57] "The 1980 *Handbook* (p. 70) states: "The major objectives of planning are…to involve as many staff members of the statistical agency as possible in the priority setting and integration function".

248. Conceptually, the relationship between the two activities is as follows. A plan is created, taking into account all the interdependencies and outlining a set of objectives, a schedule and steps to be taken to ensure that the objectives are met.

249. The plan will appoint agents to head its various activities. Each agent will be given a discretionary budget and the responsibility for achieving a balance between income and expenditures. Handling matters in this fashion has the added virtue that each agent will become more conscious of costs. If the performance in meeting objectives is judged from the point of view of efficiency, the various agents will have the incentive to find methods and techniques that will allow them to meet objectives with the resources allocated (rather than the somewhat perverse situation that has been known to occur, wherein managers spend as much as possible to demonstrate their authority). Essentially, planning involves controlling the resources allocated to agents, thereby requiring that they achieve their goals within the given resource constraints. This arrangement applies to offices of all sizes.

5. Planning and accountability

250. The greater the discretionary authority given to planning agents, the greater their accountability. In the framework of an open plan with a great deal of devolution of authority and responsibility, the chief statistician will ask for accountability from the staff. If the management establishment is too inexperienced to carry out its part of the agency-wide plan, the chief statistician will not be able to comfortably delegate budgetary authority. An organization can be considered efficient if the head of the system can rely on subordinates to help formulate and carry out both a medium-term and an annual plan.

6. Evaluation of the plan

251. At the end of a planning exercise (annually and, on a more strategic basis, every five years) the chief statistician should receive a formal[58] evaluation. This evaluation may be conducted by an outside party or by a unit within the statistical agency, depending on the political, legal and regulatory circumstances. The evaluation serves several purposes:

- Accounting to the government for the work of the agency;
- Conveying to the staff the seriousness of the process;
- Determining the degree of error in the process—exogenous (beyond control) and endogenous (subject to control and future improvement)—and attempting to explain the causes;
- Validating or changing the agency's strategy;

[58] Although for smaller offices it could be informal, the effort to prepare and disseminate the result of a formal process can be helpful nevertheless.

- Using the results to engage the organization's management in a dialogue regarding accountability.

252. For the process to be credible, evaluating and planning should be carried out by two different parties; in fact, the greater the organizational distance between the two, the better. It is also worth considering the possibility of using the evaluation as a training opportunity. For example, recently recruited professionals can serve as assistants to an evaluation secretariat, thereby receiving their introduction to the planning exercise. It is not critical to constitute an evaluation secretariat as a permanent organization. Indeed, it may be rather difficult to justify it, as it is unlikely that it will have work year-round. One option is to have a standing committee headed up by someone who is indisputably knowledgeable and objective. If circumstances allow, evaluation (and similar tasks, such as audits) might consistently be handled by retired senior officials of the agency.

Conclusions

A statistical organization has no objective "calculus of priorities". The chief statistician must combine intuition and insight with the experience and current knowledge to make decisions with confidence. Once this becomes routine, the agency will be able to formulate, albeit in a qualitative way, some of the benefits of a planned course of action. It is important to implement an effective mechanism to track, measure and record costs. For a planning exercise to be effective, it must reflect the right balance of decisiveness and staff participation. It should be part of a medium-term framework and should be treated as the annual definition of activities, their cost and the corresponding resource requirements. The staff, having taken part in the creation of the plan, should be held accountable for its execution. The practice of evaluating the plan ex post should be strictly observed, as a means of enforcing accountability and learning from experience.

V. PRINCIPLES OF ORGANIZATION AND REORGANIZATION

253. The literature on organizational theory demonstrates that organization is not a trivial matter. Most importantly, while there is no single, ideal way to structure an organization, some commonly accepted general principles can be identified.

254. This last point applies to statistical organizations as well. In theory, there are at least a dozen different, sensible ways to organize a statistical office. Remarkably, though, in spite of clear differences in detail and even in organizational philosophy and culture, a great deal of similarity can be found in the organization of statistical offices across the world. For example, a director of economic statistics from the statistical office of country A is likely to find a counterpart with very similar responsibilities in country B. The same applies to a director of social statistics or national accounts, or the director (or head of department) of price statistics, the business register, environmental statistics or dissemination. Without a doubt, common underlying principles are at work when it comes to organizing statistical agencies.

A. Theories and trends

255. There are some widely accepted, alternative approaches for structuring organizations:[59]

(a) By knowledge or skill (e.g., departments of cardiology, internal medicine and neurology in hospitals);

(b) By work process, often based on the technology used (e.g., letterpress and offset departments in a print shop);

(c) By business function (e.g., manufacturing, research, engineering, accounting);

(d) By output (different product lines or services in different divisions, e.g., household appliances, machinery, maintenance);

(e) By client (different organizational units for retail to households, big business clients, etc.);

(f) By time (shifts in factories and hospitals);

(g) By place (different geographical areas that are served).

[59] An entirely different distinction, which cuts across the principles mentioned below, is that between hierarchical organization structures and network organizations.

256. Approaches (a) and (b) are particularly relevant for statistical offices. Item (g) is also relevant, but was already described in Chapter III (regional decentralization). Some of the other alternatives (c), (d) and (e) may be relevant for certain parts of statistical organizations, but can hardly be seen as major guiding principles.

257. Since the 1970s, when the second (1980) edition of the *Handbook* was under preparation, new trends have emerged that have affected organizations in general. Some of these trends apply more particularly to statistical offices. Among the general trends, those of particular relevance are the following:

- A need for greater flexibility to respond differently to different situations;
- Fewer detailed rules and procedures;
- Greater autonomy and encouragement of initiative;
- Fewer levels of management;
- Workers empowered to make decisions;
- Cross-unit team structures, project teams, matrix organizations, networks;
- Outsourcing and downsizing;
- Increased budgetary pressure.

258. For statistical offices in particular, relevant trends include:

- The need to improve timeliness;
- The need to reduce the reporting burden;
- An increased focus on rapidly changing user needs and therefore on customized dissemination methods.

259. In addition, dramatic increases in decentralized computer power, as well as related developments in telecommunication have also affected the organization of statistical offices. Most of all, these technical changes have affected the response to the trends mentioned above.

B. Organization by subject or by function

260. The relevant sections in the 1980 *Handbook* focused on two recognized ways of structuring a statistical office: by subject matter and by function. The term "subject matter" is ambiguous and has several connotations. It may apply to the institutional source of the basic information that is collected. Education statistics, for example, would be classified on the basis of the source from which the statistics are collected: all statistics collected from educational institutions, including their finance data for example, would

be the responsibility of the education division. The "knowledge base" of that division would consist of all the information pertaining to the educational system. An alternative interpretation of subject matter centres on main categories of data. This interpretation leads to such groupings as employment and unemployment, finance and investment. However, the most common interpretation of "subject matter" versus "function" leads on the one hand to the creation of divisions such as trade, industry, health and education, and on the other hand to divisions such as sample survey design, data entry and data editing, field operations, analysis and dissemination.

261. For a variety of reasons, some of which are described below, it has always been difficult to make a clear-cut choice between subject matter and function. Accordingly, the structure of most statistical offices is a mix of the two. Some functions are ideally suited to be grouped into agency wide functional units, such as sample design and field work. Other functions, such as questionnaire and publication content and analysis/interpretation generally require the direct involvement of a subject-matter specialist and should therefore be assigned to subject-matter units.

262. Two additional requirements have come to the fore more recently:

- Data collection should be organized as efficiently as possible in order to minimize the burden for both the respondents and the collecting agency and at the same time enhance timeliness;

- Statistical information should be disseminated in a manner relevant to the problems or questions that it addresses; implying that dissemination should be user-focused rather than based on statistical sources and processes.

263. The above two requirements could give rise to two different organizational structures within an agency: one for data collection and one for data dissemination. In order to "connect" the two structures, a bridge is required; this would take the form of a unit in charge of re-sorting data, after they have been collected and edited, into new groupings that better lend themselves to analysis and dissemination. This aspect of organizational design applies to a statistical agency of any size. Naturally, smaller agencies can adopt more flexible solutions.

264. To summarize:

- In theory, there are many organizational approaches that one could use to structure statistical offices;

- In practice, most statistical offices have been organized according to either subject matter or function but usually according to some combination of these two;

- New organizational trends have affected all organizations, and some of them are specifically relevant for statistical offices;

- Among the new developments is the realization that statistical offices may be organized in two other ways: for data input according to data source and for data output according to user categories, with a bridge in between for re-sorting.

265. The difficulties involved in finding the right organizational structure are illustrated by the brief case history in section C. below.

C. Organization and reorganization

266. Before 1974 the organizational chart of the Central Bureau of Statistics of the Netherlands (CBS; now Statistics Netherlands) was simple: a director-general, a deputy, a director for coordination and about 20 departments, most of them subject-matter oriented, but a few constituted along functional lines (including a large department for computerized data processing). Some departments were subdivided into divisions. The story of the reorganization of the Bureau is presented in box 9.

Box 9. Reorganization of Statistics Netherlands

In 1973 the government announced a plan to relocate the Central Bureau of Statistics to a city (Heerlen) at 200 kilometres from The Hague (the administrative centre of the Netherlands), in order to create government jobs in that part of the country. This caused turmoil, not only among CBS staff, but also among other stakeholders and in political circles. The director-general resigned. After some time, a compromise was reached whereby only half of the Bureau would relocate, and its resources would be substantially increased partly to compensate for inefficiencies, partly to tackle new statistical work, and partly to create new employment. In addition, a new organizational structure was developed.

The new structure regrouped statistical departments into four directorates:

Economic statistics (12 departments)	Essentially: subject matter grouping
Social statistics (nine departments)	Essentially: subject matter grouping
Methods and development (four departments, including the central computer department	Functional grouping
Office services (four departments)	Functional grouping

All departments were subdivided into divisions and subdivisions, and often had two additional layers.

At the same time the number of staff employed substantially increased, from about 1,500 to well over 2,000. During the 1970s and early 1980s, additional increases in staff were allowed. In 1982 the (budgetary) number of posts in the CBS reached about 3,500 (the actual number went up to just over 3,000). Then came the turning point.

From 1982 to 1992 the CBS (and most other government agencies) was forced to cut down its budget and staff numbers. Cuts in the early 1990s reduced the number of staff to around 2,500. Overall, the Bureau managed to keep most of its statistical output intact, thanks to effective computerization. In the early 1990s it had one of the largest and most advanced computer networks in the country: about 2,500 personal computers in local area networks, with high-speed connections between the Voorburg and Heerlen. Moreover, efficient software (including *Blaise*) for data collection, data editing and data dissemination was developed.

Despite the budgetary decreases, the demand for statistics increased, largely propelled by demand from the European Communities. Around 1992 the situation reached the point at which the increases in efficiency could no longer offset budgetary cuts. This created tension. The Central Commission for Statistics, which decided on the Bureau's programme of work, had great difficulty in establishing priorities. Several important users (e.g., ministries) became dissatisfied.

In this situation, CBS management tried a "pre-emptive strike" and launched "Operation TEMPO", which stood for:

TIMELY – EFFICIENT - MODERN - PROFESSIONAL - INDEPENDENT

The main focus of TEMPO was external: input coordination to minimize response burden and output coordination to maximize user satisfaction.

An analysis of the situation made it clear that the problems consisted in the following:

1. Problems that were created by external factors, including: increasing demand for statistics; decreasing budget; consequent need to improve efficiency; tension between European and national requirements; pressure to reduce the response burden; the need to improve presentation and public image; the need to improve timeliness; the need to improve public image;

2. Problems that were caused by internal factors, including: too much compartmentalization and specialization; too many layers and poor internal communication; unclear responsibilities; complex internal rules and procedures; excessively inward-looking culture; low self-esteem; and bureaucratic management attitudes.

Once these problems had been identified, the organizational structure was completely transformed. The top management of the Bureau would consist of the director-general and two policy directors (including the deputy). There would be eight directorates: four for statistical production and four for support. The first of the supporting directorates was for input coordination and was responsible for such activities as the business register, data collection from households and the development of electronic data interchange (EDI). The second was for output coordination, including the development of a central database for overall dissemination purposes, integration of information (including national accounts), general publications and marketing, and public relations activities. The third supporting directorate was responsible for basic statistical infrastructure (including methodology and computer services) and the fourth for general office services. Financial and human resource management were placed in a staff directorate directly under the director-general, who in addition was assisted by a small cabinet responsible for international relations and legal and policy matters, as well as for providing the secretariat of the Central Commission for Statistics.

The four directorates for statistical production were organized on the basis of a combination of principles, of which subject-matter coherence and relations with "market segments" (both in terms of users of information and of suppliers of basic information) were the most important. These four directorates were responsible for the following areas:

(a) Agriculture, manufacturing, environment, energy and technology;
(b) Trade, transport and commercial services;
(c) The public sector and well-being of the population;
(d) Demography, labour, income and consumption.

In terms of management, statistical divisions would be fairly autonomous; their performance was monitored by a contract management system. Within each directorate there were 8 to 10 statistical departments. Their internal organization was such that production teams were responsible for the complete statistical process.

In 1999, the government announced plans to close down the office in Heerlen, as well as once again to reduce budget and staff numbers drastically. Another turbulent period followed. Again, a compromise was reached. The Heerlen office remained open, but the CBS was asked to implement a plan to reduce further reduce the number of staff.

This meant another fundamental reorganization, although one with a quite different perspective: while TEMPO was induced by the need to strengthen the Bureau's orientation towards clients and respondents, the new reorganization was pushed by the task to further reduce cost and improve efficiency. Hence, this time the focus was on the streamlining and standardization of processes.

The organization of statistical processes was, therefore, restructured from a subject-matter to a process orientation; production units were integrated and subsequently segregated according to their stage in the statistical process. The movement towards integration led to the reduction of the number of statistical directorates from four to two: one for business statistics, and one for social and spatial statistics. Within each of these directorates, separate departments were established, for data collection and administrative editing on the one hand, and for statistical editing and analysis on the other hand. As a result of the geographical separation between Voorburg and Heerlen, there is one department of each type in both locations.

In this design, a separate input directorate was no longer necessary and in any case external data sources for persons and for businesses have little in common. Conversely, the output directorate (macroeconomic statistics and dissemination publication) was maintained, and its responsibility with respect to publication and dissemination was even strengthened: all data produced by the statistical divisions would be published by the output division, which also accommodated the central information service.

The directorate technology and facilities completed the division structure. To ensure close cooperation between technology, methodology and production, a substantial part of its information technology (IT) and methodology staff was operationally assigned to the statistical directorates.

Supervision of the four directorates and twenty departments was placed in the hands of the executive board, consisting of the director general and his deputy, who would be in charge of statistical policy and processing. Together with the directors of the four directorates, they would form the management committee.

This new process-oriented structure is heavily supported by advanced information technology tools. In fact, large databases account for a clear demarcation between the various stages in the statistical process:

Data collection departments and data analysis departments are delimited by a database containing consistent source data at the micro-level; these data are the inputs for statistical editing and analysis;

Data analysis departments on the one hand, and the publication and integration departments on the other hand, are delimited by a data base containing consistent statistical data at the micro- and aggregate levels; these data are the inputs for the integration and tabulation processes.

Finally, it should be stressed that the integration of processes, in addition to leading to more efficiency, represents a major step towards the long-cherished goal of presenting a coherent picture of society in the form of consistent figures.

Postscript

It is difficult to assess the necessity or indeed the costs and benefits of the organizational changes that Statistics Netherlands has implemented over the years. Clearly, any major reorganization may generate fresh ideas and gains in efficiency, and lead to a better focus on strategic objectives. The process, however, is also energy consuming and jeopardizes continuity. Many statistical agencies innovate, improve their efficiency and rethink their strategies without major organizational changes.

The last reorganization of Statistics Netherlands, however, intended fundamentally to restructure the primary process and thus to produce substantial efficiency gains as well as integration, doing away with existing stovepipes for separate statistics. It is difficult to see how this could have been achieved without a major organizational change.

267. Newly appointed heads of statistical agencies may wonder whether the organization that they have taken over is the most efficient and effective one and whether changes in structure ought to be made. Likewise, long-serving chief statisticians may at some point in time realize that the circumstances have changed so much over time that there is reason to consider a possible reorganization.

268. Before any major reorganization is initiated, it is wise to think at least twice, because of the risks and costs involved. There are also some general considerations to be borne in mind. They are expressed below as maxims:

- Don't make changes to accommodate every valuable new idea; this creates confusion and uncertainty;

- Organizations are not mechanical structures that can be simply re-engineered to meet new sets of circumstances; instead, they are living organisms and tend not to perform well when they are restructured along totally unfamiliar lines;

- Organizations are not ends in themselves; they serve to facilitate, and they must accommodate traditions and, most of all, talented people;[60]

- Undue changes in top management personnel may antagonize staff and create factions;

- While efficiency is an important concern, some overlap in responsibilities and even some redundancy cannot always be completely avoided without running the risk of overlooking important matters; obviously the overlap should be minimized;

- The organizational chart should be simple and easy to explain to insiders and outsiders; if it looks complicated on paper, it will probably also be complicated in practice;

- It is advisable to limit the number of hierarchical levels (four is widely seen as the maximum) because messages tend to get distorted as they are transferred from one level to the next; at the same time, however, the span of control of supervisors should remain manageable (ten professionals is probably the maximum number to manage, although for production staff the number is appreciably higher);

[60] See the 1980 *Handbook*, p. 7: "It is worth recalling …that organizational structures are but shells…In the last analysis what is really decisive in the life and growth of an institution is … the calibre and suitability of the people that comprise it".

- If a reorganization is unavoidable, keep the reorganization process as brief as possible;

- Make sure that the views of all staff members are heard;

- The reasons for any reorganization should be made perfectly clear, because people resent working within a framework that is not fully understood.

269. While these considerations apply to most organizations, there are also some points that should be borne in mind, as they apply to statistical agencies in particular:

- Much of what statistical offices do is marked by sharp fluctuations in the work flow. For example, for annual business surveys most of the basic data may be received in the second quarter of the year, most of the data editing may happen in the third quarter, and the mailing of questionnaires for the next survey round may happen in the fourth quarter. To even out the work flow it may be a good solution to combine this work with tasks that have another seasonal pattern, such as short-term data collections, in order to form a single organizational unit. A more drastic approach is, of course, to look for an agency-wide solution;

- For certain activities, particularly those that affect corporate identity, it is important to aim at strict agency uniformity, and these activities should be placed under unified control in one organizational unit. The agency stamp of approval is important because it assigns quality and conveys integration. Therefore, products (including questionnaires and electronic products on the Internet) should have a common look and feel; control of their design should preferably be centralized;

- In times of decreasing budgets, statistical offices are sometimes confronted with the question of whether or not it is financially efficient to outsource certain functions and, if so, which services can responsibly be bought outside. Catering, janitorial services and security; in many cases, printing; and sometimes part of the dissemination activities are likely candidates for successful outsourcing. Some more general (e.g., basic computer skills) as well as some highly specialized types of training (e.g., management training) can often be easily bought. Much more controversial is the outsourcing of interviewing; apart from the quality issues that have to be considered, few commercial interviewing agencies seem to be able to compete, price-wise, with the agency's own fieldwork staff. Finally, a very controversial issue concerns the extent to which certain computer services should be bought or self-produced.[61]

[61] One example of successful outsourcing of routine computer network maintenance is to be found at Statistics Sweden. See chap. VIII for a fuller discussion of outsourcing of information technology.

D. Coordination mechanisms and corporate culture

270. In all organizations, a sufficient degree of coordination (and not only statistical coordination in a narrow sense, as described in chapter II is a must. While in smaller statistical offices, coordination may be achieved through mutual adjustment, and in larger offices through direct supervision, there will also be a need for standardization, agency-wide, of processes, outputs and skills.

271. Even more important, although it is a difficult topic, is the creation of a strong corporate culture: shared beliefs, values and norms. A strong system of internal communication, through such mechanisms as newsletters, the Intranet, periodic meetings of the chief statistician with senior and middle-level managers and even rotating selections of all staff), may help to achieve this. A seemingly trivial but in principle very functional technique in creating a corporate culture is for senior managers to visit the work floor regularly.

272. Among the more formal mechanisms to coordinate and promote corporate culture, a well functioning system of committees is perhaps the most important and effective. The following sections review the role and workings of such committees. A distinction must be made here between committees and task forces or project teams. The latter serve to deal with specific, finite problems. Committees usually have a more permanent character and serve to address long-term or recurring issues.

273. The 1980 *Handbook* identifies the following as sufficient justification for the creation of a committee:

- Improving across-the-board communications and increasing the sense of participation in collective initiatives;[62]
- Mobilizing agency-wide support for new and high-priority tasks;
- Ensuring multidisciplinary contributions to a new and complex undertaking;
- Maintaining a balance of different interests and perspectives when new methods, standards or concepts are introduced.

274. On the subject of structuring a committee required for effective management of a statistical agency, chapter I, Section D of the 1980 Handbook states:

> "Indeed, it is, or it should be, one of the constant challenges of top management in a statistical agency, irrespective of its pattern or organization, to keep the horizontal dimension alive, visible and effective". [63]

275. It is safe to assume that a sizable agency (i.e., over 500 employees) will reflect in its organizational structure both subject-matter and functional units. As a result, there will

[62] See 1980 *Handbook*, p. 11.
[63] See 1980 *Handbook*, p. 10.

be points of internal tension for which some form of mediation is required. An example of this would be an agency in which both the department in charge of industry statistics and that in charge of health statistics have the required funds to pay for the computer processing of their latest data. Monthly, conflict arises over which department takes priority, as does the risk that one or the other will miss a scheduled release date. The chains of command of the two departments meet only at the very top. It becomes necessary to devise a system that reduces tension, forecasts events and standardizes the manner in which future conflicts arising from this kind of situation are resolved. The 1980 *Handbook* points out that horizontal mechanisms must be put in place to resolve conflict and promote integration in any organization with separate units. Such mechanisms are known as horizontal committees. Some statistical agencies have a complex network of committees, some standing and some ad hoc, all created to promote an overriding objective and to minimize inevitable tensions.

276. The influence of a horizontal committee depends on whether the statistical agency wants to maintain its established hierarchical flow of information, or wishes to introduce a second source of advice and information specialized issues that are agency-wide rather than limited to a single organizational unit. In the case of the latter, the committees may become as powerful as the regular units listed on an agency's organizational chart.

277. There are essentially two kinds of internal committees,[64] those that deal with managerial issues and those that deal with technical ones. Certain statistical problems exist irrespective of the good will of participants, the soundness of the agreements reached by them and the quality of basic statistics. For instance, in those countries where there are estimates of quarterly national accounts, issues inevitably arise from the nature of the basic statistics and resulting inconsistencies when the accounts are first compiled. Where there exists a central register of businesses, classified according to their economic activity, subject-matter experts should take part in agency-wide discussions to ensure that different surveys do not end up with overlapping populations.

278. Management issues such as the recruitment of professionals; the provision of general training for all classes of staff; and the standards for dissemination when different parts of an organization contribute to the same publication all require open discussion and review of internal protocols. These matters are of consequence to both large and small organizations, but in the case of smaller organizations, the formality and size of committees decrease substantially.[65]

279. One important committee, essential in instances in which the statistical agency's staff is unionized, concerns labour-management relations. In many situations, the chief statistician needs a direct conduit to the staff, just as staff members need direct access to the agency executive. The nature of such a committee's agenda depends partly on which elements are handled on a government-wide basis and which are left for each agency head to solve.

[64] An explanation of external or advisory committees can be found in chap. II above.

[65] In the case of Statistics Switzerland - a medium-sized statistical agency - there are standing committees covering such subjects as the consumer price index as well as ad hoc committees formed to deal with unique problems as they arise.

280. The following remarks address those concerns requiring regular attention. Issues resulting from a temporary increase in interest justify the creation of a task force rather than a committee and are not seen as crucial to the organization of the agency. The elements required for a task force to operate successfully, however, are much the same as those necessary for the functioning of a standing committee.

281. Typically, committees do not have a budget. Their power is a result of the respect they are given by the rest of the organization and the established practice of resolving cross-cutting issues by committee. Still, committees have minimum requirements - a chairman, a secretary, an agenda and rules on membership. The chair should be a capable and impartial leader whose judgement should be respected, even though his/her statements do not carry the weight of an official decree. The committee's purpose is to advise the chief statistician. While the chief statistician has the power to ignore the committee's advice, in practice, and possibly with slight modifications, the committee's voice will be heard.

282. Committee recommendations should be recorded. These decisions, together with a short account of the reasoning behind them, should be open to inspection by the rest of the staff. For large offices with a comprehensive internal system of communications, all of the committee's agenda, deliberations and records of decision should be posted on the agency Intranet. As an organizational rule, while the committee's recommendations are not reached by consensus, staff members should always be privy to the committee's decisions.

283. Committee membership offers an opportunity to contribute to agency-wide policies. Such activity also serves as a training ground for future senior managers in the sense that it provides members with a broader perspective than they could acquire from their regular jobs, and makes them aware of the wide range of considerations important to the agency. Committees must not grow too large, or else they become cumbersome and incapable of reaching closure on the issues they debate. Generally, committee meetings lasting over two hours represent a heavy burden on their members' time. In order to maximize the training benefits that such committees confer on their members, some system of membership rotation should be adopted. One possibility is for members to serve on a committee for a mandatory period of two years, extensible by one year, after which they move on. Inevitably, an informal ranking of committees by their perceived influence or prestige will be established. Determination of membership should acknowledge prestige and ensure that those managers who show promise serve on committees with the most critical agendas.

Conclusions

Organizationally, there is no "ideal" model. In practice, most statistical offices have been organized according to either subject matter or function, but usually according to some combination of these. Moreover, it is possible to organize statistical offices in two other ways: for data input according to data source or for data output according to user categories.

Before initiating any major reorganization, it is wise to exercise caution. Some of the general considerations to bear in mind include:

- Don't make changes to accommodate every valuable new idea; this creates confusion and uncertainty;
- Organizations are not ends in themselves; they serve to facilitate and they must accommodate traditions and, most of all, talented people;
- While efficiency is an important concern, some overlap in responsibilities and even some redundancy cannot always be completely avoided without running the risk of overlooking important matters; obviously, the overlap should be minimized.

VI. MANAGING STAFF

284. Nothing is as important to a statistical agency as its staff, for the difference between a well-organized, strongly motivated and technically competent staff and one that displays these attributes only to a very modest extent is the difference between a good and credible office and one that is second-rate. Expenditure on staff accounts for a dominant fraction of the budget in a statistical agency. In a sample of offices representing a broad array of sizes and stages of development, salaries accounted for approximately 70 per cent or more of the total budget. In addition, heads of agency tended to devote more time to staff problems than to any other issue.

285. Improvements have been made in "people management" in bureaucracies in general and in statistical agencies in particular. Management of human resources is acknowledged in discussions in international venues as having been taken for granted in earlier times, and is now perceived as critical. Also addressed in such discussions are the various stages of training and the need to retain and develop staff, as well as the considerations that determine how specialized the agency staff should be.

Box 10. Staff and skills

Chapter VIII of the 1980 *Handbook,* [a] makes the following observations concerning staff skills and training:

- A decisive factor in the internal capability of a statistical agency is the calibre of its staff. An agency can only function well if good people are available to make it work. Organizational arrangements may contribute to enabling good people to do their best; but it is essential to give utmost attention to building up the right kind of staff in organizing and managing a statistical agency;
- To acquire the kind of skills needed, a statistical agency must have a well-planned policy and active programme of recruitment, career development, education and training;
- In addition to the personnel unit, other units of the administrative branch should be involved in carrying out the personnel policy. The acquisition and maintenance of adequate office space and equipment can contribute not only to efficiency but also to the well-being and satisfaction of the staff. Moreover, suitable accommodation, facilitating ready communication between people working in related fields, is conducive to the integration of statistics because, in a real sense, the "successful integration of statistical end-products is contingent upon the 'integration of the statisticians' ";
- After some time, when a minimum of experience has been gained, every employee should be obliged to attend an orientation course where further explanation is provided;
- Officials of the personnel unit should teach the introductory course for employees at lower levels [management should teach professionals]; the establishment of good personal relationships between this unit and the new employees is of great importance;
- The in-service education and training described above requires not only teaching but also quite extensive administrative efforts. Therefore permanent machinery should be established in the form of an

in-service training school. In a small or medium-sized agency, a part-time head of the school may be selected from among the best qualified professionals of the agency. In a large agency, a full-time head may be needed. Such machinery is necessary to ensure the proper design of courses, recruitment of teachers, selection of students, etc.

[a] *Handbook of Statistical Organization: A Study in the Organization of National Statistical Services and Related Management Issues,* Studies in Methods Series F, No. 28 (United Nations publication, Sales No. E.79.XVII.17).

A. Staff composition

286. As a percentage of the total staff the share of professional and technical components has increased substantially even in cases where actual numbers have dropped and relative resource endowments have not kept up with changes elsewhere in the civil service. In some statistical agencies (at least in Organisation for Economic Cooperation and Development [OECD] member States), professionals account for one in two staff members. Statistical surveys have become more sophisticated, at least in terms of planning, and general expectations regarding the quality of the estimates produced by statistical agencies have risen. The computer and communications revolutions and the resultant gains in labour productivity have surely contributed to these trends. One of the many results of these changes is the impact on the human resource policies adopted by, or imposed on, statistical agencies. These policies, which were still in the developmental stage 20 years ago, appear to have evolved fully in many agencies and should therefore be open for study by statistical offices that are still undergoing structural changes.

287. The staff of a statistical agency is not made up solely of statisticians. However, in the case of the chief statistician, it is a common practice – although by no means a rule – to select someone with strong credentials in statistics. Regardless of the appointee's other virtues, a demonstrated mastery of statistics will tend to inspire confidence on the part of the public.

288. Owing to the range of subjects covered by a modern statistical agency, the staff tends to possess a variety of skills and academic backgrounds. Even agencies that conduct only moderately complex and specific statistical undertakings find themselves in need of a wide range of skills. Statistical operations require a mix of talent, including economists, sociologists, demographers, econometricians, model builders, geographers, anthropologists, criminologists, engineers and computer experts.

289. Some of these skills are not required for day-to-day statistical operations,[66] but they prove essential when new operations are being planned and launched. Naturally there is a certain amount of learning and technology transfer that makes the staff of statistical agencies more versatile, but in the end medium-sized and large offices will find

[66] Even so, there are well-established statistical operations that do require the almost daily intervention of very specialized knowledge. Nothing could be better established in the majority of government statistical agencies than the consumer price index. Yet maintaining detailed specifications of goods and services priced every month or every quarter in the face of technical and institutional changes demands a knowledge usually possessed by a wide variety of specialists. Thus, offices may require at least the frequent advice of civil engineers; telecommunications, radio, and television specialists; and banking and insurance operators.

that there are limits to what can be borrowed from other countries and other institutions and will therefore choose to enhance their own capabilities.

290. It is important to build a multi-talented staff with a broad range of academic skills and work experience. The factors that dictate the balance of skills required from the staff in an effective statistical agency are presented below. As in many other situations, the question arises whether certain capabilities are used so often that they should be available to the agency on a permanent basis or whether, given the expected usage, it is sufficient if they are acquired if and when their use demands it. This holds true for human resources as much as for equipment. For example, when adapting an international classification to suit national purposes, growth in demand for very specialized knowledge relating to such areas as chemicals, electronics, pharmaceuticals, computing, the audio-visual industry and financial services will be inevitable. Likewise, international trade statistics require specialized commodity knowledge as well as knowledge of national customs administration processes. These are examples of requirements that tend to be in demand when new methods are introduced or new classifications are instituted. In such cases, an agency may choose to employ the services of a specialist, through a consulting contract or some other non-permanent association.

291. The more general the capabilities sought, the easier it is to administer and maintain them. Moreover, general capabilities have a versatility that agencies, particularly the smaller ones and those that have not yet fixed a medium-term agenda, find attractive. General training can be provided formally; it creates the basis for a shared culture and predictable performance; and it can more easily be supplemented by specialized training as staff members move from one job to another.

292. Professional staff can often be divided into two categories:

- General personnel capable of performing at lower and intermediate levels of sophistication in the areas of computing, statistical design and analysis, national, public sector or enterprise accounting, and economic, social or demographic analysis;

- Specialized personnel capable of performing at a substantially higher level in an area such as non-response analysis or in a field such as analysis of geographical information, criminology, or health statistics.

293. In the event of some major undertaking, this staff structure can be augmented by the occasional purchase of services provided by consultants, national or international, who are highly specialized or concerned with matters of policy and public perception.

294. Once a determination has been made as to the size and the composition of the permanent staff and those obtained through short-term contracts, the chief statistician will

evaluate supply and demand and attempt to correct any imbalances through recruitment policies. [67]

B. A human resources policy

295. Irrespective of its composition, the workforce of a statistical agency is its most precious resource, and as such it must be treasured. An effective statistical agency will manage its staff with the help of an explicit set of policies. The most important elements of a personnel (human resources) policy include the following:

- Ability to ascertain personnel needs;
- Standards and techniques for recruitment;
- Deployment of personnel;
- Introductory training;
- Monitoring equity in recruitment and in career advancement;
- Intermediate training;
- Career development and job rotation;
- Training for managerial functions;
- Staff motivation and retention.

296. These elements are listed in the approximate order in which they naturally arise. Certainly, other features could be added, but these are sufficient to support a policy with common objectives. The following is an example of a set of coherent objectives that the elements listed above are designed to help attain:

- Increase the proportions of professional staff by expanding the annual intake of young professionally qualified staff;
- Ensure that once recruited, qualified people are assigned suitable jobs and everyone is treated fairly;
- Devise a proper mixture of deterrents and incentives, to be made explicit to the staff;

[67] Some of the larger statistical agencies have an explicit personnel forecasting model, designed primarily to consider the hierarchical level of the incumbents and match it to their demographic characteristics. The model is used to forestall undesirable imbalances in the hierarchical (more than in the professional) structure.

- Administer sufficient training to staff members at key points in their careers, so as to maximize versatility and motivation;

- Ensure that key jobs are staffed and have a possible successor ready to step in to an incumbent's shoes should the need arise.

297. To facilitate a discussion of ways in which these policies can be administered, four internal institutions should be examined:

- The office of human resources;

- The personnel committee;

- The in-service training facility;

- The evaluation machinery.

298. The office of human resources and the personnel committee assess needs, recruit and deploy staff, formulate retention policies and ensure equitable treatment. The in-service training facility, as its name suggests, oversees training. Finally, the evaluation machinery fields questions regarding the adequacy of these mechanisms.

299. The 1980 *Handbook* suggests that when a statistical agency reaches a certain size, it should invest in a professional human resources office. However, experience shows that while such an office is essential in dealing with the administration of all or most human resources policies and with advising on the development of such policies and instruments, it seldom plays a decisive role in detection, evaluation or persuasion, all of which help to ensure that talented people come to work for a statistical agency, that the agency's stock of people gets renewed as often as required, and that there are incentives to retain the best employees. This finding, while seemingly critical, merely recognizes a simple fact: a professional office of human resources will primarily administer public service acts, enforced in most countries, that regulate the conditions of recruitment and employment in the public sector.

300. Cases in several countries have also shown that the most successful formula for the management of personnel issues is one in which the subject matter staff are intimately involved with such personnel processes as recruitment, training and retention. The heads of personnel units are the advisers best qualified to validate suggested personnel approaches and policies. They are also the best person to execute policies once the choices are made and the policies in question defined.

C. Recruitment

301. Often, ministries such as planning, treasury, industry, employment, agriculture and transport, agencies such as central banks and stock exchange commissions, and comptrollers' offices will draw recruits from the same pool as the statistical agency. In most countries, initial and subsequent salaries in the statistical agency are relatively low compared to the central banks. Moreover, in some developing countries this inequality

also holds between the statistical agency and other ministerial agencies. For this reason the statistical agency should develop a recruitment plan, including attractive items such as:

- Impressing upon them that professional work tends to be more rewarding in a non-political environment such as that maintained by the statistical agency;

- Appealing to the competitive instinct of recruits by promising them that merit will be used to militate against the more onerous aspects of seniority rules in their promotion prospects;

- Giving recruits intensive and marketable training of a practical nature either directly or by agreement with a teaching institution;

- Striving to send young people to acquire training abroad as soon as they prove themselves ready.

302. All this is subject to the constraint that the statistical agency should refrain from recruiting rather than deliberately recruit the mediocre. The personal involvement of the chief statistician in these matters can help transform a potentially mechanical and not very fruitful approach to young applicants into one filled with prospects and enthusiasm.

303. Young people who decide to go into public service are often drawn to the possibility of working on policy analysis. The opportunity to be in the proximity of those whom they perceive as the makers of the nation's destiny is an unrivalled attraction. However, the work of a statistical agency is less glamorous. This creates a problem for the agency. Not only does it add to the difficulty of enticing top graduates, it also makes it more likely that, if recruited and given specialized training, these graduates will move on to more prestigious centres of Government. Furthermore, once economists and social scientists start working for other government agencies, the possibility of getting the brightest back to a statistical agency is not high. For this reason, statistical agencies must accept the cost and the risk of recruiting young people with no experience, forge suitable training policies and stick to them in the knowledge that they face inevitable high rates of attrition, particularly among the non-statisticians.

304. A great number of careers are open to young people with an ability for quantitative analysis, promising greater incomes and a faster rise to higher monetary rewards than anything the chief statistician can hold out for them. It is very difficult for a statistical agency to compete with the private sector on initial or prospective salary. However, statistical agencies should be looking for those who are searching for more than salary. Those who may be more successful in the Government in general and in the statistical agency in particular would join the organization because they wish to have a job with a higher moral purpose, which is the public interest. Nevertheless, as we have mentioned previously, it is often difficult for the statistical agency to compete with other governmental agencies on the lookout for the same kinds of talents. Mitigating this situation is the fact that, for those who have graduated in mathematics with special reference to statistics, and who do not wish to teach or be an actuary but are interested in

mathematical applications to sampling, statistical design of experiments, hypothesis testing and related areas, the statistical system presents the most interesting challenges. The statistical agency should make it a priority to find professionally interesting work for such employees as soon as they join the agency. In addition, it is probably easier as a matter of practice to get young statisticians to stay with the statistical agency by broadening their interests so that they extend to economics and social organization, rather than expecting economists and sociologists to extend their stay for the sake of interesting issues in the theory of measurement.

D. The first day

305. In official texts on organization, little if anything has been said about a new employee's first day in the office. Yet the first day (or the first few days or the first week) can have a pronounced effect on the recruit's attachment, respect, and dedication to the organization. If the statistical agency is just another government agency, it will not be able to compete with more prestigious areas within Government. It will have neither the cohesive and elite forces binding foreign service officers together, nor the high-profile work that characterizes the business of analysts working on macroeconomic policy. The strengths of a statistical agency lie in its capacity to allow long-term pursuits to be entertained in an atmosphere relatively free from political turmoil and totally free, one hopes, from successful political pressures. Those strengths can be cemented in a recruit's first few days and converted into loyalty to the office.

306. An effective statistical agency will ensure that the following take place on the first day:

- The new recruit finds an agreeable place in which to sit and something definable to do;
- An accessible person is identified who will address questions and resolve doubts for the recruit; [68]
- The organization conveys its willingness to consider the individual's career in addition to the immediate job;
- An explanation is given of what the individual's activities will be in the immediate and the near future, how they fit in with the organization of the office and what specific objectives they are designed to serve;
- A training plan is presented;

[68] In some agencies there are two such persons: one is an immediately defined supervisor who is responsible for the day-to-day administration of the recruit's work and performance. The other, acting as a "mentor", is responsible for the recruit's adjustment to the new workplace, for the resolution of longer-term questions and doubts, and for the discussion of supplementary skills that the candidate may wish to acquire as a means of career development.

- Orientation is provided. Some offices, usually larger ones, have developed a tradition of organizing, at regular intervals (e.g., every month or every second month) an orientation day that is meant to give new recruits a quick overview of how the organization is structured and operates.

Box 11. Use of the Intranet and the first day

The first day has become an incomparably easier affair to manage with the institution of the Intranet. For example, the recruit's office is equipped with a personal computer and a modem. There he/she finds a personal greeting from the chief statistician; the text of the law that rules their agency; the structure of the organization, complete with the names and telephone numbers of key people; extracts from major publications; and, usually, a thriving exchange of messages among staff members that range from private sales of cars or audio equipment to serious discussions of methodological problems. Even if a personal computer and a modem were not available, a printed guide with the above material would still be of value.

E. Training

> "The supply of professionals with the skills required in a statistical agency is as a rule scarce….Frequently the progress made by new staff members is slow because they do not know the characteristics of the agency sufficiently well….After some time, when a minimum of experience has been gained, every employee should be obliged to attend an orientation course where further explanation is provided…" In many countries, the knowledge acquired in universities, both in subject-matter fields and in statistics, is often too general and abstract to be immediately well adapted to the needs of statistical agencies….Developing countries have access to regional institutes of statistics, sponsored by several countries, which a statistical agency should take advantage of".[69]

307. Training should be regarded as an ongoing activity. In fact - without going so far as the armed forces, where a promotion to a new rank is viewed as the beginning of a training process that will lead to the next promotion - training should be a continuing activity.

308. Since the 1980 *Handbook* appeared, there is no denying that the demand for training has increased. Generally speaking, the statistical process has become increasingly complex. Traditional on-the-job training methods, while indispensable, are not the most effective way to ensure versatility of skills and standardization of methods. Furthermore, training facilities for developing countries seem to have diminished as a result of insufficient budgets and the lack of available trainers. In addition, the demand on agencies to produce accurate and timely statistics has increased. These concerns make the choice of training methods, particularly for more experienced, specialized statisticians, a crucial issue.

309. While there are different ways to provide career-long training, one way that has proved to work in many countries is to consider general-purpose training as having three distinct cycles:

[69] 1980 *Handbook*, pp. 42-43.

- The introductory cycle: this is primarily designed for newly recruited staff, and its purpose is to ensure their speedy integration into the organization, which implies both becoming familiar with the traditions of the statistical agency and being able to make a contribution in any of the domains or functions within its scope. Virtually all agencies administer such training, even if they do so in the most informal manner; [70]

- The intermediate cycle: this training cycle is designed primarily for those who have worked in a statistical agency for a period of five to ten years and who have not had an opportunity to refresh their skills;

- The administrative cycle: over the course of a staff member's career, its direction eventually becomes foreseeable. Those who have the potential to fill policy-making positions within their respective agencies should be trained in the subjects that will demand their energies once they reach management levels. These subjects include financial administration and control, large project management, marketing, the institutional set-up of the Government and other features of the environment external to the statistical agency.

310. Moreover, one should make the corresponding cost part of the agency's regular budget and administer training to all targeted staff members as a matter of course. However, such training is regarded as general purpose, and it is not sufficient. It should be complemented by more narrowly defined courses to meet specific short-term needs. Many offices are not in a position to provide courses at all or at any of these levels. This is why alternatives and special arrangements are so important. In general, training can range from the very formal, given in a separate school by qualified trainers and lasting for several months, at the end of which course graduates are awarded a diploma, to an informal series of discussions with senior officers, possibly including the head of the agency.

311. For offices that are very small and newly formed, and where tradition is still being created, the alternative solution may be to benefit from what is available elsewhere: in the offices of better-endowed neighbours or in more advanced statistical agencies in which training modules for visitors from abroad are featured regularly. There are numerous variations on this practice, and the possibility of offering additional courses largely depends on the overall resources of the statistical agency as well as on the time and money it wishes to devote to initial training. Generally, the size of the agency and its endowment will determine the formality and specialization of the courses it offers.

[70] For example, in the United States Bureau of the Census, newly recruited staff were expected to attend a lengthy course, which involved taking a small-scale survey after designing it literally from scratch. The survey was conducted within the groups of recruits, with each member assuming a specialized role (computer analyst, questionnaire designer, sampling error estimator, etc.). Its primary purpose was to instil at an early stage the habit of working in multidisciplinary teams. The idea has been adopted by a number of other countries. In some countries, recruits must complete a range of compulsory courses lasting two to three months, followed by a couple of years of assignments in various parts of the agency, so that they gain a more general perspective on statistical work and the way it is handled while simultaneously contributing to it.

312. The idea of an in-service training institute is almost as old as that of creating a stand-alone statistical agency dedicated to the improvement of statistical methods and compilation and dissemination of social and economic statistics. According to chapter VIII, section F of the 1980 *Handbook*, "… in-service education and training require not only teaching but also quite extensive administrative efforts. Therefore permanent machinery should be established in the form of an in-service training school. In a small or medium-sized agency, a part-time head of the school may be selected from among the best qualified professionals of the agency. In a large agency, a full-time head may be needed. Such machinery is necessary to ensure the proper design of courses, recruitment of teachers, selection of students, etc.".

313. Some countries have such a facility and run it very much in accordance with these recommendations. Other countries have a variety of different arrangements with local universities, in which they share the burden of administering at least the more formal aspects of training. Others still adopt ad hoc solutions and ensure that their junior and intermediate staff are trained abroad, preferably in neighbouring countries or else in a regional training facility.

F. Job rotation

314. An agency's "staff model" may fall anywhere between two extremes. At one end of the spectrum is the "no one moves" model. Its objective is to maximize specialized human capital by allowing staff members to learn more and more about their respective areas of responsibility (e.g., industry; health; education; retailing; balance of payments). Staff members would be expected to have a purely vertical career and would leave their areas only when called upon to discharge agency-wide responsibilities.

315. At the other extreme, the driving principle is versatility. Staff members are encouraged (or required) to acquire the widest possible experience in the shortest possible time by moving from one job to another. When this movement is directed by the office of personnel, it is likely to be in keeping with an optimal pattern so that the acquired experience would provide the most versatility.

316. It is virtually impossible to quantify the many factors that affect how an agency will balance the needs for both specialized knowledge and versatility. For example, staff morale is an important consideration, and if the idea of permanent rotation goes against habits and expectations, its introduction in an extreme form may create negative reactions that outweigh its benefits. Conversely, in a culture where the staff are used to and expect to change jobs every so many years, the absence of opportunities to try different assignments might well lead to frustration and atrophy.

317. Somewhere in between is a point of equilibrium that capitalizes on the inherent strengths of the two extremes. For example, an institution may require that at a certain level no one is allowed to remain on the same job for more than five years; if one opts to keep the same job for an indefinite period of time, it would be with the knowledge that one's chances of advancement are correspondingly reduced, even if job performance is entirely satisfactory.

G. Staff retention

> "Despite the contributions of national, regional and international institutes to the trained statistical work force, critical shortages exist in developing countries. In part, this results from the fact that the demand for statistics has been increasing faster than the available resources. In a more fundamental sense, the shortages reflect the disadvantaged position of the statistical service in many developing countries with respect to pay scales and related working conditions as well as the low or moderate status of the national statistical services within the government hierarchy. Thus the most promising young people do not enter the statistical service as a first choice…" [71]

318. Staff retention is one of the major challenges for every office, whether large or small, well or poorly endowed. The smaller and less well endowed the office, the greater the loss sustained when a talented individual leaves. Several methods of retaining staff are worth exploring but none is foolproof. Ultimately, losses of employees to other offices and to the private sector must be included as part of the expected cost of running a statistical agency.

319. One way to deal with staff retention is simply to accept that no statistical agency can keep its most talented people forever. Accordingly, the best it can do is to procure the services of capable staff for a limited period. It is better to be explicit about this situation, for in this way there are no surprises at the end of the period for which these services are contracted. One tactic is to convince government departments that attract talented professionals with abilities in quantitative analysis that it is in their interest to place such people in the statistical agency for a while, so that they can learn all about the limitations of data and the possibilities of statistical inference. Moreover, such sharing of staff will help the statistical agency sort out its priorities, connect the agencies and create a better basis for ongoing dialogue. Since these features are always valuable, the initial stationing of people in the statistical agency or the ongoing exchange policy could become permanent features of a government-wide personnel management programme.

320. Another way to improve retention is to provide positions of increased responsibility to young and talented people as soon as they have demonstrated their capability. While some risk is involved, it is preferable to retaining staff members of mediocre talent while losing those whose talents are exceptional.

321. Another option is to form a contractual relationship with recruits that will deter them from leaving the statistical agency for frivolous reasons. For example, in offices with structured introductory training programmes, recruits could spend their first year on a particular assignment, after which they would participate in the training programme, provided they have signed up for a stay of at least three to five years in the statistical agency.

322. There are also special programmes that can be developed to ensure that qualified persons are recruited, such as the "cadet" programme of the Australian Bureau of Statistics in which the statistical office pays for the education of talented future statisticians) and internships.

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[71] See 1980 *Handbook*, pp. 43-44.

323. Traditionally the problem of staff retention has been the sharpest for experts in information technology (IT). As the speed of deployment of IT, so did the demand for trained personnel; however, the supply of qualified people did not increase as quickly. In such circumstances, it became virtually impossible for a government institution to compete with the private sector, the banking sector, or companies owned and operated from abroad. Government institutions were not able to offer competitive salaries, and what they could offer - job security - was not an overriding concern for the young and mobile professional with the desired skills. The standard response to this situation, which has shown no great variation in the recent past, was to recruit ever younger, less-experienced technicians and administer training. However, this policy, in addition to consuming resources, converted statistical agencies into an unrecognized training centre for the private sector. As soon as recruits were trained, some other enterprise stepped in, offering to double or triple their salaries.

324. The next chapter will consider in more detail how to manage information technology a statistical agency.

H. Options for a new chief statistician

325. No recently appointed chief statistician - with the possible exception of one in a newly created office - can make more than minor staff changes. Annual recruitment represents only a small share of the total number of employees and is unlikely to make a profound difference in the short term. Most agency heads will inherit a complete team; some will inherit a ready-made team from which the top layer has been removed, as when there is a change of government.[72] Whether or not the existing team is ideal, it is prudent to keep it intact (to do so may also be the only option under the law) and make improvements through gradual additions as well as by taking advantage of voluntary departures and retirements.[73]

326. Occasionally, total resources are increased appreciably because of a special project (e.g., a census or a very complex and costly survey) for which supplementary staff members must be recruited. In such cases, significant staff changes may be made; although this is not the rule, when it does happen experience shows that the risks involved in hurried recruitment outweigh the bad impression created by a sluggish response to an urgent need.

[72] It is typical in some countries to have the top layer of management of a statistical agency tender its resignation when there is a change in Government. In some of these countries, according to its constitution, the president serves only one term. This practice might create a change in direction as often as once every four or five years. Moreover, the management being called up to tender its resignation has just mastered the mechanisms of the system, whereas its successors are unfamiliar with them. The result is that the second level of the staff, or perhaps an even lower level, must take charge of day-to-day operations.

[73] There is little advice that can be given to chief statisticians in a generic way on what to do with the people who are generally perceived to be a liability to the organization. Of course, if they are very disruptive there may be no choice but to engage all the means available by law, regulation and tradition to free the organization from their services. Such cases, however, tends to be the exception. More often, people are on the margin and the chief statistician receives conflicting advice about their value to the organization.

327. A chief statistician newly appointed to run an existing agency may worry about being overly dependent on the existing staff for advice and may be concerned that the staff will take advantage of the situation, perhaps to carry out a pet project, exaggerate a technical difficulty, or add to resources in a less than unbiased fashion. Accordingly, a chief statistician joining an agency may wish to bring in someone he has worked with, whose judgement he trusts and with whom he can discuss options as an alternative to his own immediate subalterns. While this practice may provide a certain cushioning, it may well have the unintended effect of widening the gap between the head of the agency and the regular staff. In fact, the greater the access and the level of the newcomer, the greater the danger of internal rivalry. One device that has been used to signal the transient nature of the appointment is to bring in the newcomers but not as part of the established hierarchy.

I. Human resources management: a package

328. So far we have described the elements of a human resources policy and the factors that affect them. However, makers of policies - chief statisticians, heads of personnel, committees on human resources - are not simply free to pick and choose those measures they believe are required to solve a current problem without concern for the coherence of the resulting set. Policies, in this domain perhaps more than in any other, must reinforce each other in order to be effective. For example, a strong impetus assigned to job rotation can only make sense if versatility is favoured over specialization and general training over on-the-job training. The list below details a possible set of measures and policies applicable to small to medium-sized offices:

- A steady influx of recruits, weighted in favour of those with post-secondary training, with an insistence on computer proficiency and an aptitude for quantitative analysis;

- As heavy an investment in the beginner's initial training as resources permit, fortified if at all possible with out-of-institution or even out-of-country training opportunities for the most talented;

- An agreement with other public sector institutions in which talented young people remain in the statistical agency for a reasonable period of time;

- Promotions based on merit as opposed to seniority, in order to minimize the loss of able staff members;

- Semi-compulsory job rotation in order to avoid excessive specialization, supported by ongoing training to ensure versatility and acquired familiarity with a variety of jobs within the statistical agency.

Conclusions

The most important asset of a statistical agency is its staff. They therefore deserve a policy especially designed to ensure the following:

- Recruitment of the most talented and promising people;
- A selection process that is as thorough and as professional as possible;
- Proper assimilation of newly recruited staff into the statistical agency;
- Satisfactory working conditions, designed to facilitate communications between newcomers and the rest of the organization;
- Personnel administration, which is a necessary activity within a statistical agency, handled in a centralized mode by professionals, albeit not exclusively;
- A special training centre, if justified by training needs, with its own staff and a dedicated (part-time or full-time) professional director;
- Human resource policies that constitute a coherent set. Small and medium-sized offices should be encouraged to choose policies that favour versatility and maximize career opportunities within the office.

VII. MANAGING INFORMATION TECHNOLOGY

329. Much has changed in the twenty years since the matter of capital assets was addressed in the 1980 *Handbook.* Four prominent advances have greatly expanded the capabilities of a statistical agency:

(a) Powerful, relatively inexpensive computer equipment has been made available to all staff members in many statistical offices;

(b) User-friendly applications software has given staff members control over a number of key statistical functions, ranging from questionnaire design to collection, editing, tabulating, mapping and publishing. Readily available off-the-shelf components have made in-house application programming easier, and component reuse within the organization has become more common;

(c) Computer networking has facilitated internal access to data and metadata through established tiered client/server environments;

(d) Information technology has made timely access to external sources of information feasible for staff members, thereby making it possible to conduct research, gather general information and perform other relevant tasks at all levels of an organization rather than solely through top management.

330. These advances and other related changes have given rise to new concerns regarding the management of the information technology environment. The information technology framework includes hardware, software, staff resources and commercial services.

A. Two information technology (IT) management models

331. The present chapter, rather than focusing on the management of particular technologies, will investigate whether there are broader themes that will withstand the inevitable and fast-paced technological changes to come. Thus, for example, such topics as the pros and cons of a client/server model or the optimal network structure within an agency are not considered here. Instead, the reader is introduced to two organizational models that have a reasonable chance of being valid over the next ten years or so. The models are followed by some general recommendations that should be valid independently of particular technological winners and losers.

Model I

332. In model I the statistical agency makes detailed and comprehensive decisions about its informatics infrastructure, which includes both hardware and a common software architecture. The term "software architecture" refers not only to the underlying database management software and consequent standardized definition throughout the agency, but also to the standard user interface, groupware (e.g. products such as Lotus Notes as well as standard naming conventions and archiving conventions), personal software such as spreadsheets, and the integrating tools to "glue" the software together. Some agencies have gone so far as to prohibit private personal file storage on workstations to ensure that no other software except that approved by the central informatics area is found on individual machines. Maintenance, updates and decisions on new software are all determined by the central organization.

333. Since Model I assures one common infrastructure, this approach serves to bind together the organization and prevent information anarchy. It also makes it much easier to integrate different functions of the agency such as registers and cognitive research. However, it may stifle creativity, and parts of the organization may not have the tools they need to perform their functions properly. The success of this model is clearly dependent on the effectiveness of policies and personnel in the central informatics division.

Model II

334. Model II also recognizes the need to avoid information anarchy. This approach relies on standards - hardware, software, and telecommunications - to provide for a coherent informatics environment in the organization, rather than on a standard and unyielding infrastructure. Although at first glance it may seem that this is easier to implement - certainly most staff outside the informatics organization will embrace it because it provides for more local flexibility and decision-making - from a central management view it is harder to implement. In practice, it has proved exceedingly difficult to ensure that new software, even if it meets the standards, will transparently integrate with existing software. In addition, changes to the existing software may cause unforeseen problems in the local new software products. A positive aspect of Model II is that it allows some flexibility and potential adaptation of new software even if the central informatics staff makes decisions that turn out to be shortsighted.

335. Reflected in both models is the general understanding today that software applications should be developed as closely as possible to the substantive user. In the first model all the software tools would be defined, provided and maintained by the central informatics organization. In the second model, although the basic tools and a set of standards to be met would be defined by the central organization, the substantive user would have greater freedom overall in implementing the project. Both models have shown that they can be successful. The choice is often made as much by taking into account the culture of the organization as on technical grounds.

B. Review of some concerns prevalent at the end of the 1970s

336. In the 1970s and early 1980s as statistical agencies tried to integrate mainframe computers into their operations, concerns were very different. A number of recommendations emerged regarding the way the systems analysis workforce should be managed, relations with other government computing establishments and the types of software to implement or to avoid. These recommendations are summarized below:

- Do not squander specialized human resources; they are scarce and must be kept together under central supervision;
- Document all systems extensively;
- Organize the workforce creatively so as to provide both functional and subject matter experience, i.e., balance versatility and specialization;
- Promote training activities by building in on-the-job training.

337. With respect to the first observation, it is still true that specialized informatics expertise is scarce. However, depending on the size of the organization and its levels of decentralization, it may be more sensible to locate some of these resources within the functional areas of the statistical office. Training and staff development should be planned and updated on a regular basis. The importance of documentation cannot be underestimated, although the difficulties in achieving this objective are as great today as they ever were. Finally, the exchange of experience and know-how between area specialists and application developers should be encouraged.

338. While most of the earlier recommendations still hold, the following items from the 1980 *Handbook* have been bypassed by changes in the information technology industry:

- Do not subcontract any systems work and programming, other than certain one-time applications, to outside agencies;
- Do not assign systems analysts and programmers to new projects until they have completed clear documentation of data and programs for ongoing projects;
- Do not leave administration of hardware to other parties unless it is guaranteed that statistical processing will get the highest priority.

339. With respect to the first two recommendations, instead of asking how it should be developing software applications, the correct question for the statistical agency might better be: "Should a statistical agency be engaged in any customized software development, whether developed by its own staff or subcontracted?". The evidence to date says that an agency develops its own software at its peril. The history of customized software projects is replete with those that were never completed, or partially completed and over budget. Comprehensive off-the-shelf software products are now available and

reinforce this admonition. A rule that some have used is that if seventy to eighty per cent of an agency's requirements can be met by a product that actually works, then the agency should consider changing or dropping the remaining twenty per cent of its requirements. With respect to the last recommendation, it is worth noting that many companies are increasingly seeking others to operate their hardware infrastructure. The practice of concentrating on the core functions of an organization and contracting out, or outsourcing, others that can be better done by specialized organizations is one of the greatest opportunities, and challenges, to statistical agencies in the IT area.

C. Working with the commercial sector: outsourcing

340. Organizations generally receive the best value if the commercial products and services they use can be adapted to the requirements of their mission. The common reasons for considering outsourcing include the following:

- Proven, commercially viable technologies are available only in the marketplace;
- "Standard" or "commodity" products are less expensive owing to competition;
- Vendors often have specialized skills that are difficult to maintain "in-house";
- The statistical agency can concentrate on its core mission (which is not IT project development);
- Competition can bring innovation to bear on a mission requirement;
- Risks can be shared with a vendor if the rewards are great enough;
- Proprietary or unique software or systems may be available only from a vendor.

341. Standard IT products are those that have high market penetration, such as the personal computer, and industry standard characteristics, and are available as commodities from a variety of sources. This category also includes some classes of software and network service products such as computer operating systems, office software suites, some statistical packages, network portal services and web hosting. These items are the most likely candidates for outsourcing - not only the product itself, but often its maintenance, update and replacement.

342. Commercial sources are often used to conduct IT project development and implementation or provide specialized skills such as network management and proprietary database knowledge. These sources are used where cost-effective and when the designated tasks fit an organizational strategy for in-house versus outsourced skills and responsibilities. The requirements for this category are the most diverse, and vary not only from country to country, but also from organization to organization. Past performance and the experience of other similar organizations can be the most effective aid in deciding the level, source and scope of outsourcing IT project development and support.

343. Government agencies can also accomplish their missions by outsourcing large pieces of their operations, instead of just outsourcing bits and pieces. In doing so, they must, however, take care not to jeopardize their core functions or the confidentiality of the information that is being handled. Under the proper conditions, vendors can be given the incentive to accomplish the required end results by innovative methods. Recent examples include the collection of delinquent taxes by commercial vendors (see also chapter IX, section A).

344. Outsourcing can often allow the risks to be shared with a vendor, along with the rewards. Often a vendor can share in the benefits of implementing a project, either through rights to data and/or products developed, or by receiving revenues from services provided, such as dissemination. This arrangement can give a significant incentive to vendors to be successful and receive a return on their investment in the project.

345. A vendor can offer a unique product, such as market-leading software that is effective enough to overtake the competition. Careful market analysis is needed to be sure the acquisition of the product is justified and does not present excessive risks in its application. For more specialized systems, such as Geographic Information Systems, such analysis is often a requirement owing to the dominance of a single or a few vendors. Generally speaking, care should be taken not to invent something that is much more cost-effectively available in the market, recognizing that the commercial products may be unique and/or proprietary. Attempts at government specification of formats and standards that these products must meet have often met with failure. Care must be taken not to create a sub-optimal solution to a problem best left to the creativity and competition of the private sector.

346. Finally, one of the most vexing problems in outsourcing is maintaining a healthy, productive and ethical business relationship with a commercial supplier. Too often, government contracts provide significant penalties and "protections" that the Government may impose, but fail to recognize how to provide significant incentives for the vendor. A good practice is to decide in advance on the definition of success for the vendor and then include that consideration in the design of the contract. Managing the business relationship in an adversarial way almost always leads to project failure at some point in larger IT projects. Conversely, most reputable vendors are in business for the long run, and understand that the overall success of a project is the most important objective.

347. Whether or not outsourcing is used, the likelihood of success of an IT project is greatly increased if it follows sound management practices. However, finding or recruiting managers in the statistical agency with the skill and experience to manage an outsourced function effectively can be almost as difficult as finding the specialized technical skills to carry out the work internally. The next section examines the extent to which sound management practices have been identified.

D. Sound IT project management practices

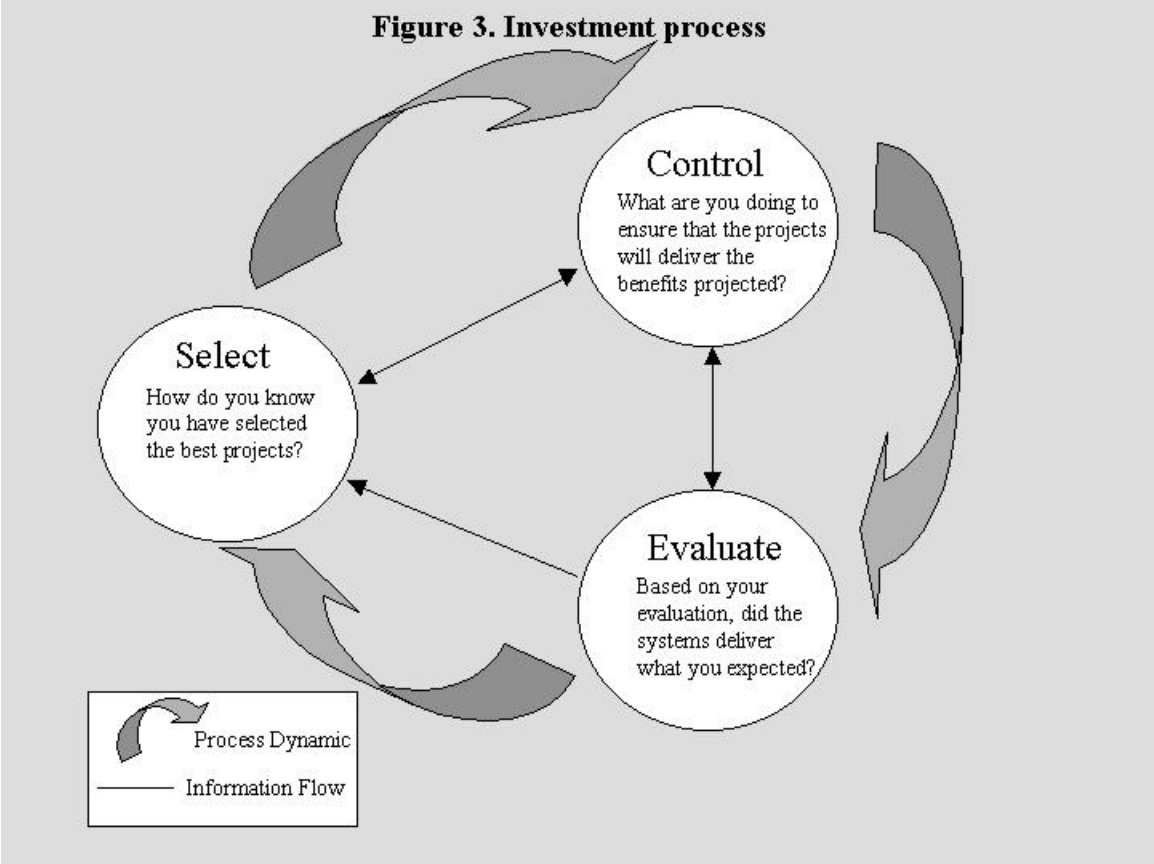
348. Owing to the importance of information technology as well as the poor results of too many IT projects, a great deal of effort has been applied lately to the identification of good project management practices.[74] These can be summarized as follows:

- Attention from top-level management;
- Effective risk analysis in guiding direction;
- Avoidance of untried leading-edge technologies and a preference for small projects;
- End-user involvement in project formulation and management.

349. The preparation of a detailed IT project plan is now common practice for invoking the necessary discipline to ensure that these practices are followed. The project plan is designed to analyse return on investment, identify risks and mitigation strategies, ensure modular development to avoid large-scale failures, and provide for oversight and review at crucial steps along the way. No sizeable IT project should be undertaken without utilizing this management process. In the United States, for example, the process is specified in detail in Public Laws 103-62, 104-13 and 104-106, which govern IT budgeting and procurement. In addition, Office of Management and Budget Memorandum M-97-02 describes three major phases of the investment and control process for IT projects:

- Selecting (screening, evaluating risks and return, and assessing how the project will help accomplish agency mission);
- Controlling (monitoring against costs, schedule and performance);
- Evaluating (post-implementation reviews, adjustments and lessons).

[74] "United States", in *Management of Large Public Information Technology Projects: Case Studies* (Paris, Organisation for Economic Co-operation and Development, PUMA/SBO/RD [2001] 1).



Source: "United States", in *Management of Large Public Information Technology Projects: Case Studies* (Paris, OECD, PUMA/SBO/RD [2001] 1).

350. Management discipline of this nature has been largely responsible for improving the success of larger IT projects in the Government of the United States over the past five years. Nevertheless, while this approach has been found by others to be useful, the only "certainty" that the chief statistician can rely on is the changing IT environment, characterized by the following:

- Continual availability of new and different IT capabilities and products;
- Claims by marketing organizations of amazing results in applying their products;
- Lobbying by internal staff who have become advocates of a product or specific technology in which they have become skilled and knowledgeable;
- Continual pressure to reduce costs and improve delivery of products.

351. Keeping an eye on how well commercial products are faring in the marketplace is critical to avoid ending up in a "blind alley" with an orphaned product. The larger vendors generally provide more stability and support of products over the long term, while many of the smaller vendors, who rely on a narrow product line, tend to have more volatile business prospects. Even if you have a solid technology management process in

place in your organization, it is still a challenge to choose appropriate technologies to fulfil mission requirements. Generally, it is best to:

- Avoid new or "immature" technologies;
- Assess the results of others who have already applied the product;
- Decide if the product is compatible with the existing information technology architecture of the organization;
- Assess the risks, and evaluate the relationship between price and performance for the product.

352. New and emerging technologies are notoriously difficult to assess in terms of when, or if, they will mature and become mainstream products. In the 1980s, it appeared that imaging technology for document storage and retrieval was ready to emerge as a major market force and several large IT companies invested heavily. When the technology failed to perform as expected, they all lost, and that market still struggles below most of the market projections for the technology. In contrast, the worldwide computer access provided by the Internet and the associated explosion of the technology beyond any projections made before 1995 are potent testimony to the power of a technology whose time has come.

353. Learning from the experience of others with similar business issues is also a powerful tool. For example, visiting other countries that have adapted technology for similar functions and comparing their results can be very helpful. It is often difficult, however, to account for differences in applications and operating environments from organization to another. It is critical to ensure that the technology, when applied successfully in one organization, can be similarly applied in another. Carefully inspecting the adaptations necessary to operate in another environment can make the difference between success and failure during implementation.

354. Finally, before choosing to adopt a new technology, it is critical to assess the risks and determine, conservatively, the projected price in relation to performance. It is crucial to remember that the track record for such implementations is notoriously poor; managers must be convinced that the IT project plan is complete and solidly demonstrates a successful implementation strategy.

Conclusions

The effective management of information technology in a statistical office is a careful balance of management discipline coupled with the innovative application of new and progressive technologies. Experience with the high rate of failure of these projects has shown that the following practices can significantly reduce the risk:

- Attention from top-level management;
- Effective risk analysis in guiding direction;
- Avoidance of untried leading-edge technologies and a preference for small projects;
- End-user involvement in project formulation and management.

In addition, a deliberate organizational strategy and management model for managing in-house versus outsourced technical skills can best guide the long-term strategy for accomplishing the statistical office mission.

VIII. INTANGIBLES ASSETS

355. Chapter VIII examines the non-staff assets of a statistical agency: its laws, policies and traditions; its prestige; and its credibility in the eyes of the public. Also covered are its policies, registers, frameworks and nomenclatures.

A. The stamp of quality

356. A statistical agency must attach its stamp of quality to what it does. For this to happen, this stamp must be recognized (see chapter II, section A.3). The situation is similar to that faced by the producer of a marketable product who wishes to differentiate the product from its competitors by instant recognition, assuming that the instant recognition is associated with sound construction, attentive service and durability. The difference is that with few exceptions statistical agencies are monopolistic producers of figures; the figures (at least the general aggregates) are freely accessible to the public; and the statistical production process cannot be replicated by the majority of users.

357. A statistical agency's stock in trade is the recognition of its name and the unimpeachability of the attributes associated with that name. Thus, the agency must be perceived to have the legal basis to intrude on the privacy of individuals, enterprises and institutions; the integrity not to part under any circumstances with the individual information it collects in the course of its activities; the competence to use that information in order to derive the best possible estimates of aggregate measures; and the sense of responsibility to ensure that those measures are useful to the Government and to the public at large. These attributes stem from pride and respect for the agency image, and sufficient legal competence to ensure that the agency works well within lawful boundaries.

358. In its administration, the statistical agency should strive to make this posture universal among its staff. In order to maintain their public image, larger agencies may even wish to devote a department to liasing with the media and reviewing their reports.

B. The force of law

359. A favourable image is necessary to the functioning of a statistical agency, but insufficient by itself. Oftentimes, a statistical agency demands, not merely once, but on an ongoing basis, that respondents tolerate intrusions into their privacy and comply with its requests for information. When the same access is desired by private agencies (e.g., those engaged in marketing), the cooperation of respondents is purchased or otherwise remunerated, and in any case is typically inferior to the level that statistical agencies judge to be acceptable. Government agencies tend to operate by invoking the efficient working of Government and of the community as reasons to elicit information, but this presupposes a legal basis.

360. The law has to define clearly why certain classes of information are required, what guarantees are offered by the statistical agency regarding how individual records are protected, and what penalties might be incurred by respondents who fail to provide truthful and timely information (see chapter XII for a broader discussion on the type of protection that is typically afforded to respondents).

361. As indicated above, a statistical agency needs to ensure that it has both a sound legal basis and the right image, with respondents and users alike.

C. Policies

362. A statistical agency may need to consider a number of questions concerning the use of its assets: for example, who in a statistical agency answers a telephone call from the prime minister's office? Who is responsible for meeting the press the day the CPI is released? Should an academic doing research on the premises be allowed access to microdata, provided it is anonymous?

363. Such questions, while frequently posed, are not always answered consistently, or else consistency is more a matter of habit than any actual policy. In some instances, however, various practices and traditions have been codified and brought together in one policy manual. Usually such an exercise has two objectives: to provide a standard of practices, thereby increasing consistency; and in the process, examine the wisdom and propriety of such practices.

364. The task of maintaining policies, making staff aware of their existence and ensuring compliance is a thankless one that usually earns the incumbent (if there is one) frosty relations with the rest of the organization. However, if policies are not enforced, individual agencies will revert to old habits, weakening any possibility of continuity or consistency. It follows that this responsibility should be assigned to a trusted official, who discusses the matter with senior officers at appropriate intervals so that they are kept abreast of goings-on within the agency and ensures that policies are revised if necessary.

Box 12. Benefits of codified policies

The existence of a code of policies has several beneficial effects. In situations where there is a high turnover of staff, the statistical agency may be subject to ongoing pressure from outside organizations for special concessions, such as waiving of fees for services, early access to new statistical information or access to material that under normal circumstances would be regarded as confidential. If there is no relevant documentation to bolster the refusal of such requests, and there exists a precedent of inconsistent reactions, institutional resistance to improper requests is weakened overall. Furthermore, the discomfort involved in appearing to be negative is considerably lessened if the agency can show that it reviewed a particular situation, decided on a course of action, and stood firm on the matter by ensuring that all its staff are aware of the recommended guidelines. The position of an agency is strengthened even further if it can show not only that the stated policy is adhered to but also that it happens to be a matter on which other agencies worldwide have come to similar conclusions. Lastly, its public image is considerably strengthened if a spokesperson for the agency can show that there are written policies covering the particular matter being challenged.

365. As interests and concerns evolve in an unpredictable fashion, a statistical agency should maintain a store of available information on a wide variety of topics. It is incomparably better to ensure that information is interrelated and, when it encompasses different attributes of what is hypothetically the same population, that the population in question is defined and measured in the same way. For example, it is far better to analyse net business formation with the knowledge that industry statistics apply to the same population than to make tentative adjustments for a different scope. Whereas in the latter instance, energies are dissipated in trying to explain what the data show or fail to show in spite of statistical discrepancies, in the former, analysis may proceed at once. However, it should be kept in mind that the design and upkeep of the special tools required for this kind of integration constitute yet another element in the statistical production process, with its own set of organizational implications. The sections below introduce a class of tools that serve as integrating tools. That is, they integrate information and/or integrate the functions of the agency itself.

D. Registers

366. The 1980 *Handbook* (chapter XIII) has a special section on registers, with particular emphasis on business registers, but information about the appropriate location for these in the organization of the statistical agency is limited.

367. The reasons are not difficult to fathom: at the time, the introduction of business registers in the production process was a novelty. It was made possible by two sets of circumstances: (a) some statistical agencies were granted access to a computerized store of administrative information (in this case, information derived from tax records); and (b) largely as a result of the introduction of database techniques, statistical agencies discovered that the computer could be used for other massive processing jobs besides international trade statistics or the census of population.

368. Today, the notion that a statistical agency must have a business register, a register of household addresses, a catalogue of location codes and possibly a number of specialized registers (e.g., a farm register or a register of ocean-going vessels) is commonplace. Therefore there is little need to describe the contents of such registers or why they are required. It is, however, necessary to consider how they should be managed and where in the agency they should be located.

369. There are various points of view. One holds that the business register should be located within the division of the agency in charge of economic statistics and that the household address register should be in the part of the agency in charge of social statistics. According to this notion, the specialized registers should be managed by those who make the most use of them (e.g., the farm register with agricultural statistics, and the vessel register with maritime transport and foreign trade statistics). Another view places registers in a central unit within the statistical agency, where it can be shown that their maintenance is an agency-wide service. Each method has its advantages and disadvantages, and these should be known in advance.

370. In a hypothetical case, assume that the division in charge of business or economic statistics consists of half a dozen units, each in charge of either an industry (such as manufacturing, mining, construction or business services) or a type of expenditure (such as exports, capital formation or consumer outlays). The decision to place the register at the very centre of the organization as a corporate asset or within the economic statistics division will depend a great deal on the organizational culture and is therefore outside the scope of this publication. However, if the register is to serve as an integrating device, it is important to keep the following in mind:

- Registers must be placed in a service unit;
- No single user organization is entitled to modify the contents of the register;
- The custodian of the register is ultimately responsible for its integrity, the classification assignments and the definition of the statistical unit.

371. When registers are looked upon as agency-wide assets, it usually best if their respective custodians are dependent on an internal board, rather than exclusively on their hierarchical superiors. The composition of the board would include both supplier organizations (e.g., those responsible for the acquisition and deployment of tax and social security information) and user organizations (all whose surveys are based on the agency register files).

E. System of National Accounts

> "The [system of] national accounts and balances represents an [integrated set] of standard concepts and classifications applicable to the most important macrodata of economic statistics and characterized by the fact that all concepts are interrelated within a system of definitional relations....They represent a useful frame for developing statistics, facilitating the identification of gaps and the setting of priorities in quantitative perspective….It is a great advantage for these integrating frameworks to be developed in the central statistical office of a centralized national statistical service or in the coordinating body of a decentralized statistical service….The units responsible for elaborating the national accounts and balances and similar integrating frameworks should be assigned a particularly important duty in regard to data improvement and integration".[75]

372. The central role of the national accounts has become even more critical in today's statistical agencies, and its use in identifying weaknesses and gaps in basic statistics has grown clearer with the publication of the 1993 version of the system.[76] There is no other such widely accepted and powerful integrating tool for social and demographic statistics.

373. Management of the national accounts requires specialized skills and the closest of liaisons with key users. Moreover, the role of the economic accounts extends beyond the production of data on the condition of the economy at regular intervals. Part and parcel of the task of estimating the broad macroeconomic aggregates is the related task of taking

[75] 1980 *Handbook*, p. 68.

[76] Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank, *System of National Accounts 1993* (United Nations publication, Sales No. E.94.XVII.4).

inventory and organizing the corresponding basic economic statistics. For cases in which a specialized agency is exclusively responsible for the economic accounts - the research department of the central bank, for example - it will have a central role in guiding the statistical system.

374. In some organizational models the unit responsible for the compilation of the national accounts is separate from its counterpart in charge of basic economic statistics. In this situation, when staff are reporting to different supervisors, it can be far more difficult to signal gaps, point out weaknesses and generally exercise leadership.

F. Central review and control of questionnaires

> "Central review and control of questionnaires is essential to integration. The subject-matter divisions of a statistical agency should as a rule be responsible for the content of questionnaires and should work in cooperation with the functional units, especially those responsible for methodology, survey design and data processing…. Before a questionnaire is put to use, a central authority should ensure that certain requirements are satisfied as regards integration, efficient data processing, editing requirements, and obligations towards the data suppliers. First and foremost, it must be determined that the concepts and classifications applied conform to the standards established so that integration is facilitated".[77]

375. These words are as relevant today as when they were first written. Moreover, to facilitate integration, the statistical agency should ensure that questionnaires are written in a language that respondents can easily understand,which minimizes response error accordingly. In larger agencies a specialized unit may be established as an agency-wide service, devoted to cognitive research and efficient questionnaire layout. Moreover, a unit devoted to these matters is ideally suited to conduct studies of equitable response burden.

G. Nomenclatures and classifications

> "Unless concepts and classifications applying to several subject-matter areas of statistics are standardized within a coherent logical system, statistical data cannot be structured to meet the needs of users for aggregated data or for compatible information from various fields….Standard definitions are needed for various items, for example urban population, illiteracy, wages received, industry, agricultural holdings, etc.…The general use of standard definitions is essential for compatibility of different data referring to the same subject….Standards that are to enjoy general acceptance should be formulated in consultation with specialists in the respective fields. Technical committees are the most appropriate instruments for this work. …The responsibility for implementation should rest with the chiefs of the subject-matter divisions; however, a separate central unit …must monitor the implementation … The uniform implementation and updating of the various classifications and the maintenance of coherence between them, require continuous attention and negotiation with the suppliers and users of the data. This is particularly important in countries undergoing rapid changes and economic development".[78]

376. The organizational elements specified in the 1980 version of the *Handbook* are still required for effective coordination today. They consist of a central unit charged with the duty of promulgating standards and monitoring their implementation to ensure coherence within the system; a technical committee to iron out difficulties and

[77] 1980 *Handbook*, p. 67.
[78] Ibid., pp. 67-68.

ambiguities in implementation; and a negotiating mechanism to ensure that users and suppliers of data fully comprehend the standard. In the light of today's experience, the requirement for international comparability requires further attention. Political unions, customs unions, free trade areas, and the global character of foreign investment all require that statistics (and particularly socio-economic statistics) be expressed in the same language. A failure to use internationally comparable standards should be regarded as a deficiency in the organization of a statistical service. By the same token, the organizational elements required for the effective coordination of classifications, nomenclatures and concepts must include a division in charge of ensuring that what is adopted nationally is comparable with that adopted by other countries.

H. Finance

377. Clearly, a unit in charge of finance is necessary to the proper functioning of a statistical agency. It should not be set up merely as a unit in charge of bookkeeping, but rather as an analytical unit (upper management requires financial advice several times over the course of a year) and as a legal unit (there must be an in-house legislator capable of determining the permissibility of expenditures).[79]

378. The administrative unit in charge of finance has as its natural function the keeping of a logbook into which it enters cash and credit receipts and expenses. Registration and annotation of transactions will be conducted in compliance with local legislation, and by a method such that the results can satisfactorily pass inspection by the auditing services of the government.

379. One obvious function of the head of the financial unit is to make recommendations as to those expenses that are legally mandated. In addition, the director of finance should be the most significant source of advice with respect to proposed expenses that, while they appear to be reasonable, may not meet all legal restrictions.

380. Statistical agencies commonly run into situations in which owing to lack of financial foresight, expenses must be prematurely curtailed, without regard for the effects of such abrupt reductions. This is generally the case when, just prior to the end of a fiscal review, the head of financial administration realizes that certain obligations will not be met unless some sacrifice is made at once.

381. Sometimes it also happens that financial administrators find that at the end of a fiscal review the agency still possesses a considerable portion of its resources. In such a case, one might impulsively look for a way to spend them, so as not to arouse suspicion. However, arbitrary spending can be more pernicious than hurried measures to curtail expenditure, leading to poor managerial decisions and waste of the public treasury.

382. It follows that the chief statistician will require advance warning of expected gaps between expenditures and resources unless measures are taken well in advance and on the basis of solid preparation. To fulfil this requirement, the financial administration unit

[79] In a number of countries there is no choice in this matter. The respective public service legislation demands that such a unit exist and assigns it specific financial and legal duties.

must have the information base and the analytical capacity to provide such advance warning.

383. No matter how small the agency, organization of the information base required to provide reliable estimates requires the help of all those with managerial responsibilities. Accordingly, the custom of taking part in financial forecasting and calculating rough but serviceable ideas on expenditures is one that should permeate the agency. In a number of offices it has been observed that that the quality of financial management goes up substantially if responsibilities and accountability are devolved.

Conclusions

A statistical agency depends on a number of capital assets, some of which are intangible: classifications, lists of names and addresses, methodologies and policies determining proper procedure. Some assets, such as computers, are designed to achieve efficiency in agency operations, while others are created to promote the integration of agency products, such as the national accounts and other databases. However, the most important assets of a statistical agency are its people and the knowledge base that they represent.

It is important to keep all agency assets in the best possible condition. Therefore, successful human resource management is probably the key factor for any statistical agency's performance. However, other tangible and intangible assets also need continuous conceptual, technical and operational maintenance and, when the time comes, replacement. To achieve this, good management and effective organization are needed, as well as the necessary precautions, financial and intellectual, on order to renew assets when their condition demands it.

IX. MANAGING THE CORE FUNCTIONS

A. Essential functions

384. An important question to ask is whether it is possible to define the essence of a national statistical office. Is there an irreducible set of functions that, if not performed by that office, would invalidate its claim to the title of "national statistical office"? Which, if any, of the functions of a national statistical office can be performed by the private sector without compromising the credibility and integrity of government statistics? Chapter IX will address these questions, which are fundamental to any consideration of organization and management.

385. The functions that are commonly attributed to a statistical office include the following:

- Planning
- Executing and processing
- Analysis
- Dissemination
- Coordination and standardization

Each of these functions will be reviewed to determine the extent, if any, to which they can be outsourced.

1. Planning

386. Planning is the transformation of a policy question or other type of request for information into a series of steps that will result in the desired information being made available within the specified parameters of time, quality and budget. It may be that the actual plan itself is developed outside the Government. This would include decisions on models to be employed, use of over-sampling, stratification and coverage. However, the statistical agency has an inherent role here. As the national statistical agency, it must have credibility and an unbiased professional reputation in order to ensure that the plan is developed without favour to any politician, party or special interest group, and that it is subject to choices based only on the highest professional standards. For example, in many countries the details of a survey plan are carried out by the private sector. However, the expertise and standing of a national statistical agency are necessary to win public confidence in the data collection.

2. Executing and processing

387. Data collection projects are increasingly being executed by the private sector in developed and developing countries. Of course, in many developing countries the execution and processing of data collection activities - census, survey and/or administrative records - was and is often carried out by international agencies. As with the planning function, there is nothing inherent in the execution function that would require it to be carried out by the national statistical agency. As with planning, however, the statistical office plays a key role, which cannot be given to those outside the Government. The national statistical office must ensure that the data collection is carried out in an unbiased way, that confidentiality is assured and that decisions are made only on professional grounds. This is not to denigrate those outside Government but rather to reinforce the principle that a specific role of those within the Government is to uphold the public trust.

388. At this point it is important to consider for a moment the question of confidentiality and how this can be maintained if the government statistical office is not carrying out the execution and processing of the data collection. One of the most important principles of official statistics is that privacy must be respected and the confidentiality of identifiable data maintained. It is the function of the statistical office to ensure this. However, this can be accomplished even if the statistical office does not control the data. For example, a contract written for an organization in the private sector to collect and process data can stipulate that the confidentiality of the data must be protected. These provisions may be very explicit and can incur severe penalties if they are violated. There are cases, in the United States for example, where the legal provisions protecting the confidentiality of data are stronger than some of those for government statistical offices.

3. Analysis

389. Analysis is one of those functions that should be carried out by the national statistical office as well as by those outside the Government. It is important to the intellectual vitality of a statistical office that members of its staff critique the process and models used to produce the data as well as discuss the strengths and weaknesses of the data. This is important for the growth of individual staff members and for the office in its quest to improve the quality of its data. However, it is also important for those outside the Government to do their own analysis. Their work is vital to inform public policy debates and provide critiques that the statistical office can use to make improvements.

4. Dissemination

390. As with other items introduced above, in many countries the private sector is already engaged in the dissemination of statistical data and information. In some cases the products that are disseminated are basic statistical information, and in others the vendor provides a value added service. This service may be to conduct further analysis of the data or integrate the data with other information. What then is the role of the statistical office? While a statistical office may not disseminate all statistical information

(it may not even be the primary source), it does have an obligation to ensure that fundamental statistical information is provided to all segments of the society on an equal basis. Depending on national practices, the statistical office may provide the information itself, or it may assist the private sector in providing the information. This principle holds despite differences of opinion (presented in chapter XI, section 3) on whether statistical information is to be provided at the marginal cost of dissemination or whether it is permissible to provide some statistical products at market rates. While the private sector may be used as a vehicle for the dissemination of statistical information, the national statistical office has an obligation to ensure, either directly or through others, that statistical information is disseminated.

5. Coordination and standardization

391. In this last area, there is general agreement that this is uniquely a government function. This is true whether coordination is between other functional ministries or decentralized statistical agencies. It would simply not be possible for a non-governmental agency or the private sector to accomplish this kind of coordination. To do so would unalterably blur the lines between governmental and non-governmental activity and change the very definition of Government. For similar reasons it would not be possible for anyone but the national statistical office to participate with others in the international statistical system in the development of global standards. No one outside the statistical agency could lay claim to an unbiased position or would have its credibility.

B. Surveys and censuses

392. Even when a statistical system is substantially decentralized and a powerful public sector body - for example, the economic policy division of the ministry of finance - is in charge of the compilation of key economic statistics, the expected pattern is for the statistical agency to be in charge of taking most or all surveys. The reason for this practice is partly historical. An office in charge of the census of population that continues to operate after the census activities are complete has the capability to undertake surveys. In most countries, survey-taking is regarded as a fairly technical and specialized activity, but it lacks the prestige that might make other agencies want to incorporate it into their own programs. Moreover, other agencies would not have the appropriate infrastructure to take it over.

393. While statistically not a “survey”, the census is obviously the flagship product of statistical offices when it comes to their capabilities in survey-taking: a census is complex, costly, visible, politically significant and/or sensitive and has to be completed within strict timeframes. Therefore, good management of the census is critically important.

394. Many materials are available that deal with the management of a census of population, including detailed reports on actual experiences of census-taking.[80]

395. Census and survey data are complementary in a statistical system. Data from surveys are usually more complex than the basic data collected though a census. Survey data are often used to expand on the characteristics of census topics (plus additional topics) and to measure change between censuses. Census information on small area populations is used to design sampling frames and selections for the survey units. While survey programmes may collect different information from the census, several topics are usually common to both. Therefore, to maximize the use of the data from both sources, it is important to standardize concepts and definitions for these common topics.

396. Of the three kinds of data collection - ongoing recurrent routine surveys (e.g., the monthly CPI and the monthly or quarterly labour force survey), ad hoc new surveys of some complexity and, last but not least, censuses - the ad hoc surveys and censuses demand particularly strong management methods. The modality that is favoured these days is "project management."

1. Project management

397. The idea owes much to the construction industry, which adopted the project management approach long ago to carry out complex projects. Like a civil engineering or construction project, a statistical survey is carried out over a long period of time, and it requires, throughout the process, active participation on the part of representatives from a variety of disciplines within an organization.

398. The creation of a project follows a recognizable pattern: the statistical agency recognizes a priority and decides to embark on a survey; the subject matter unit (department, division, branch) best suited to head up the initiative is given the budget and the leadership role (and, one would hope, a schedule and limits on expenditure, content, and maximum inflictable response burden); and a project leader is appointed and proceeds to subcontract with internal, and at times external, providers of the services required to carry out the survey.

399. The internal providers of surveys are referred to in this chapter as the various "capabilities" that must be built into a moderately-sized statistical agency. For very small offices, one officer would possess several of these capabilities.

400. The survey capabilities include several units: one in charge of relationships with respondents; another in charge of such areas as survey design, field operations, estimation

[80] The United Nations Statistics Division has developed a series of handbooks and guidelines to assist countries in their preparation for the 2000 and future census rounds. These include *Principles and Recommendations for Population and Housing* Censuses, *Rev. I* (United Nations publication, Sales No. E.98.XVII.8), *Handbook on Census Management for Population and Housing Censuses* (United Nations publication Sales No. E.00.XVII.15, Rev. 1); Handbook *on Geographic Information Systems and Digital Mapping* (United Nations publication, Sales No. E.00.XVII. 12); *Handbook on Population and Housing Census Editing*, United Nations publication, Sales No. E.00.XVII.9); and *Collection of economic characteristics in population censuses: technical report* (ST/ESA/STAT/119, forthcoming).

and evaluation; and one that is ultimately responsible for launching and operating the survey once it is prepared.

401. Apart from common sense, an indispensable element of any form of project management, several widely used techniques, including supporting software, are available nowadays to help project managers run a project. One example is the critical path method (CPM), a procedure for using network analysis to identify those tasks that are on the critical path and for which any delay in completion will lengthen the project timescale unless action is taken. For all tasks off the critical path, a degree of tolerance is possible (e.g., late start, late completion, early start). Critical path analysis and network charts used to be produced by hand. However, software is now available that requires the user only to enter the tasks, their duration and their dependencies upon other tasks; a network chart and critical path diagram are then automatically created. Decision trees are another excellent tool for making financial or number-based decisions for which a lot of complex information needs to be taken into account. This tool provides an effective structure in which alternative decisions and the (quality) implications of taking those decisions can be identified and evaluated. They also help to form an accurate balanced picture of the risks and rewards that can result from a particular choice.

402. If a statistical agency is big enough - and the project of sufficient duration - to support a multidisciplinary project, formally constituted with a proper mandate and well-defined objectives, the responsibility will probably be delegated to a steering committee. Such a committee is expected to include the principals of the various disciplines represented on the project team as well as anyone else who can assist in formulating policies for the project and assessing whether it requires a change in direction or in terms of reference. The steering committee should be able to meet as often as the project manager requires but should not meddle in the day-to-day operation of the project (quarterly meetings may be an acceptable norm). In the case of very important projects, the chief statistician may choose to sit on the steering committee, but not necessarily as its chairperson.

403. The creation and operation of projects involves a certain discipline, which takes some time to acquire. There is a difference between the routine operation of an organization and the development of an organization's functions or activities. Projects are concerned with the latter.

404. Whereas the existing hierarchy - i.e., chiefs and, directors - is accountable for the ongoing management of the organization, the project manager's accountability is limited to the duration of the development of the project. Once the development stage is over, the project manager hands over the project and project team and disappears as an organizational entity.

405. The project manager is appointed for a finite period and receives the project objectives from the chief statistician (or a delegate), including specifications for the characteristics of the measuring instrument, a schedule and a budget.

406. In theory, the project manager could be selected from a hierarchical level inferior to that of other members of the project. In practice, this is not done, simply because it creates a gap that might impede the freedom of action that the project manager requires.

407. For their day-to-day activities, the other members of the project will work outside the authority of their usual chain of command, taking instruction and guidance from the project manager. If the project team members' superiors wish to intervene, or even to make inquiries, they should communicate with the project manager.

408. The list of disciplines represented on any project will of course vary with its nature, size, and complexity. The planning list for the census of population can be used as a checklist for what is required in any project. Thus, even a moderately sized project will include supervisors of questionnaire design, content definition, sample design, supporting computer systems, fieldwork, respondent relations, project finances and internal communications.[81]

409. The specialized knowledge required for development purposes will be supplied by the project team members. Their leader's primary task is to ensure that the plan to meet objectives has integrity; that adjustments to the plan take place whenever circumstances warrant; that there is no over-expenditure of resources; that members of the team keep each other properly informed; that there is no duplication of effort; and that there is working machinery to settle conflicts and differences of opinion. While it may be helpful, it is not necessary for the project team leader to be an expert in the subject of the project. The ideal team leader of an ad hoc project team would be proficient in the subject matter, knowledgeable about management techniques such as budgeting and critical path analysis, an excellent communicator and able to empower others and generate trust among the team members. Of course, finding anyone with all of these abilities and skills is virtually impossible. Therefore, while realizing that all of these abilities and skills are important, the issue in choosing a team leader is to decide which are more important than others. This is often a matter of judgement, but, for example, it is probably wiser to choose someone strong in management but weaker in substantive skills than the reverse. The team leader should be a first-rate coordinator, manager and diplomat, methodical and well organized, and inventive but not excessively prone to risk-taking. It is important, however, that the team leader not be devoid of substantive skills lest he/she become a target of ridicule owing to excessive ignorance of the subject covered.

410. Discipline must above all be imposed on the organization's established hierarchy. It should not interfere with the project manager either directly, or through attempts to give the project team members guidance in addition to, or in opposition to, that given by the project manager.

[81] Very few projects, with the exception of the census, have the need, time or resources to document their own history and negative experiences. However, without a tradition of documenting experiences, a project cannot benefit from previous successes and failures. Oral history, though sometimes helpful, can also be a means of miscommunication through anecdotes and distorted recollections.

2. Working with project staff

411. In any project leading up to a survey, from design onward, the project manager will be required to deal with staff operating from at least three very different perspectives. First, there are the subject matter staff, who interact with users; transform user problems into measurement projects; and are in charge of evaluating the survey results and interpreting them on behalf of the user. Their perspective is driven by the notion that surveys should yield statistics that inform the user on particular problems. In fact, for subject-matter statisticians, the rewards are derived from having successfully met the expectations of users. This is true even if there is no strong dividing line between users and respondents.

412. Second, there are the survey statisticians,[82] whose function is to ensure that the measurement has the right quality attributes. Their task is to ensure that if there is bias in the measurement it is understood; that the inferences are only those that are supported by the data; and that the methods used stand up to scrutiny and are properly documented and accessible. The community that survey statisticians interact with is one that is primarily interested in methods, rather than in the result of any particular project. The rewards come from that same community, mostly academic and devoted to theoretical and applied research.

413. Third, there is the field organization, the particular arm of the statistical agency that contacts respondents, and promptly and courteously deals with any complaint arising from lack of clarity or excess burden.

414. These three groups (in simple cases, they could be three people) will embody different points of view and have different priorities. The subject-matter experts will be largely concerned with speed (as they are the ones who look after the budget) and with the relevance of the results to the issue that provided the impetus for the survey. The survey statisticians, acting as the statistical conscience of the agency, will be most concerned with the integrity of the selected sample and with consistency in the administration of the survey interview. And the field organization will insist that good will must not be abused, regardless of the importance of a particular survey.

415. Usually, these three perspectives yield lively discussion in the course of any project and at times create tensions, which must be alleviated. There are a few "do's" and "don'ts" that should be made clear if the project management process is to go forward productively and efficiently:

- The project manager was chosen because he/she had the confidence of the agency's management and should therefore be neither second-guessed nor overridden. If his/her performance does not inspire confidence, a replacement should be made;

[82] The term "survey statistician" mentioned here is used as synonym for mathematical statisticians. It comprises those statisticians normally responsible for such tasks as the design of a sample and the estimation of the results together with the sampling error.

- Project team members should not lobby their respective organizations to challenge the project manager's decisions. Only one entity can be accountable and granted decision-making authority;

- Compromise is essential. Most decisions will reflect compromises and will vary according to the relative importance of each of the different perspectives – subject-matter, statistical, respondent - at different stages in the history of a project;

- Vesting the power of taking decisions in the project manager does not imply that he is all-knowing and infallible. All members of a project should be encouraged to seek advice, particularly when arguments appear to be finely balanced.

416. In order to make the project manager's job viable there has to be an ongoing dialogue among all members of the project. If balance is lacking between the understanding brought to bear by survey statisticians and the subject-matter body with which they interact, there may be a serious management problem for the project with, at times, wider and unfortunate repercussions.

Box 13. Typical problems experienced by project teams and created by different perspectives

Internal Perspectives

For the purpose of this example, let us assume that a project manager is in charge of an initiative designed to measure the environmental impact of the packing of consumer goods (e.g., whether recyclable materials are used; how packing waste is disposed of; the impact of public sorting devices on the disposal of waste). The most efficient use of the statistical agency infrastructure is to have this new survey accompany the existing labour force survey and begin the interview with survey questions on the environmental impact of the packaging of consumer goods. This approach would be efficient, as the environmental survey is shorter than the labour force survey. However, the environmental survey requires the respondent to keep a diary, which may affect the willingness of the respondent to cooperate in the labour force survey. The head of the field organization knows that his performance will be judged most of all by his ability to carry out the labour force survey and that success with this new survey is secondary. Accordingly, in this hypothetical situation, he/she argues that the preferred option is to keep the new survey separate, and if there were good reasons not to proceed in this fashion, then the survey would be kept only as an add-on, to be administered after the labour force interview is successfully concluded. Both options, though preferable in the eyes of the field organization, are inefficient from the point of view of the project manager. The first is too costly; the second runs the severe risk of increasing the non-response rate beyond the limits imposed. The project manager is clearly in charge of a limited initiative. However, interaction with a service provider that takes a broader perspective is bound to produce conflict and call for a higher level of mediation.

External perspectives

In this example, a ministry of tourism asks the statistical office to conduct a survey on the number of tourists arriving and departing and on their related expenses during their stay. The ministry of finance, responsible for balance of payments statistics and conscious of the fragility of the travel account in the balance of payments as well as that account's importance in explaining fluctuations in the current balance, supports the request and offers to co-finance the survey.

The project manager in this hypothetical situation loses many nights' sleep because the two sponsoring agencies cannot agree on the possible interpretations of the priorities listed as part of their contract with the statistical agency. The statistical agency, anxious not to forego an important opportunity, agreed to formulations

that turned out to be too vague and did not specify a protocol for how the sponsors should behave during the execution of the project. As a result, and in spite of the fact that the statistics on tourism improved, both the ministry of tourism and the ministry of finance feel that their goals have not been met; neither ministry has much faith in the technical competence of the statistical agency, although both agree that it treated the results with moral integrity; and no party has the energy or the resources to make another attempt, even though the survey sample was limited in size and scope.

To avoid a conflict such as this one, the statistical agency should (a) attempt to lay out all the "don'ts" it should have learned from the first exercise; (b) demand an agreed-upon list of objectives in line with the budget; and (c) above all, insist on a commonly agreed-upon definition of the goals of the project.

3. Working with respondents

417. Part of survey capability consists in an established relationship with respondents, which comprises a way of (a) finding them; (b) explaining to them why they should be willing and truthful respondents; (c) persuading them to comply, without necessarily threatening them with legal actions; and (d) dealing with complaints in cases where surveys are too lengthy, unclear and continuous. Naturally, none of this is attainable without a survey organization that includes a respondent relations department, entrusted with the following duties:

- Handling the public relations required for potential respondents to understand why they have been selected, what is asked of them and what is the public good that is served as a result of their cooperation;

- Exercising special care and taking all the required precautions in cases where the announced survey is either unusually long (for example, surveys of family expenditure) or unusually intrusive (for example, surveys of harmful drug consumption and surveys of fertility);

- Keeping a register of respondents contacted and survey interviews completed so that recalcitrant respondents can be identified and persuaded to participate;

- Sharing information with respondents, so that they feel not only that they have made a contribution to the public good but that there is some personal benefit as well;

- Having the resourcefulness, presence of mind and necessary information to find alternative respondents when there is strong resistance to the survey or when the original respondent can no longer be located.[83]

418. Accomplishing these tasks requires tact and diplomacy, together with firmness and determination. There will always be people in either the household or the business sector who will refuse to comply, no matter how good a case for cooperation has been put

[83] Strict methodological guidelines should be in place to ensure that such replacements do not compromise the propriety of the original choice.

forward. This situation cannot be avoided and the officer-in-charge should not assume personal responsibility for a small percentage of such cases. However, if the rate of refusal appears to be increasing, procedures and methods should be examined, for this may reveal a serious inadequacy in the methods adopted.[84]

4. Repository of statistical expertise

419. A statistical agency must have the following capabilities if it wishes to be recognized as the repository of statistical expertise and the rightful custodian of the official national statistical infrastructure:

- The capability to design a comprehensive survey that takes into account sample selection, survey design, estimator choice, estimation method, and calculation of variances and sampling errors;

- The capability to design a questionnaire with properties that minimize the respondent burden while recognizing the importance of minimizing cognitive errors that could arise from lack of clarity in the questions;

- The capability to relate collected information to concerns that drive users to solicit information from the statistical agency;

- The capability to analyse information that has been collected (and is about to be disseminated) so as to maximize its informative role.

420. These capabilities must be held by some part or parts of the organization. Logically, the more technical capabilities - sample survey design, estimation techniques, and advice on drafting and questionnaire layout - should be the responsibility of one organizational unit, in order to promote coherence in the agency's survey activities. Questionnaire content and substantive processing of the information collected should be the responsibility of another part of the organization. Designating responsibility for analysis of survey results is largely dependent upon the availability of analysts and on the way in which the statistical agency cooperates with outside specialists. Conventionally, all issues relating to content - interaction with users, determination of the schedule for data collection, financial arrangements to support the initiative (particularly if sponsors are involved), and tabulation and accompanying analysis - have been the domain of the subject-matter staff. Finally, the field organization is charged with the responsibilities of establishing contacts with respondents and ensuring that they react favourably to the initiative and provide the right kind of information.

[84] Failure to address the respondent in his/her language, or with the accent or intonation prevalent in the region or province, could ruin the chances of success for even the most unobtrusive of surveys. Excessive zeal in pursuing recalcitrant respondents in a small community can just as easily ruin a survey conducted in the area.

5. Flexible survey-taking capability

421. It is commonly alleged (and there is truth behind the allegation) that statistical agencies are slow in reacting to requests for vitally important information. In fact, the lags involved in responding with hard information, particularly information that includes a measure of the rate of change, are aggravated by the typically vague formulation of the requests. Such undertakings do take considerable time, but while the lags can be accounted for and seem natural to fellow statistical practitioners, it can be difficult for users to understand why it takes so long to conduct a survey and disseminate the results. To respond to such ad hoc challenges, a valuable survey-taking capability of statistical offices can be provided by a unit that is able to mount a quick survey, either as a first instalment on a more permanent effort, or as a one-time exercise.

422. One way of deploying such a unit is to assign to it the responsibility of all feasibility tests in a statistical agency, so that its staff becomes accustomed to launching quick efforts designed to settle basic questions, preceding what might be a more substantial survey. The mission of this unit might be to survey a given number of respondents (households, businesses or people in Government or in public institutions) in a set amount of time (e.g., a maximum of sixty or ninety days). By developing such a capability and periodically demonstrating its power and scope, an office could greatly increase its credibility and gradually establish pre-eminence in the field of statistics

6. Administrative records

423. A statistical agency should not automatically initiate a new survey in response to every demand for information. Rather, it should systematically attempt to react to new demands by exploring how they might be satisfied using regularly collected data or, failing that, by examining whether the administrative records already in the hands of the Government can address the new request, at least to some degree. Whether or not, or rather to what extent administrative records can be used to replace or to supplement statistical survey information, is a very complex issue and the answer also depends very much on specific national situations. Statisticians tend to be wary of the quality of administrative information, in terms of concepts and coverage.

424. Nevertheless, the attractive feature of administrative records is that they are to be collected or have been collected anyway. It is probably true in many countries that some administrative records, such as tax records, have a very good coverage of parts of the population, and that the rate of response is substantially better than that achieved by a statistical agency. Moreover, there is always the possibility of improving on the information yielded by those records by supplementing them with data obtained from a much smaller sample of respondents.

425. If these advantages are recognized, it follows that some part of the statistical agency, preferably one that is set up alongside the field organization, should have staff charged with the following responsibilities:

- Keeping abreast of administratively collected data held by other parts of the Government;

- Evaluating each new request to determine the extent to which it can be met without resorting to a new or expanded survey;

- Negotiating with the custodians of the relevant information to determine how it can be shared within the legal framework imposed on government information activities.

Conclusions

A statistical system requires the ability to carry out censuses and surveys. This capability is based simultaneously on doing what is necessary to carry out regular surveys and on having the people, techniques and organization required to develop a new survey instrument and deploy it successfully. The chief statistician must also give careful consideration as to which, if any, core functions should be outsourced.

The most effective organization for managing large incidental surveys is that of the multidisciplinary project, in which, under a specially appointed project manager, the organization's service providers contribute their resources proportionately.

The project manager must interact with the service providers. At times there will be obstacles, partly owing to different perceptions of what constitutes success and partly to various opinions on the best way to solve problems. In designing the organizational framework for development projects, the chief statistician will take those obstacles into consideration and will establish a pre-emptive conflict-solving mechanism.

Usually the project manager will report to a steering committee, an ad hoc organization called upon to assist in interpreting and, if necessary, changing the project's terms of reference.

In addition to capacity for the execution of a regular survey programme, it is advisable to develop a rapid response capability in order to show sensitivity to emerging ad hoc requirements, while continuing to exercise discretion before committing to costly and cumbersome surveys. Access to administrative records at all times is desirable, not only to promote rapid response, but also to preserve the good will of potential respondents.

X. FIELD ORGANIZATION

A. Interacting with respondents

426. Chapter X considers how an agency should be organized in order to deal efficiently with respondents to statistical inquiries.

427. One method is to invest in the creation and maintenance of a working field organization. By definition, a field organization interacts with respondents to communicate the agency's need for information; elicit relevant information in the correct form and at the appropriate time; maximize respondents' cooperativeness and goodwill; and adequately explain the consequences of refusal.

428. As far back as the Interregional Seminar on Statistical Organization, held in Ottawa and New York in 1952, participants representing statistical offices of all sizes in both developed and developing countries reached the conclusion that if any part of statistical operations would benefit from management according to function, rather than subject matter, it was the field organization. All participants shared a similar opinion regarding the census of population - the census itself cannot be managed without an effective national field organization, and once created, that organization can be put to use at low marginal cost in undertaking other surveys.

429. Nevertheless, two factors can alter this straightforward conclusion. Some countries have a geographically decentralized statistical system, not out of choice but out of constitutional imperative. If the role of the central statistical office is limited to assembling results compiled elsewhere, issuing coordinating guidelines and perhaps surveying its immediate surroundings, the issue of a national field organization does not apply.[85] However, if the individual states, provinces or cantons that make up the decentralized system conduct multiple surveys, some of which are carried out on a continuous basis, they will tend to have a field capability organized by function.

430. The reasons are straightforward. Economies of scale exist in recruiting, training interviewers, managing a large workforce, ensuring that embarrassing duplications are avoided, and preventing under-utilization of the workforce by drawing up permanent, long-term and short-term contracts. These arguments were recognized fifty years ago and continue to hold today.

[85] In several countries in South America, the scope of many statistics based on surveys is limited to the national capital, and so coordination is more or less assured through cooperative initiatives with the other levels of Government. The custom in some of these countries is that the manager for each survey handles its field force.

431. Suppose that the field organization is established on a permanent basis, in charge of the collection operations for all surveys (except those carried out through direct contact between subject experts and respondents). One of its chief assets is its location in different parts of the national territory. In a sense, the field organization acts as the local eyes and ears of the central office.[86] Many field organizations are therefore organized so as to strategically distribute resources throughout a nation, while maintaining a centrally located cell in charge of coordination and liaison. The responsibilities of the central cell are critical. It serves as the day-to-day link between the decentralized network and the management of the statistical agency; ensures that the different offices of the field organization work as a system rather than as a loose confederation; and serves as the point of contact for the project managers to convey their wishes, doubts, and complaints to local offices.

432. The field organization should be a key participant in a standing committee that settles differences of opinion on how to approach respondents. If the field organization believes that a recommended approach to a particular survey threatens respondents' goodwill, it should be able to express its concern to the agency's upper management. If the issue is to develop an approach to the census of population or any other major census, the field organization will take part in discussions at the highest level.

433. Of course, the existence of a field organization is predicated on the need to divide the statistical process into discrete segments, and in particular, to separate the collection of respondents' information from other stages such as editing, estimating or tabulating. As the use of the Internet, both in general and in statistical activities, becomes more widespread, the role of a special field organization will likely change in the face of technological progress.[87] However, current circumstances are such that these organizations are bound to continue with their traditional functions, at least over the next decade or two.

434. Large field organizations tend to be divided into two or three groups. One will be in charge of interviewing households, and its talents are best put to use in household surveys conducted on a continuous basis (e.g., the labour force survey). There will also be a group in charge of interviewing businesses, and its membership will range from those with formal or informal bookkeeping or accounting skills to those without a great deal of experience, who will be primarily responsible for the delivery and pickup of paperwork. A third group may be in charge of pricing consumer goods, and their knowledge will encompass a wide variety of products such as foodstuffs, clothing, medicine and entertainment.

435. The groups themselves may have a two-tiered composition. They may include a small group of permanent employees who provide leadership, organization and

[86] No matter how unified the organization, local offices will often perceive their first loyalty to be the local constituents (respondents) and lose sight of the fact that they must also serve the interests of a national agency or system.

[87] Much of this has already occurred with tabulation and in at least part of publication. The desktop computer and an array of accessories, along with electronic dissemination, have rendered a good deal of traditional printing paraphernalia obsolete, except for basic tasks (collating, binding, sorting and mailing).

continuity, and a larger group of employees contracted on a renewable, short-term basis. These short-term employees afford the field organization a great deal of flexibility in the face of fluctuations in workflow.

436. A field organization deals with several classes of respondents: households, enterprises, Governments, non-commercial institutions and at times foreign institutions. Each possesses unique attributes and may be sensitive, and even resistant, to different types of requests. In this section, we examine some of these issues and the methods that a statistical agency can deploy to maximize respondent participation.

1. Households

437. Above all, interactions between households and the statistical agency concern the census of population; surveys of household incomes and expenses; labour force surveys; and special surveys that supplement the latter two.[88] Successful field organization managers responsible for households should possess the following:

- A list of the respondents comprehensive in scope;[89]
- Thorough knowledge of the ethnic and socio-economic characteristics of the population, so as to maximize cooperation and minimize the friction caused by invasions of privacy;
- A method of training interviewers that reflects the organization's accumulated knowledge of how to successfully approach the respondent community.

438. Interviewers should not be deployed until they have thoroughly understood the difference between coercion and cooperation. In addition, a few other matters require understanding. For example, households seldom keep usable records. The easiest questions are those based on knowledge of their status (e.g., demographic, participation in the workforce). The most difficult are those that require exact recollection or access to detailed records (e.g., when and at what cost was a particular household item purchased).

439. Households may react poorly to certain questions on the basis of their cultural and demographic characteristics. In some households, respondents may prefer to keep the nature of their expenses hidden, and certain expenses are considered to be morally wrong (e.g., alcohol and tobacco). Controversial topics such as abortion may elicit diverse, possibly even violent, reactions.

[88] Occasionally there are highly specialized large-scale surveys that require a dedicated organization to be handled correctly.

[89] These lists can be derived from the census of population, from other household surveys that are updated on a continuous basis or from a list enumerated by the field organization itself.

Box 14. Two communities

In one country, the population was almost evenly divided between the coast and the highlands. While there was no strife between the communities, they were still far from integrated and showed pronounced differences in their attitudes toward finances and family matters. Certain types of statistical inquiry were easiest if the interviewer belonged to the other community, since this was considered less intrusive than sharing answers with peers. For other types of questions, the opposite was true. Successful administration of surveys requires detailed knowledge of such attitudes.

440. The effectiveness of a field organization depends on the following:

- The depth of its knowledge of what works and what does not in household interviews;
- An interviewer training programme that foster respondent/interviewer relations;
- The capacity to support an interviewer who must contend with overwhelming resistance to parting with information.

441. These capabilities are more easily found in a functional organization than in an organization grouped by subject matter.

442. Whatever the legal basis for dealing with households (see chapter XII), the field organization will want to handle them gently. In some countries, legal and political measures are in place to protect respondents' privacy. Since statistics are generally not as high a priority for the Government as other, more pressing issues, when friction arises from the nature of household surveys the Government is more likely to side with the respondents, without taking the time to fully appreciate the loss of information and its consequences. The field organization should consider this possibility when dealing with households and make sure interviewers do not overstep their bounds.

2. Enterprises

443. Dealing with enterprises is quite different from dealing with households. Enterprises find it much easier to respond to questions on the basis of records than from memory or opinion. One obvious reason is that once the decision to part with information has been made, a junior officer can be authorized to provide record-based data; the same officer would not be authorized to express opinions on behalf of the firm or to provide facts from memory. In short, record-based responses are the most predictable and time-efficient from the point of view of business management.

444. Note that the distinction made above applies mostly to properly organized and constituted enterprises (generally medium-sized and large enterprises). Smaller and/or informal enterprises are best treated as households, and the emphasis on records is considerably less, since answers may not be based on a proper bookkeeping system. In addition, the latitude given to interviewers in the survey process is quite different in each case. Whereas interviewers, once they have received proper training, can be safely trusted

to follow the procedures to replace one household or small firm in the informal sector with another, the same is not true for larger firms. For this reason, one way of deploying the field force is to assign to the more experienced and more tactful interviewers the task of dealing with households as well as with other situations where tact and persuasion are of paramount importance. Less experienced interviewers could take on regular contacts with properly constituted enterprises. Whereas initial contact with an enterprise should be made at the highest level that the agency can afford, the follow-up should be left to someone whose functions are principally those of a messenger. In situations where the same matter can be handled by mail, telephone or e-mail, these are preferable. If e-mail (or fax) is chosen, the field organization should ensure that proper technical support is provided.

3. The consumer price index: a special case

445. Whether the workforce charged with collecting price information every month should be an integral part of the field organization or should be placed directly under the control of the CPI department is a matter of preference, efficiency and public relations. Clearly, the department responsible for the CPI will want to be certain that its instructions - particularly on quality and replacement rules - are followed scrupulously, and may fear that dividing the attention of the field organization may dilute the seriousness of those instructions. Moreover, the agency may also fear a loss of confidence in the CPI if the public has the impression that insufficiently trained personnel are collecting information on prices. As the CPI conforms to neither household nor enterprise interviewing protocols (the bulk of it is carried out by requesting access to public information displayed by retailers, or, in certain cases, in advertisements or catalogues), CPI interviewers require special training. These arguments favour placing the CPI field force directly under the CPI department, rather than within the field organization. However, in countries where size and geographic layout necessitate local administration, an independent CPI interview force would likely be inefficient. In such cases, it would be preferable to make use of the local field organizations, under the supervision of experienced CPI interviewers.

4. Government

446. The procedure for collecting information from the Government is different from that employed for households and enterprises:

- Government agencies may have field organizations of their own; therefore, a combined effort is required;

- With respect to disclosing information, the law that rules those agencies may oppose that of the statistical agency, requiring the resolution of a legal conflict;

- The collection of information may require government agencies to adhere to a coding standard developed by the statistical agency, even though the agency has no jurisdiction to enforce it.

447. The first situation is often the case with ministries of agriculture in countries where agriculture is dominant and where there is a tradition of intensive use of quantitative information in the ministry.[90] Rather than debate issues of control, the statistical agency should make use of the existing results and the existing workforce, and engage the ministry in more productive discussions, such as whether or not the collection should be modified (as may be required for an integrating framework such as the System of National Accounts).

448. The ministry of transport is another institution with a tradition of using quantitative information, in which the work of the ministry generates administrative records that can be used for statistical purposes at a sufficiently low marginal cost. Again, the wisest policy is to reach an agreement with the ministry so as to make the best possible use of the existing information. Sometimes the administrative information does not conform to international standards, but it usually is easier to make the necessary adjustments than to embark on an independent data-collection effort.

449. The main barriers in making use of data collected by other ministries (especially government agencies in charge of tax collection and the administration of social security) are legal and regulatory. Tax collectors tend to be as protective of individual records as statisticians. The very notion that sharing occurs could deeply offend taxpayers and tarnish the ministry's reputation, no matter how powerful its detection and collection capacity. Furthermore, if knowledge that the statistical agency receives information from other government agencies creates the perception (no matter how ill-founded) that it provides complementary information, the agency's reputation may be tarnished. Chapter XII, section A.4 attempts to show that in spite of these difficulties, one-way sharing of tax information is the most powerful method of substantially reducing statistical paperwork for enterprises.

450. Generally, it is advisable for the statistical agency to refrain from creating permanent arrangements in which other ministries collect the data, instead using existing resources and political pressure to reach a constructive and collaborative agreement. Perhaps the best way to proceed is to establish a tradition of informal inter-ministerial committees. It is possible that the agency will encounter much frustration along the way, as non-statisticians rarely perceive collaboration on data collection to be an urgent task. On the other hand, non-statisticians may be seduced by the prospect of taking credit for an important service rendered to respondents, especially when the respondent community is broad.

451. Lastly, there is the matter of enforcing a common standard in the collection of statistical data. This often arises in the context of specialized public finance compilations, particularly for the national accounts. Assuring that ministries use the same definition of current and capital expenditure at the micro-level is an arduous and at times thankless task, but one that cannot be avoided.

[90] In a number of countries, agricultural statistics were among the first statistics developed, and prior to the existence of a statistical office, the workforce required to collect them was headed by the ministry of agriculture.

5. The special case of provincial and local Government

452. In many instances, provincial or state Governments have highly developed statistical offices of their own. This is the case not only with federal countries such as Brazil or Germany, but also in non-federal countries such as Spain, where the autonomous regions have offices with the capacity to collect, compile and disseminate data of special interest to the public.

453. In these situations, it is important to prevent different field organizations from overlapping and exhausting respondents' goodwill. When legal devices are in place that allows information to be shared between statistical agencies, and when working arrangements are sufficiently intimate to support such devices, a balance can be achieved.

454. Dealing with other government institutions does not automatically involve the field organization. In principle, these matters are worked out between the heads of statistical agencies and their legal advisors, when possible. If different levels of Government are involved, the political heads responsible for intergovernmental affairs on both sides may be brought in. Of course, if the agreement results in a delegation of tasks to field organizations then they will play a role in data collection. In federal countries or in situations that involve local Government, cooperation will tend to be countrywide. In such cases, the field force operates nationally and has an agreement with the statistical agency as a whole, rather than a coordinated set of understandings with each subject-matter unit.

6. Non-profit institutions

455. Non-profit institutions are becoming more important in almost all countries of the world. In recognition of this, guidelines have been developed explaining how to account for the economic impact of such institutions.[91] Most non-profit organizations and voluntary bodies that engage in any monetary transaction with the public have some rudimentary bookkeeping system, and the survey demands from them tend to be relatively limited. However, non-profit health and education institutions may require more attention from the field organization.

456. The cases of non-profit health and education institutions constitute a separate issue, largely because their relative size measured as a share of GDP and their social importance in the development of a country demand special consideration. Many countries have a tradition of specialized surveys of health and education. However, there is also a trend towards breaking away from the traditional surveys of these two services and, in addition to measuring material and human inputs,[92] attempting to measure outcomes. One framework that has gained some acceptance shifts the emphasis onto longitudinal surveys ("films" rather than "photos"). However, the statistical complexity

[91] *Handbook on Non-Profit Institutions in the System of National Accounts,* Studies in Methods Series F, No. 91 (United Nations publication, forthcoming).

[92] The pattern used to be to measure hospital beds and rates of occupancy as a health indicator and desks and rates of enrolment as an indicator of education. Neither indicator paid much attention to issues of quality and effectiveness.

of such efforts places them beyond the range of activities that administrative staff of non-profit hospitals, clinics, schools and universities can accomplish as a by-product of their regular activities. If a statistical system is still involved in specialized surveys of health and education, coordination between the providers of the registers and the data collectors is of parliament importance.

457. As a final comment on this matter, the specialized nature of these two fields - health and education - is such that in the majority of countries that compile regular statistics on them, the statistical or analytical units in charge of compilation are located in the responsible ministry itself. For small and even medium-sized statistical agencies that are still sorting out their mandate, it may be prudent to leave matters as they are rather than attempting full centralization with few chances of succeeding.

458. Offices that are better established may wish to experiment with the creation of dedicated institutes or statistical satellites. Such bodies come in a variety of forms: in addition to having their own chief executive officer, they can answer to a board made up of representatives of the education (or health) sector and of the statistical agency.

B. Interacting with a subject-matter organization

1. Perspectives

459. Each major organizational unit within a statistical office should possess a perspective broad enough to see how its actions may intersect with the rest of the office or, in a decentralized system, with the rest of the system. Such broad views are required for the most part, when agencies reach important crossroads, which fortunately does not happen too often. In everyday matters, the scope of interaction is usually limited to those with whom information is exchanged. Thus, the management of a field organization will bear in mind first and foremost its respondent policies (see chapter XII) and communication with that part of the agency in charge of processing currently collected data.

460. Invariably, a narrow perspective will produce tension. For example, when requesting detailed information on consumer expenditure, those responsible for economic statistics may consider minimizing errors in CPI weights as their overriding objective owing to the harm such errors are bound to cause. They will therefore wish to add all possible precautions to the relevant inquiry. This stance may be countered by those in charge of field operations, whose experience tells them that the shorter the interview, the more attentive the respondent.

461. The tension itself is a healthy manifestation of a commitment to quality that motivates both units. If neither unit expressed its point of view on avoiding pitfalls, tensions might escalate even further. However, given the possibility of conflict, an organizational device should be in place that forces agreement between the concerned parties without having to call upon senior officers. In the case of new initiatives, the mechanism should lie with the project management, and ultimately under the authority of

the project manager.[93] When the point of conflict is the result of an ongoing activity, its resolution requires the involvement of a standing committee. The reason for a standing, rather than an ad hoc, arrangement is that problems concerning the interaction between a field organization and subject-matter units are bound to arise with considerable frequency. The important thing is for differences of opinion to be channelled into cooperative dialogue that yields constructive and binding resolutions for all parties.

2. Censuses and surveys

462. The management of the field organization cannot treat censuses and surveys as if they were interchangeable. Censuses, particularly censuses of population and housing, require a major civilian mobilization and therefore should be considered as a national event, whereas surveys should not, owing to their scale, impact and potential for repetition (though such a thing should be avoided).

463. The census of population is vastly important to any field organization for several reasons. In many agencies, field organizations were in fact created in response to the needs of the census; accordingly, the census is their prime commitment. Second, the most visible part of any census is the collection of data, since it requires a brief period of intense activity on the part of all households.

464. In contributing to the preparation of a census, the field organization will usually call on its detailed knowledge of the country and assist in translating it into a data collection approach. It will also provide its knowledge of local conditions to identify and mobilize local leaders.

3. Managing interactions

465. Whatever the arrangements, a field organization, like any other function-based organization within a statistical office, must look after its connections within the rest of the office with great care. The points of tension arising from these interfaces, which must be watched, include the following:

- The challenge from the pressure of the subject-matter specialists, who are the farthest from respondents - analysts, national accountants and specialists in marketing and dissemination providing the outstanding examples;

- The ambiguities about the level of quality with which a survey should be conducted. The field organization must be mindful of coming to a sensible compromise between its standards of quality and the survey budget;

- The proper balance between those survey operations that can be effectively conducted in regional offices (in a decentralized mode) and those that must be conducted in a centralized environment, or else the standards of consistency

[93] This in no way precludes intervention by the management of the statistical agency or the field organization if they feel that the decision of the project manager affects the integrity of the agency programme.

cannot be applied with guarantees of success (surveys involving complicated coding, for example).

466. In addition, the field organization should be watchful of technological developments that may short-circuit it before its management has had a chance to retrain the staff. Contacting enterprises (and in a few years this may extend to households) via the Internet is undoubtedly going to bring the subject-matter expert into much closer contact with the respondent. Field organizations should find a niche in the new process where they can play a necessary and cost-effective role.

467. There are a number of infrastructural services that the chief statistician should make sure are available to the staff employed outside the central office, including:

- Access to statistical frames;
- Access to equal training opportunities;
- Access to experts in the central office in real time to make rulings on the application of standard concepts.

Conclusions

There is general agreement that the field organization can be effectively organized by function.

The effectiveness of a field organization depends on the following:

- The depth of its knowledge of what works and what does not in household interviews;
- An interviewer training programme that fosters respondent/interviewer relations;
- The capacity to support an interviewer who must contend with overwhelming resistance to parting with information.

If the field offices are dispersed throughout the country, then it is critical to have a central function responsible for liaison and coordination.

XI. GETTING INFORMATION TO THE USERS

> "It is probably not an exaggeration to say that in most countries the statistics available, in published and other forms, are by no means fully taken advantage of by users, partly because the statistics are not well enough known…The fostering of a more extensive exploitation of the statistics by active promotion based on user studies is an integral part of the dissemination effort."[94]

A. General dissemination issues

Box 15. Definitions: dissemination and publication

The words "dissemination" and "publication" play crucial roles and possess broad definitions in the text that follows. Dissemination is taken to mean "making available to the public", without restrictions and without regard for the way in which the action is carried out. Publication involves the action of making statistical information public in printed form or on the Internet and also includes CD-ROMs, magnetic tapes, audiocassettes, radio and TV broadcasts, as well as any other media that can meet the same objectives.

468. In part because of the condition identified in the above quotation, there is a class of intermediaries in the dissemination process whose task is to seek out the users and tailor the information to suit those users' needs, while simultaneously providing useful interpretation of the data.

469. The involvement of intermediaries can assist in the dissemination of statistical information in a number of ways:

- Their knowledge of the statistical process relieves statisticians of the difficult task of interacting with the ultimate users of information;
- By subjecting the data to thorough analysis, they provide additional constructive criticism of quality and presentation;
- They help statisticians assess demand for various types of data.

However, potential problems also exist:

- At times, intermediaries may misinterpret data without giving statisticians a chance to set the record straight;
- As result of their own vested interests, they may unwittingly distort the information passed on to statisticians about user needs for statistical information.

[94] 1980 *Handbook*, p. 25.

1. Providing users with information on the properties of statistical data

470. Professional statisticians and reputable statistical institutions are obligated to describe accurately and openly the strengths and weaknesses of the data they publish and to explain how much inference the data can support. Although there is no international consensus on how this should be accomplished, the statistical agency must be sure that its audience is properly informed regarding the following:

- Where data are to be located, according to subject and time period;
- How the data were defined and compiled;
- What quality is assigned to the data;
- What related data can be used for comparison or to provide context.

471. Very few agencies have invested the necessary resources to be able to provide this kind of information for all of the statistics they produce.[95] Nevertheless, if such metadata does not accompany the creation of data, creating it after the fact will require considerable investment. To meet the standards of good statistical organization, documentation of this type should be available for the entire range of series published.[96]

472. The burden associated with metadata projects may be reduced if a specific unit within the statistical agency is made responsible for ensuring that metadata is produced, that it adheres to a standard format, and that it is properly maintained and updated. It is important to bear in mind, however, that even if the responsibility is given to a specialized unit, the knowledge is derived almost exclusively from the substantive part of the statistical agency. It is important to differentiate between the need to produce metadata (irrespective of medium) for the entire range of statistical products, and the adoption of a system and protocol for recording the information. The latter is already a subject of lively international discussion but the former has not yet commanded such attention.

473. Advances in computer technology have fundamentally redefined both the demand and the supply of statistical information. The production and retrieval constraints that affected producers and users of data have diminished considerably. Rather than distributing summaries of available information and allowing users to select the data for which they require supplementary details, the statistical agency can provide the full range of data, to be stored by users, many of whom now possess the software and technological skills necessary to create their own summaries and analytical extracts.

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[95] One outstanding model of metadata documentation is that of the Australian Bureau of Statistics (ABS). Their data management component aims to improve client service through better catalogued, more visible and more accessible output data, integrated concepts and procedures. These goals are being approached through the development, loading and use of a corporate information "warehouse" that has facilities to store, catalogue and access all the output data produced by the ABS together with the metadata describing the underlying concepts and procedures.

[96] See appropriate references to the principles of good survey-taking in *Protocols for Official Statistics* Wellington, Statistics New Zealand, n.d., available from http://www.stats.govt.nz).

474. Technological advances have also resulted in a profusion of self-service data warehouses that are nearly impossible to navigate without a reliable guide, making the provision of high-quality metadata all the more critical. Therefore, the statistical agency cannot adopt a laissez-faire attitude, conferring upon the user the responsibilities of searching for, summarizing and analysing data, but must find an acceptable compromise that allows both parties to share in the work of "consuming" the data. There is no general rule for defining this relationship, but it is important to remember that users' appetite for metadata is limited, even if there is hardware available for storage and processing. Moreover, the capacity of non-specialists to handle large bodies of data is also limited.

475. Nonetheless, steps must be taken to heighten the probability that an increasing number of users who are provided with better search tools and are more demanding in terms of quality will find what they are looking for. Even if detailed metadata goes unused, the very fact that it is compiled and made available is reassuring for those who wish to see high standards of credibility upheld.

476. The balance between what can be physically made available and what is appropriate for users to have access to in view of the likely use is a matter to which the unit in charge of dissemination should pay close attention.

2. Dissemination policy

477. A statistical agency that lacks a well-defined dissemination policy risks losing its credibility as an independent agent. The following elements are essential to an effective dissemination policy:

- A lease schedule that treats all constituencies equally, defined well in advance;[97]
- A clear policy to identify the information that should be made available to the press and the supporting detail that can be disseminated through statistical bulletins;
- A policy regarding the cost of accessing detailed statistical information.[98]

478. Statistical agencies have become increasingly aware of the benefits of a predefined schedule of statistical releases. It is better to work according to a timetable with conservative deadlines than to work too fast and be perceived as unpredictable. Alternatively, if news is released later than usual and is more favourable than expected, the statistical agency could be perceived as operating under political influence.

[97] According to the Special Data Dissemination Standard (SDDS) established by the International Monetary Fund, "the monitorable elements of the SDDS for access, integrity for access, integrity, and quality emphasize transparency in the compilation and dissemination of statistics. To support ready and equal access, the SDDS prescribes (a) advance dissemination of release calendars and (b) simultaneous release to all interested parties". Available from http://dsbb.imf.org/overview.htm.

[98] See chapter XI, section C.

479. For many users, the one line that encapsulates the entire measurement process (e.g., "last month the CPI continued to increase at the rate of ten per cent per annum") is more important than the factors that explain the news. Since it is usually the media that provide such summaries, they must be made aware of the significance of the data and of the relevant metadata. From the point of view of others, including the statistical intermediaries; the explanatory factors and supporting data play an important role in their efforts to explain the underlying forces of change and to foresee future changes. Again, statistical agency should have a clear policy regarding the selection of data for distribution to the press for mass consumption and the body of data that, because it is more detailed and results from a finer cross-classification, appears some time later in a statistical bulletin (in electronic or conventional form).

480. The growth of the Internet has blurred the edges of what used to be a fairly straightforward policy. In theory, nothing should stop a statistical agency from placing all available information on its web site and managing access through the Internet rather than in more traditional ways. By "drilling down" (moving through a succession of folders and files), users can get to the detail they find appropriate to their concerns, with the added advantage that the technology allows them to leave a trail of the items they have accessed.

481. The unit in charge of dissemination in a statistical office should be aware that technology is rapidly loosening the constraints that used to affect its activities. Tracking technological advances has become almost as important as conducting studies of user needs and satisfaction.

B. Different forms of dissemination

1. Traditional means

482. Although there are many options today for disseminating information, such standard forms as bulletins, digests, abstracts and yearbooks are still in use. Throughout most of the last half century, most established statistical offices adhered to the pattern of producing a yearbook (see section E, "The statistical yearbook"), a monthly or quarterly digest, and the occasional specialized publication if its readership could be readily identified (foreign trade statistics, for example). Both the yearbook and the digest covered virtually every activity in which the statistical agency was engaged.

483. The organization required to support this form of data dissemination was equally straightforward. Each substantive unit looked after the compilation of a special branch of statistics (e.g., price statistics) that would be featured in the "digest" and the "yearbook", respectively. Each unit was responsible for the accuracy of its data and for the relevance, consistency and form of the accompanying footnotes. The unit would also be available to answer specialized queries that could not be handled by the editors of the publication.

484. At the agency level there would be a unit in charge of dissemination, including such activities as identifying readers, defining the form of the publication, providing timetables to contributors, ensuring that the printing process worked according to

schedule and handling distribution and subscriptions. This unit would also be responsible for interacting with the subject-matter organizations to ensure that they complied with the overall schedule of dissemination.

485. A number of large offices had their own printing presses; in several countries, the facilities available to the statistical office were among the largest and most sophisticated in the public sector. This form of organization is still viable, although modern forms of dissemination, in particular the use of the Internet, have opened up new possibilities.

2. Multimedia

486. Perhaps the most important change brought about by technological advances is the significantly diminished need to control large printing facilities. Statistical agencies now have the means to lie out their own publications and, for small printing runs, the tools to print everything in-house. In addition, technology has eliminated the need to print large volumes of statistical tables (typically those related to the censuses of population and to foreign trade statistics) by making it possible to provide the information in other ways.

487. Twenty years ago, the alternative to paper publications was to disseminate information using computer tapes, but this option was only open to the very small set of users who had access to a mainframe computer. Over the last two decades, access has become far more widespread with the proliferation of personal computers and floppy disks. In the last five to ten years, the practice of disseminating massive bodies of data via CD-ROM has been almost universally adopted. CD-ROMs allow information to be conveyed in a more imaginative way - mixed with sound and accompanied by processing software - and actually invite a greater effort to analyse raw data than any means of dissemination previously available.

3. The Internet

488. The advent of the Internet has opened up an increasingly large number of possibilities for both the providers and the users of statistics. Its main advantages are that it offers interactivity, versatility, speed and cost efficiencies, therefore enabling the statistical agency to greatly enhance the service provided to users.

489. The organizational implications of intensive use of the Internet for dissemination purposes are substantial. For example, the traditional two-tiered approach to publishing referred to above could be modified. Each substantive unit would be equipped to set up its own web page on the agency's web site as well as handle the interactive aspect of dissemination. A central unit would be in charge of releasing information to the press and would also have the power and the expertise to define (subject to higher approval) a "code of good behaviour" with regard to the contents and appearance of material posted on the agency's web site. The central unit would also be in charge of convening meetings to determine how users as a community were reacting to the range of outputs produced by the agency.

490. Another important organizational consequence is that the electronic file/database used to prepare the print dissemination could be used for the Internet version of the same publication. Close integration of content and presentation for electronic and conventional publications could also bring about substantial savings in the dissemination process. This means that an office is not necessarily tied to print media, as it may be suitable to offer only electronic versions of its publications whether they are on the Internet or on CD-ROM.

491. The delivery of time-sensitive statistics to users has been greatly enhanced by the Internet. The time lag between data collection and data dissemination by a traditional print media office is greatly reduced when these data are disseminated via Internet. In practice, Internet dissemination is usually possible around the same time as the print version has been finalized and sent off for reproduction and distribution. This will often allow users to have access to the statistics disseminated via Internet a number of weeks before they would normally receive the print version.

492. Many statistical agencies are finding that the Internet is ideal for releasing market-sensitive statistics. The Internet allows the agency to release the statistics in an orderly fashion; that is, one that allows equal access to the statistics for all users at the same time. In the past, facsimile transmissions have been used for this purpose, but users have been critical of this method.

493. The set-up cost of establishing an Internet service in a statistical agency has fallen dramatically in the past few years. This can be attributed to reductions in the cost of both hardware and software as well as to the availability of "off-the-shelf" software that can be used for a basic but very satisfactorily performing Internet site.

494. The cost efficiencies produced by disseminating statistics and statistical metadata via Internet are substantial when the Internet dissemination replaces established print or other physical products such as magnetic tapes or CD-ROMs.

495. The Internet enables statistical agencies to provide greater access to statistics and statistical metadata. In particular, the amount of detail that can be provided is not limited, as in print media, by the size of the page. Extensive statistical metadata can now also be provided as a matter of course to the user. Statistics and statistical metadata that has been archived by the statistics agency can now be made readily available to users. In addition, out-of-print statistics publications can also be made available to users of the Internet by providing scanned or other formats that preserve the document structure and layout.

496. Web browser technology is very sophisticated, which allows agencies to provide users with ready access to databases and Internet-based statistics dissemination systems. Web browsers now come with the functionality to recognize the file type and allow users to download statistics directly to their computers in comma-separated variable format (CSV), spreadsheet or other common formats.

497. The Internet has provided statistical agencies with a very useful way to test various ways of presenting statistics or tracking the popularity of its releases, as well as to

invite comments and get feedback on the adequacy of its data and metadata. In the developmental stage of a new database for the Internet, users can test the database interface for the statistical agency and respond to the designers in real time on such items as the layout of the interface, functionality, response time of the Internet connections to the database and general usability. This is very valuable to the statistical agency in pretesting the "product" before release. Once a service has been released, the statistical agency has the opportunity to keep in close contact with the users by including a feedback e-mail address on the web site. By providing this function, the statistical agency can get very useful suggestions on ways to better serve their clients.

498. The agency can also use the Internet to collect statistics and related metadata via HyperText Markup Language (html) forms, direct access to remote databases, File Transfer Protocol (FTP) to remote servers or e-mail submission. These methods are now commonly used, and the choice of method depends on the complexity of the task, the security required and the frequency of submission, among other requirements. Most recently, statistics agencies have been investigating the use of Extensible Markup Language (XML) to transfer statistics and metadata between statistics agencies and data suppliers and users. XML potentially offers substantial gains in efficiencies to both the statistics provider and user, as it allows standard transfers of structured data and metadata. The important point here is not to promote the use of XML - in fact, by the time the reader sees this book, XML may have been replaced - but rather that agencies will have new tools at their disposal, allowing them to collect and disseminate data and metadata more easily.

C. Recovering the cost of publication

499. Consistent with government "user-pay" policies, offices in some countries charge market rates for at least some of their products and services, whether or not the users are in the Government or in the private sector. In the Australian Bureau of Statistics, for example, the aims of the user pay policy are to encourage users to identify and address their real needs for statistics, to enable the demand for ABS products to function as an indicator of how the resources of the Bureau should be used, and to offset the cost of production of the statistics. In its view, the ABS has "public interest" obligations to ensure that at least basic statistics are both readily available and affordable; thus, it has been able to fund the ABS Library Extension Program, which comprises 529 libraries across Australia, providing them with free ABS publications to meet the needs of their communities.[99]

500. The issue is whether one should treat statistical publications in much the same way as a general government service (e.g., police force and national defence) or as a government service that users pay for each time it is utilized (e.g., toll roads, parks and museums). Furthermore, in the case of the latter, what is the appropriate price? The arguments vary according to government communications and social policies. The positions in the debate over user-pay policies include the following:

[99] *Annual Report 1996-1997* (Canberra, Australian Bureau of Statistics 1997).

- If a Government needs information to pursue its own ends - making better decisions, showing the electorate whether or not it has delivered on its pre-electoral promises—it will request the production of statistical information. The cost will be borne by all taxpayers and is part of the burden of providing good Government;

- The availability of information about the social and economic progress of a society is something to which any citizen in an open society is entitled and a responsibility that good Government must honour. Since it is not possible to legislate on how much information should be provided free of charge nor on the price to be charged for it, the only practical policy is not to charge at all;

- Since information has to be produced anyway to meet government needs, the most that should be charged to the user is the marginal cost of delivering information in a requested form and by a given date;

- It is manifestly unfair to place the burden of financing the production of highly specialized information, which gratifies the objectives of the few (e.g., researchers, historians, professional statisticians), on the shoulders of the entire community of taxpayers;

- It would be nearly impossible to base a fee structure on marginal cost. Accordingly, the average costs of delivery should be charged to all users, regardless of what sector they come from. There is no other equitable way to manage a cost recovery policy.

501. These issues have been the subject of lively discussion for some time, but no international consensus has emerged. Perhaps what can be said at this stage is that for those agencies in developing countries, where the major challenge is to get citizens to recognize the existence and usefulness of statistical information, the most pressing issue is not whether and how to obtain maximum revenue from statistical publications. In more advanced statistical agencies, where certain users have unique (and costly) specialized requests, there is a trend in favour of charging more than nominal costs for some information products. However, the implementation of a fee policy differs greatly from one agency to another.[100]

1. Commercial policies

502. In agencies that have embarked upon a dissemination programme with commercial overtones, either heavily dominated by the sale of a particular service or relying on the complete set of publications, the creation of a special unit involved with marketing and related activities is warranted. However, in other agencies research has shown that the commercial potential of statistical publications is limited and, therefore,

[100] See Report of the Forty-Fifth Plenary Session of the Conference of European Statisticians, 10-12 June 1997 (Geneva, Economic Commission for Europe, ECE/CES/52).

the creation of a special unit is not called for.[101] Of course, even when the commercial potential is limited or absent or when there is no special marketing unit, agencies still have the responsibility to investigate how they can increase the audience for their products.

503. A commercial policy requires several elements and, above all, a record of costs that could justify the prices attached to each publication if they were subjected to scrutiny on the presumption of monopolistic unfairness. The elements of such a policy are as follows:

- An algorithm to price special tabulations and a policy regarding subsequent requests for the same information by another user;
- An algorithm to price custom-designed surveys or additional questionnaires drafted to accompany existing survey questionnaires;
- An explicit and justifiable objective (e.g., recovering all costs associated with the production of camera-ready copy, printing and distribution, in the case of hard copy products, and a comparable set of costs for distribution via the Internet);
- A marketing plan including customer identification and needs;
- For larger offices, a separate marketing unit may have to be created or identified;
- A catalogue of all publications with their respective prices.

504. The unit in charge of marketing publications must fully comprehend these elements and objectives and be ready to deal with criticism from the sectors of the community that are the most affected by any set of commercially calculated prices.

2. Using third parties for dissemination

505. In a number of countries, third parties (in some instances private sector firms) have been contracted to take over the marketing of all or part of the statistical agency dissemination programme. This measure upholds the objective of gauging signals from the market for agency publications, eliminates the need to staff a marketing unit and releases the statistical office from the obligation to explain its pricing policies in the context of broad social goals. Naturally, such a programme only makes sense in an environment where there is an active market.[102]

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[101] In fairness to those agencies that have embarked on a commercial programme, their aim is not exclusively commercial. For example, charging commercial prices for print and electronic publications provides valuable market feedback to the statistical agency.

[102] Where alliances with private sector firms are tolerated or even encouraged, there must be a proper procedure to allow book dealers and publishers to take part in the process, and short-term contracts should be the norm so that the arrangements do not become obsolete with the passage of time and the availability of new technologies.

506. Before adopting solutions of this kind, however, senior officers in statistical agencies should be mindful that even the best of statistical publications do not have mass appeal and that many users will be quite content to share copies or to access them via libraries or other public collections. Experience suggests that the few publications with greater appeal include those on foreign trade statistics and those derived from the census of population.

3. Copyright and royalties

507. An important objective for an effective statistical agency is to disseminate the information it compiles as widely as possible and to make all possible efforts to get Government, business, researchers and the community at large to use that information. It therefore seems irrelevant or even contradictory to raise the matter of copyright and royalties in connection with official statistics. In fact, what is envisaged is to ensure by moral persuasion that intermediary users cite the source of the statistical information and include the caveats to which it is subject. Moreover, for those offices that market their information commercially, copyright is a measure designed to prevent users of statistical information from deriving personal profit from an undertaking that was collectively funded by the taxpayers.

508. A number of statistical agencies make use of the copyright mark and instruct all users to properly attribute statistical information.[103] It is not likely that any agency has taken legal measures to address improper use or attribution. Moral suasion is usually effective enough.

509. In the cases where it is obvious that intermediaries also frequently buy statistical compilations in order to support studies and analytical exercises, attribution may be insufficient and the payment of royalties may be in order.

D. Supplementing information with analysis

1. Should a national statistical office perform analysis?

510. No international consensus exists on how far a statistical agency should go in commenting on the meaning of the current figures and even less on how a set of figures recently compiled may relate to another set of figures compiled independently. To a certain extent, there is a convergence of opinion in the social and demographic fields, and several agencies prepare monographs on demography and various social issues. However, there is considerable hesitation about doing something similar with economic statistics. Arguably, nothing moves very fast demographically and, therefore, the commentators need not worry that what he/she says will change population trends. However, in the case of economic data, some ill-chosen turn of phrase could affect behaviour in the financial markets, raise serious questions about an economic policy adopted by the Government, and altogether bring about what a statistical office sets out never to do – to affect the real world with its apparent opinions rather than with objectively estimated figures.

[103] A standard note to this effect reads: "…No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form…" (Statistics Canada).

2. Facts and interpretation

511. There is not much controversy around the fact that, at a minimum, a statistical agency should comment on salient facts and use its inside knowledge to influence the impression created by aggregate figures if that impression is not supported by fact. For example, the hours worked in a given industry fell precipitously in one of the summer months when it was not habitual for this to occur. It turned out that the dominant firm in the industry decided to close down its plants earlier than usual for some technical reason and to send its workers on paid holiday. In a case like this, it is proper for the statistical agency to remove the alarm from the aggregates by commenting - without divulging who was responsible - on what caused the precipitous fall.

512. It is improper for a statistical agency to make normative judgments. For example, in commenting on recent measures of income distribution, a responsible statistical agency should not attach editorial comments about the latest changes in the tax structure and their regressive effect on the shape of the distribution curve. Nor would it be proper to couch the normative judgments in controversial assumptions or offer shaky evidence of causality. However, readers would probably benefit greatly if the statistical agency, in reviewing the condition of the housing market, for example, were to remind readers that the number of starts had fallen and that this fall coincided with a dramatic rise in interest rates, including mortgage rates. These examples are not prescriptive; rather they illustrate the posture of a statistical agency that is consistent with its position of objectivity and neutrality.[104]

3. Analytical functions and information

513. If the chief statistician decides routinely to add analytical comment to the release of figures - social or economic - some unit within the agency must be put in charge. If the efforts of the agency are at all effective, the media will get into the habit of reproducing the official comments and keep them separate from evaluations of the figures produced by other makers of public opinion. In order to ensure that they are in a position to explain what the agency comments mean, media representatives are likely to seek a contact within the agency. If the chief statistician decides not to take on the additional burden of being the regular interlocutor with the media (although in smaller offices this might be advisable) he/she should designate very clearly the official spokesperson. This will prevent any confusion that might result from different opinions being given by various professionals within the same agency. In offices with more analytical activity - perhaps resulting from deep examination and review of a survey or related bodies of data - responsibility might be assigned not to one person but to an entire analytical unit.

4. Review of publications

514. In spite of precautions and training administered to the official spokespersons, errors in judgement may occur. In order to avoid embarrassment, the statistical agency should take additional precautions. For releases that require swift publication to be useful,

[104] See chapter IX, section A for additional remarks on the nature and functions of analysis in a statistical agency.

a process of collective review that engages the more senior officials of the organization and fosters cross-subject review and criticism should be put in place. A release of statistics on employment and unemployment can be effectively reviewed, for example, by those responsible for industry and trade statistics or the national accountants. Although performed on a regular basis, review of this type should not demand an excessive amount of time.

515. A second process would be reserved for longer-lived efforts - for example, those connected with the series of analyses generated by a new survey of family incomes and expenditure, a new economic census or a new census of population. Given the time scales used for such exercises, it is appropriate to institute a formal process of review. Persuading members of the academic profession to take part in the process would be of added benefit. The mission of the review process would be exclusively to judge whether the statements made are fully supported by evidence; whether the most important inferences on the basis of the new data available were taken into account; and whether the methods used stand up to scrutiny in the face of current knowledge. There is, however, a component of this review that should not be overlooked. This consists in making certain that nothing improper is said in the analysis, given the statistical agency's political and legal context. This latter qualification is important. For example, some statistical offices are responsible both for the compilation of statistics and for economic studies (or analytical exercises). Other offices do not have this extended responsibility. It follows that what would constitute administrative "trespassing" of responsibilities in one country would be the expected duty of the organization in another. The judgement concerning what can be said is one that must rest squarely with the chief statistician or someone directly delegated by him/her.

E. The statistical yearbook

> "In view of the approaching [creation of a great many new provinces], and the prospect of their extending their commercial relations with each other and with foreign parts, a hand-book of common information respecting them seems to be required".[105]

516. The physical entity called a yearbook may turn out to be a relic of the past, made obsolete by the possibilities opened up by modern computer and telecommunications technology. However, for many decades, the statistical picture of a single country has been available from its yearbook, and the corresponding picture of the nations of the world has been available from the set of United Nations yearbooks.[106] If one wishes to learn all that is important about a country in a quantitative sense, one can consult these yearbooks, the value of which lies in the breadth of information and variety of perspectives presented. An alternate point of view is that the activity of a statistical office should be to provide relevant answers to specific questions.

517. Leaving aside the matter of whether the statistical agency publishes a volume of statistics called the "yearbook" or creates a well-designed web site in which all relevant

[105] Arthur Harvey, ed., *Year-Book and Almanac of British North America for* 1867 (Montreal 1867).
[106] For example, the *Demographic Yearbook*, *Energy Statistics Yearbook, Industrial Commodity Statistics Yearbook*, *International Trade Statistics Yearbook*, and *Yearbook of the National Accounts Statistics*.

information describing the country can be found, the merits of producing a yearbook include the following:

- It provides an occasion for a review of the relevant information that describes a country;
- It clarifies the need for integration in the statistics that will be selected for the yearbook;
- It reveals gaps in the available information, thereby suggesting the new initiatives that should be taken to complete the description of the country's social and economic fabric;
- In the case of decentralized systems, it is yet another means of promoting coordination among statistical units in different government departments;
- It is an ideal pedagogical device to introduce children to the physical, political and human geography of their country.

518. Opposing these considerations are the fears that the yearbook will become an end in itself, of little value to the constituency for whom it is intended, and that its contents will be excessive for those in a hurry and insufficient for those who wish to deepen their knowledge of a particular subject.

519. To a great extent, the development of the Internet has changed the basis for many of these fears. The economics of producing a yearbook (the most daunting aspect of the initiative for many years) have changed radically. The greatest innovation is that in many instances it is no longer necessary to print the yearbook, or it can be printed on demand. Other considerations are almost as important. The pages of the yearbook can be updated much more quickly. And the yearbook can easily be produced in a number of modes depending on how much coverage and detail are required, as in the case of the better-known dictionaries.[107]

520. Whether the statistical agency opts for a yearbook or an abridged volume - made available in all of the country's embassies abroad and designed to inform the potential foreign investor or tourist - or whether the matter is handled through the Internet, the initiative to produce a yearbook requires a structure (i.e., a department or unit). That structure is not so different from the one envisaged for the marketing of statistical publications. It consists of a coordinating body entrusted with the responsibility of defining contents, setting deadlines, handling distribution (or delegating that responsibility to a dedicated marketing unit), planning the future evolution of the yearbook, pointing out contradictions or ambiguities in the data and, if required, ensuring

[107] For example, some editions of the *Oxford English Dictionary* are published in several formats: the *Concis*e (one volume.), *The New Shorter* (two volumes.) and the full publication (now 20 volumes). In fact, some statistical agencies already follow this model and have an abstract, an intermediate publication, and a pocket-size abridgement.

liaison with other departments of Government, where other producers of statistics can be found.

521. Perhaps the most difficult challenge for the coordinating unit is to ensure that the contributing departments do not dismiss the exercise as someone else's responsibility for which they are not accountable. A system of links operated through the yearbook's web site might place users in more direct contact with contributors and stimulate their interest.

Conclusions

A statistical agency must strike a balance on two matters of relevance to its dissemination policy: (a) how much interpretation and analysis should be left to intermediaries; and (b) how much metadata it is important to publish. However, there should be no compromise with the obligation to treat all users equally by giving them simultaneous access to data. It greatly strengthens the hand of a statistical agency if it issues and adheres to a schedule of publication release dates. In addition, a dissemination policy should define the cost of accessing detailed statistical information.

A statistical agency must strike a balance between an increasingly general policy on the part of Government that calls for users to pay for certain classes of services and its duty to make official statistics as accessible to the community as the budget permits. It is possible to sub-contract some or many of the functions associated with marketing, but this still leaves open the matter of sales versus free distribution. There is no international consensus on where the boundary should be drawn.

The dissemination activity is not complete if it is not underpinned by an examination of "what the figures mean". This examination must be conducted in the most neutral and objective way possible but should not degenerate into a mechanical summary of facts. At a basic level, the statistical agency can bring to bear its knowledge of unique events that affect publishable aggregates. At a higher level, it can use its cross-subject knowledge to show the interdependencies among data and social processes. In doing so, particularly in the economic field, a statistical agency will take some risks. These risks consist in trespassing on the turf of other sectors of Government that are better equipped to comment on current developments but at the same time may be somewhat less neutral. To avoid adverse consequences, review processes should be put in place, involving the chief statistician if necessary.

The publication of a yearbook - in conventional or electronic form - is the best method for selecting the most important statistics required to describe a country and its economy, society and environment. A yearbook is also helpful in examining existing gaps in available information.

XII. RESPECTING PRIVACY AND PRESERVING CONFIDENTIALITY: HONOURING THE CONTRACT

A. Respondent policies

522. Perhaps the most important issue in developing a respondent policy is that a statistical agency must earn the public trust by treating respondents with respect, not just a means to reach its statistical goals. It is important to remember that, even in the presence of laws that make response to one or more data collections mandatory, participation by the public in statistical agency surveys is a largely voluntary process. Even when the survey process is not voluntary, an agency still has an obligation to treat respondents in an ethical manner: that is, minimizing the burden on their time, respecting their privacy and maintaining the confidentiality they were promised when they provided the information.

523. Respect for privacy is an acknowledgement that it is the individuals who "own" the information about themselves. According to the concept of privacy, it is the individual who decides what information is made available, when it is to be released and to whom it is released. Laws requiring the disclosure of this private information for statistical purposes are enacted only when there is an overriding public need for the information, and they contain provisions to protect from disclosure the identifiability of the data. This concept also to applies legal entities such as corporations. Public corporations, of course, agree to the regular disclosure of information such as sales and profits in order to participate in a regulated stock market. Private or closed corporations are required to make far fewer disclosures.

524. Ensuring confidentiality is the appropriate response from the statistical agency when it obtains private data. It is a pledge to honour the contract between the respondent and the agency when the respondent provides private data. The present chapter considers the elements of this contract and the means to protect the data when it is obtained from respondents.

525. It is critical to develop policies designed to create a cooperative frame of mind on the part of the intended respondents. Listed below are the elements of such policies, followed by an interpretation of each of these elements.

1. Principles of respondent relations

526. There are two broad classes of respondents: businesses and individuals, or households. Certain principles apply to both; others are unique to the business community. Items (a) through (e) are applicable to both cases; (f) and (g) apply only to businesses.

(*a) The purpose of the data collection must be clear and meaningful to the respondent*

Helping respondents understand the reasons for collecting the data is often a difficult task, and the application of this element is particularly difficult in the case of small businesses. The overall framework within which data is collected prevents the statistical agency from taking frequent censuses. Indeed, in the interest of efficiency, it is best to take samples no greater than what is strictly necessary to yield aggregate totals quickly and accurately. However, a small business is typically interested in the locale in which it operates and in its narrowly defined type of activity, neither of which can be adequately represented by most statistical undertakings, with the exception of a census or a comprehensive large-scale survey. For either class of respondent, any explanation of the purpose should be as clear and convincing as possible.

(*b) The statistical agency must be perceived as holding in the strictest confidence all individual records, protecting them from any other party inside or outside Government*

This assurance has to be delivered in a way that makes respondents feel confident.[108] The assurance itself consists of two elements: respondents must be made aware that the information held by the statistical agency cannot be accessed by someone with malicious intent,[109] and that the law recognizes that confidential information held by the statistical agency cannot be shared with the political authorities of the country, with regulatory agencies or with the civil service engaged in policy development. In a number of countries, specific reference is made to the fact that information submitted to the statistical agency cannot be subpoenaed by the judiciary.

(c*) The statistical agency must be seen as willing to accommodate respondents, either by providing additional explanations or by accepting legitimate substitutes for a traditional questionnaire*

In the case of business statistics, the statistical agency should not only be aware of how businesses keep records, but it must also be willing to go out of its way to recover the information it needs with minimal effort on the part of the business. For example, a shareholders' report that includes all or most of the variables sought by the data collector should be an acceptable substitute for a completed statistical questionnaire.

(d) The professionalism and objectivity of the statistical agency, as well as its freedom from political interference, must be established, accepted, and continually advertised

In approaching respondents, a statistical agency ought to request no more

[108] Cases have been recorded in which businesses explicitly stated that they would prefer that even routine information be collected by the national statistical agency, on the grounds that all information provided would be safe from inspection by unauthorized parties.

[109] Of course, this assurance can only be given within limits, but the public must be assured that it would be extraordinarily difficult to penetrate the defenses put up by a statistical agency.

information than is necessary and only after it has determined the least burdensome way of acquiring the information. The request is backed by the agency's reputation, specifically in the sense that the methods it employs to achieve results protect its autonomy and freedom from political interference.

(e) The statistical agency should be perceived as thoughtful and concerned in matters relating to response burden; that is to say, it should be committed to finding means that will simplify the paperwork burden

Generally, it should be understood that the statistical agency will approach a respondent with a request for data only as a last resort, all alternative avenues having been reviewed and found insufficient. An agency that desires to be known for a reasonable policy on matters of response burden will see to it that data collectors have understood thoroughly the meaning of this last element in the policy. In particular, the agency must demonstrate:

- That at all times the statistical agency closely monitors its information gathering activities;
- That the statistical agency has taken into account the intrusion and the violation of privacy necessarily implied by its efforts and that the result is a careful balance between respect for privacy and the minimum information required to enlighten public discussion;
- That the information collected will not be misused;
- That it can measure the extent of the burden it imposes, and that, through the application of its policies, this burden will be reduced.[110]

527. In addition, there are two principles that apply only to the business community:

(*f) The way in which the information is collected must reflect the ways in which businesses keep records*

Successful collection involves the capacity to transform the records held by businesses into the standard records required by the data compiler. However, it is the statistical agency that must make the effort, not the businesses. The extent to which the information can be transformed without distortion can be gauged if the data collector understands how businesses keep records. In general, it is advisable for a statistical agency to a sufficient number of employees with a thorough understanding of business accounting and bookkeeping. Ultimately, an effort should be made to convince businesses that it is safe to share confidential information with the statistical agency.

[110] In some agencies there is an actual annual calculation of total burden imposed on business. This calculation serves as the basis for an official report to the Government on reduction of the total burden over the past year.

(g) The information collected should employ the same terminology used in daily business operations

It is important to distinguish between the language used by statisticians to communicate among themselves and the language required to communicate with the intended respondents. Such expressions as "kind of activity unit" and "net profits" have little meaning outside the context of a statistical agency. The language to be used in order to elicit information must be the language that is familiar to the respondent, whether a household or business.[111]

528. A statistical agency, however, is not the only agency that collects information. Indeed, the Government collects detailed information from the public in a variety of ways and for many reasons. For example, detailed balance sheet information is collected in order to levy taxes and administer subsidies; and detailed commodity information is collected in order to administer laws and regulations that deal with health and safety.[112] The statistical agency should be among the most vigorous pursuers of paperwork reduction, using the information collected by others whenever there is an opportunity created by law and by overlap in content. It should be able to demonstrate to the public that it communicates with other government agencies regarding the means available under the law to prevent duplicate requirements, particularly from those businesses that are least equipped to fulfil them.

2. Compulsion and voluntary response

529. The nature of the law differs from country to country. In some, compliance with statistical collection is simply obligatory. If respondents - businesses or heads of household - do not provide information in the form in which it is requested and in a timely fashion, they are in violation of the law. In other countries, requests for certain classes of information are supported by legal requirements, whereas others are made on a voluntary basis. Finally, there are cases where the law is ambiguous on the subject. When this is true, the statistical agency may be fearful of demanding too much information: if challenged, the law might rule that no information is to be demanded compulsorily (other than that sought by the census), and the resulting publicity might adversely affect response rates.

530. The situation in most countries is probably representative of the second case, in which the law recognizes a restricted set of compulsory surveys. Whatever the legal basis, all agencies find that the most important objective is to secure a cooperative

[111] The Australian Bureau of Statistics engaged in a comprehensive attempt to rewrite its questionnaires for business surveys in the language "used by the trade". The investment required to do this is considerable. But even if it does not bring about a perceptible increase in response rates, it is likely to help reduce response error.

[112] Two exercises conducted at different times in two different OECD countries revealed that the amount of paperwork imposed by statistical collection when compared to all paperwork imposed by Government did not constitute much more than 5 per cent of the total.

attitude on the part of the respondents, particularly from small businesses and households.[113]

531. If an option is available, the statistical agency may adopt a moderate stance, wherein economic inquiries are compulsory and all others are voluntary. Irrespective of the legal posture, it is important to remember that without a cooperative attitude, no amount of compulsion will alleviate the response problem.

3. Incentives and assurances

532. A problem that has been increasing in many countries is that of low response rates in data collections. One of the potential solutions has been to provide incentives to respondents. However, incentives cannot always solve the problem. In some countries the use of financial incentives is illegal. In other cases, the budgets are too tight to allow for the provision of significant incentives. Moreover, if incentives are offered to respondents (e.g., householders), there must be some relationship between the time required of them and the nature of the compensation. For some inquiries the matter is trivial. For example, in the case of attitudinal surveys or continuous surveys, the cost to the householder is the periodic intrusion into the household's private affairs. In other cases, particularly for surveys of consumer income and expenditure, the effort required from the household is considerable.[114] Finally, the payment of incentives may create expectations on the part of respondents and make it difficult to conduct surveys without incentives or require ever-increasing incentives. The following are points to consider:

- The kind of incentive chosen must be significant but not excessive, so that it is neither treated with scorn by respondents nor looked upon as waste by those who determine the statistical agency's budget. The field organization must play an important role in providing advice on this matter;

- Whatever option is chosen, it is best to keep the householders who are surveyed informed about the reasons why incentives were or were not provided, about the image of the statistical agency, and of course, about the civic duty involved in the provision of information to aid in the discussion of matters of public concern.[115]

533. While incentives are most commonly offered to householders, they can also be useful in surveys of small agricultural operators and even of small, informal businesses. The same considerations do not necessarily apply to larger businesses, for which the provision of relevant information may be a forceful incentive in itself. For example, if the

[113] Generally, big enterprises will comply with government requests and will not request elaborate explanations as to why certain classes of financial and economic information are sought. There are, however, examples of transnational enterprises that are uncooperative in providing information outside the country where they are headquartered.

[114] There are many cases in which the survey of income and expenditure is combined with a survey of fixed and financial assets, and the details required from the household on its balance sheet and current and past transactions are such that not only must the household keep a detailed diary of its transactions but the interviewer, too, must spend a significant amount of time helping to complete the questionnaires.

[115] In invoking civic duty, the provision of private information is treated in the same manner as serving on a jury.

business information compiled in typical cases is comprehensive enough to be used in a regional breakdown, businesses operating on a regional rather than a local level will be interested in how their regional results compare to those of their competitors working on the same scale. Accordingly, the incentive of being provided with special tables making those comparisons - so long as the data have the right amount of detail and are reasonably current - may be sufficient to elicit constructive cooperation between the business community and the statistical agency.[116]

534. In all cases, however, the statistical agency must give uncompromising and explicit assurances that the information supplied will not disclose the identity of respondents. For businesses of any size, the combination of strong assurances and the recognition that the information solicited is necessary for the country to manage itself in an orderly fashion is sufficient. In other words, providing incentives in the case of business surveys is generally unnecessary (and, for budgetary reasons, is not in the statistical agency's best interest).

4. Sharing administrative information

535. The sharing of detailed administrative information with statistical agencies has many precedents. The most noteworthy is the case of customs administrations. However, income tax collectors, who are also collectors of massive amounts of information, are just as mindful of integrity and confidentiality as statisticians. Sharing information, particularly with tax collectors, is a delicate matter. Thus, if sharing is to take place, tax collectors must be assured that statistical agencies are at least as scrupulous as they are in the treatment of individual information. The following are some of the factors that the statistical agency ought to bear in mind:

- Whatever information is shared between statisticians and tax collectors must move in only one direction—from the tax authorities to the statisticians;

- In order to get the tax collectors to share information willingly and cooperatively, the statisticians should render some service to the tax authorities, one that does not sacrifice any of the vital safeguards on confidentiality;

- Information collected by the tax authorities is the single most powerful resource for reducing the response burden for small businesses;[117]

- Tax authorities are interested in classifying the forms submitted by tax filers according to their branch of economic activity but not necessarily in the same way as statistical agencies;

[116] In France, the National Institute of Statistics and Economic Studies (INSEE), has successfully pursued a policy of motivating businesses by the provision of custom-made tabulations, including specific comparisons between the business and its peers.

[117] An exception would be in countries where only a minority of the population pays taxes on income, so that it is not worth considering for statistical purposes.

- There is a substantial strategic gain if the industry classification of tax records is aligned with that used for statistical purposes;

- The public perception of statisticians classifying tax records might weaken any assurances given by statisticians about the confidentiality of the information submitted.

536. The challenge for the statistical agency is to find the best possible compromise among these factors without jeopardizing in any way statistical confidentiality. Whatever is found to work vis-à-vis the tax authorities is bound to work, with the occasional variant, for the other suppliers of administratively generated information.

537. In addition to the various guarantees that suppliers of administrative information require and that can be agreed upon by protocol and by verbal assurances, the statistical agency should give signs that the physical holdings of sensitive information are especially well guarded. In many statistical agencies where access to the premises is controlled, access by outsiders to the floors on which tax documents are held requires special authorization.

B. Data protection

1. Physical and electronic security

538. These days statistical agencies have two perimeters that must be protected. The first is physical - the actual location of the documents, computer records, microfiches, photographs and other materials. In this respect, offices with records housed in more than one building not only face a higher cost in protecting the records but also in persuading the public that what they do is consistent with the security of individual records. The second perimeter is virtual - the electronic perimeter traced by the agency's internal communications system, which is presumably connected to its stores of individual data.

539. Both perimeters need to be protected from malicious or unauthorized intrusion. As mentioned above, in many offices, access is strictly controlled (e.g., employees have to wear identification tags), and additional security measures are taken where the most sensitive records are housed.

540. The electronic perimeter must also be defended with password clearances and other types of security, but this is more difficult to accomplish, particularly as technology continues to demand upgraded defences. The popular media has given great publicity to successful attempts by hackers to penetrate even the most secure communications systems and gain access to the most sensitive information, in some cases involving national security files. Since the public is more apprehensive about computer security than that of conventional documents, and since this trend is likely to increase, a few statistical agencies have chosen to completely isolate the internal system of communications from the outside world, including from its own local offices.

541. In such agencies no direct link exists between the stores of data and communications to the outside world. Furthermore, whatever confidential data are

transmitted from local offices to the central office are protected by the best encryption system available. Whether or not this solution will provide sufficient protection in the face of rapidly evolving technologies cannot be foretold. One of the agency's systems analysts should be placed permanently in charge of data security, with responsibility for such matters as encryption; removal of identifying attributes; and protection against malicious tampering with data files. In addition, someone should be assigned responsibility for the physical security of the premises and data holdings.

2. Sanctions

542. Some official regulation must outline the sanctions imposed for security breaches, as a deterrent as well as to demonstrate to the public that the matters of confidentiality and integrity of data holdings are taken seriously. The most natural way of dealing with this is through the law itself. An ideal situation is one in which legislation clearly lays out the various types of infractions. Examples of these, in increasing order of severity, include the following:

- Carelessness**.** An interviewer leaves an envelope containing identifiable completed questionnaires on the bus, where it could be discovered by a third party and picked up by the press as an example of public sector laxity;

- Improper behaviour**.** A subject-matter expert comments in public about the income declared by a particular family when interviewed in the course of a household income and expenditure survey (the possible consequences are the same as above);

- Behaviour with malicious intent**.** An employee wishing to embarrass the management of the statistical agency sends the prime minister's census form to the press;

- Use of confidential information for personal profit**.** An employee offers to provide confidential information on a company to one of its competitors.

543. These, of course, are merely illustrations; the law can be more comprehensive about what constitutes a security crime. However, they illustrate the kinds of infractions that should be listed and for which there ought to be credible penalties.

C. Confidentiality and disclosure

1. Principles

544. The preceding sections have presented the precautions that are to be taken with incoming information, ways to prevent it from falling into the wrong hands and the disciplinary measures that should be taken when there is a breach of security. This section explores how the contract established with respondents must be honoured. It considers ways to prevent publication of aggregate data that would disclose information

revealing the identity of an individual, business or institution?[118] The risk of doing so increases with the publication's degree of detail. For example, it is customary to publish the results of a family expenditure survey by region, demographic characteristics of the respondents and income. Even in a survey incorporating tens of thousands of responses, the identities of respondents whose statistical data fall into extreme ranges (e.g., persons who are affluent and well known) might be easily identifiable.

545. The standard solution is to conduct initial research determining those cells in which it will be possible to identify respondents. In subsequent research, the minimum degree of aggregation required to suppress[119] respondents' identity is decided. Usually, this kind of research takes place at two levels. First, there is a purely practical, rudimentary attempt to eliminate the offending cases at minimum cost, carried out by trial and error. For those agencies that can afford it, there is also a more theoretical approach to identifying the offending cells and showing that the solution proposed is the least costly in terms of information suppressed. Since few statistical agencies are equipped to conduct such research, an alternative solution is to commission interested academics to devise minimum data suppression models. Of course, research results can be applied elsewhere, and smaller agencies are encouraged to maintain communication with large statistical centres, particularly on this subject.

2. Dominance and residual disclosure

546. A number of issues relating to confidentiality have been the objects of scrutiny over the past fifty years, and thus have become more prevalent with the diffusion of computer technology and the resultant expansion of the community of users. The increased capacity to store, cross-tabulate and publish statistical data has inadvertently created more opportunities for accidental disclosure. Moreover, users' ability to manipulate data has also increased and with it their ability to uncover more information than is meant for them.[120]

547. For each of its tabulations, the statistical agency must track how many respondents are included in each cell and how many are in each of the cells that can be calculated as a residual. Measures must be taken to disguise all those that have less than the threshold (three is generally the cut-off point). In those cells with a number of respondents equal or greater than the threshold, but with one or two respondents accounting for more than 90 per cent of the value of the displayed variable, measures

[118] There is an interesting question as to whether these are the only categories that must be protected. If we disclosed the average income of cardiologists, for instance, or the crime rate by ethnicity of the perpetrator, would that be a breach of contract? The matter of exactly what information ought to be protected has not yet been the object of careful examination.

[119] The term "suppress" is used to suggest, not that the basic information should be excluded, but rather that it should be kept anonymous. The solution is to combine cells.

[120] Suppose a statistical agency runs a tabulation service on demand, the object of which is to provide, in machine-readable format, tables derived from a complex survey. The general principle is that whatever is requested by one user is available to all. Let us also suppose that there are **n** users, and that each wants different cross-tabulations. It follows that a statistical agency would have to track the impact of the **n**th demand on the number of possible residual disclosures, assuming the **n**th user had access to the previous **n-1** requests.

should be taken to disguise their activity as well.

548. For offices with a significant publishing programme, such the work involved in tracking dominance and residual cases[121] justifies the creation of a special unit in charge of confidentiality research. Such a unit is usually a branch of (or is at least closely tied to) the department in charge of applications of mathematical statistics.[122]

3. Confidentiality and household statistics

549. While one person or household may be much like another, such large corporations as Sony, the Royal Dutch Shell Group, International Business Machines Corporation (IBM), the De Beers Group, Gasprom or General Motors are quite unlike small businesses. For this reason, a number of differences between social and economic statistics must be taken into account. In social statistics, the notion of dominance is relevant only in some surveys of household assets, income and expenditure. Furthermore, in the domain of economic statistics, any survey sample will typically include a certain class of units because they make up a large proportion of the variable, but families and individuals need only selection with non-zero probability. Lastly, with the exception of special surveys (e.g., the financial balance sheet of households), random perturbations can be introduced in the results of household surveys to mask individual cases without affecting the estimates of any of the moments of distribution. However, this is rarely the case with business surveys.

550. Recently, longitudinal surveys have raised a number of interesting issues connected with confidentiality research. These surveys, in which a selected unit (generally an individual or family) is tracked over time so that changes in its attributes can be observed, are becoming popular among some of the more advanced statistical agencies. The temporal aspect of this type of survey greatly increases the likelihood that the sample will be identifiable. However, minimum necessary suppression may render useless the delicate data analysis and presentation that such surveys demand. Clearly, research into the confidentiality of household statistics is vastly different from research on businesses, and should be treated as a separate item on the research agenda.

4. Disclosure with consent

551. In terms of public image, it is in the best interest of the statistical agency to position itself as the guardian of response burden, continually demonstrating its desire to minimize paperwork when possible. Accordingly, the statistical agency should aggressively pursue opportunities to use the regulatory powers of other parties to gather information, rather than duplicate the queries administered by other government offices. However, eliminating duplication may imply the sharing of information, which can work in two ways: the statistical agency obtains its information from the data that is collected

[121] For an overview of a tracking and suppression system, see Gordon Sande, "Automated cell suppression to preserve confidentiality of business statistics", in *Proceedings of the Second International Workshop on Statistical Database Management*, Los Altos California, 27-29 September 1983, Roy Hammond and John L. McCarthy, eds. (Lawrence Berkeley Laboratory, 1983).

[122] Such a department will normally be responsible for encryption research, among other tasks.

by the other government body, or vice-versa. When given a choice, respondents usually prefer to report to the statistical agency for a variety of reasons, the most important being its reputation for discretion and attention to detail. If it is possible that information will be shared, respondents must give consent (preferably in writing) to have their forms reviewed by a third party, and be made to understand why such sharing might occur. Respondents should also be made aware that while their refusal is absolute, the result might be that they have to provide the same information twice.

552. There are other circumstances in which written consent for disclosure may be sought. In highly industrialized countries, the analytical tables for industry (the input-output tables, for example) can lose their value if disclosure rules are interpreted to the letter. Before accepting a sacrifice in the analytical value of its compilations, the statistical agency may wish to seek consent from the businesses that run the risk of having their operations disclosed. These businesses would be asked to agree to a form of publication that affords imperfect disclosure protection. Of course, taking this step on any significant scale might jeopardize the statistical agency's reputation.

5. Forced disclosure

553. In certain instances, there is no feasible choice but to disclose the activities of a particular business enterprise. For the most part, this occurs with public utilities, State monopolies and industries that are dominated by a single firm, as is often the case in smaller countries. When the situation is well known and in fact precedes the creation of the statistical agency, a special clause dealing with it is written into the law. In annual statistics this is less of an issue, because State enterprises and large public monopolies are usually requested to report their activities and financial circumstances in great detail, and these reports are made public.

6. Passive confidentiality

554. It is not always possible to prevent all breaches of confidentiality. The most obvious example is that of international trade statistics. In this case, the data collected is pertinent to recorded transactions rather than the individuals or businesses responsible for them. As these statistics constitute a census of transactions over the period of reference, are published in extremely fine detail and include several attributes (what is exchanged, its destination, means of transport, points of entry and departure, and so on) it is not realistic to assume that total confidentiality can be maintained without having serious effects on the timeliness and utility of the information provided. The customary approach is to opt for a mixture of active and passive disclosure protection. For all cases where it is known that there is only one importer or exporter,[123] or a case of dominance, suppression measures are devised and implemented in advance. For all other cases, suppression measures are taken only if a business or individual takes the initiative and complains to the statistical agency. If the agency is accused of failing to act on the matter in a timely

[123] This approach works asymmetrically. In most countries there are many more importers than exporters. The latter can be more easily identified ahead of time, and pre-emptive measures can be taken to suppress identifiable information. However, any business can be deemed an importer, and therefore a priori decisions are more difficult to make.

fashion, the respondent should be made aware that, unlike situations in which the statistical agency designs and administers its own surveys with the means to detect disclosure a priori, international trade statistics employ records compiled through an external administrative process and are not the direct responsibility of the agency. Therefore, it can only act when notified.

7. Arrangements for research

555. Under certain conditions and by their own decree, statistical agencies may order the publication of the names, addresses, industrial activity (expressed in the form of an industrial code) and size (expressed by a code denoting an employment size class or some other agreed variable, also by size class) of selected business respondents. Generally, such an exception is made for research purposes.

556. Increasingly, there are perfectly legitimate applications that not only employ statistical aggregates, but also depend on individual data for their success. For example, the study of complicated interactions between consumer income, expenditure, household savings and taxation through the examination of published statistics tends to suffer greatly from aggregation bias. The testing of formal hypotheses can be more readily conducted on the basis of individual longitudinal records. Few offices are equipped to conduct this kind of research themselves. It follows that in this situation, the common interest is best served if the statistical agency provides researchers with the information they need and allows them to formulate hypotheses and conduct the necessary research effort.

557. Today, circumstances exist in which a statistical agency cannot avoid providing microdata. However, an accessible database with individual information should be constructed in such a way that the probabilities of identification with certainty are extremely low or non-existent. Of course, all records must be made anonymous, and in addition, there may be grounds for introducing random perturbations so long as the moments of the original distribution are preserved.[124] Even after all these precautions, it is necessary to have an officer oversee access to the database and the work derived from it. This means that at all times an agency official knows who is using the database and why, what they are looking for, and what results, if any, have been achieved so far. The agency must coordinate with users whose work is dependent upon particularly detailed sets of data, so that the general public is confident that such detail is provided only in support of meaningful advances in the social sciences.

558. It is difficult to envisage a publicly accessible database for business information, because each industry generally has an establishment or company big enough to dominate the results and be recognized by the extent to which it affects the data. However, with small businesses the situation may be different and, if there are questions relating exclusively to small business, the assembly of a publicly accessible database is justified.

[124] The subject of how to provide data that is non-identifiable but contains the same information as the original set is under active research. See, for example D.B. Rubin, "Multiple imputation after 18+years", *Journal of the American Statistical Association*, volume 91, pp. 473-489.

Note that while numerous examples of successful public-use databases exist for households, few have been constructed for businesses.

559. The research community places special demands on data that cannot be ignored, particularly when those demands are deemed to serve the public interest. Many of these legitimately require access to individual records or to cells in tabulations where the number of respondents is less than the threshold. Since such research is not carried out for personal gain or with the intent to secure commercial intelligence that might hurt established interests, it is difficult for the statistical agency to disallow it. Conversely, it is just as difficult for the agency to make exceptions for certain classes of users despite all the assurances given to respondents. Rarely does a statistical agency achieve an effective balance between the two pressures. The following section describes a solution that has worked in the context of a few agencies.

560. One method that has met with limited success in several countries is the formal recruitment of academic researchers who require access to microdata, even though their remuneration is merely symbolic. This procedure ensures that the researcher agrees to abide by the rules of the statistical agency and understands that failure to do so will result in official sanction. The following conditions would warrant this type of formal offer:

- The researcher has proper credentials;
- The research plan concerns matters that the statistical agency considers to be in the public interest or for the advancement of social science, and no alternative source of data is available;
- The researcher agrees to uphold the protocol and posture of the statistical agency for the duration of his/her employment.

561. Prior to making an offer of employment the statistical agency should ensure that the researcher meets the three conditions stipulated above, and may wish to consult its legal adviser. It is also important not to use this practice to circumvent the rules of confidentiality. Clearly, overuse, or use for projects that would appear trivial, could compromise the agency's credibility. A related issue, concerning control of the intellectual property resulting from the researcher's work, is beyond the scope of this handbook.

562. Another method, tested at the United States Bureau of the Census, consists in creating a "sterile chamber" where researchers can work. While they do not acquire the status of employees, researchers act in full knowledge of the statistical agency's confidentiality policies and accept the statutory sanctions should these be broken.

Conclusions

Statistical agencies are committed to safeguarding information that plainly reveals the operations, belongings, attitudes or any other characteristics of individual respondents. The principles behind this practice are fairly clear, but specific applications require ongoing research in order to certify that there is no breach of confidentiality. Theoretical research, while invaluable in that it can be shared and used repeatedly, is costly and is conducted in only a few agencies. However, even when such research is not possible, the more practical work of suppressing revealing information without compromising the integrity of statistical aggregates should go on at all times. These activities should be carried out openly as a means of reassuring the public.

Exceptions to the rule of absolute confidentiality do exist; when these occur, the statistical agency should be candid with the public and explicit about the conditions that warrant exceptional treatment. Household and business records are not treated in the same way, since the former are easier to disguise, whereas circumstances often arise in which the latter cannot be disguised without deleterious effects on the quality of published data. In such cases (e.g., in the case of natural monopolies or dominant enterprises), either a specific provision for disclosure is included in the statistical legislation, or else the statistical agency should not act without the explicit consent of the potentially identifiable party.

XIII. PUTTING IT ALL TOGETHER

563. The preceding chapters have examined all of the functions required for a statistical agency to perform effectively. Clearly, one of the most important points is that the activity of a statistical agency is constantly under conflicting pressures. Prudence and experience suggest that there is no ideal solution, but an effective model seeks to minimize the impact of negative elements rather than assume that they can be eliminated. Another major point is that most of the features covered so far apply to all statistical agencies, whether centralized, in the research departments of central banks or embedded in ministries that rely heavily on quantitative evidence. The present chapter brings all of the elements together into a schematic framework, further illuminating some of the arguments reviewed above. Chapter XIII also intends to strengthen the understanding that all parts of a statistical agency are interrelated and that the agency cannot work effectively without a sense of interdependence among all members of its staff.

564. The notion of organization invokes the idea of hierarchy. In order to be effective over time, organizations must clearly and unambiguously assign responsibilities. Indeed, the very creation of an organizational chart - with the limits that it imposes on each set of functions and responsibilities - suggests both interdependence and exclusivity. The interplay of these two principles favours a certain amount of stability and guards against excessive autonomy. Nevertheless, the preceding chapters have addressed at length the reasons why a simple hierarchy is insufficient, why it must be complemented by a non-hierarchical entity (for example, an internal committee), and why the statistical agency must be willing to sacrifice strict adherence to the hierarchical structure to adapt to external changes.

565. The reality is that statistical agencies must adjust to a changing environment and must do so in a timely fashion. To accomplish this, agencies must closely monitor technical, environmental and legal changes, and they should engage in an ongoing discussion about how their structure should adapt to changes over which they have no control. Just as change is constant, so should the evolution of priorities be constant.

566. Descriptions of an organization necessarily look at each component individually and examine its attributes and functions, as well as the factors that suggest that it be organized in one way or another. However, the more detailed those descriptions, the less one understands their part in an interrelated system.

A. Principles of organization

567. In an effective statistical system where all activities are successfully integrated, there are bound to be groups championing different sets of priorities. For example, one

group may uphold the view that the key activity is to ensure that user needs are correctly interpreted and provided for. Another group may insist that no effective performance is possible unless the appropriate respondents are identified and sufficient care is taken to make sure they understand the questions and give the best possible replies. A third group may argue that however successful the activities championed by the others, they are futile unless estimates are accurate and correct rules of aggregation are observed. In a truly successful agency the tension generated by these three conflicting views gives rise to a system of checks and balances that ensures the production of the best possible data.

568. The above description represents a static view of an effective organization. In practice, a statistical agency should be simultaneously adaptable and stable. Technical change seldom proceeds in a continuous and predictable fashion. For this reason, effective statistical organizations must scan the technical horizon and keep abreast of technological advances. If forthcoming technical changes are likely to affect the way statistics are collected, compiled and used, there will barely be time to overhaul the system before those changes overtake it.

569. The functions of a statistical agency can be described under four comprehensive headings:

- Functions required to ascertain user requirements and ensure that they are met (this implies sustained communication with those who are, or who could be, interested in statistical information);

- Those required to ensure that statistical information meets quality standards (this implies the ability to gauge the minimum standard of reliability necessary to guarantee both the usefulness and credibility of statistical data);

- Those required to determine, in conjunction with respondents, the least intrusive and most convenient ways of gathering basic information (directly, as well as from other agencies when possible);

- Those that allow the statistical organization to review and learn from its own practices.

570. These functions should be supplemented with others that ensure adaptability and uniformity of the products of the statistical process. Statisticians can use these criteria in evaluating the soundness of their organizations.

571. The most efficient internal organization is not one that strictly categorizes its staff by their various backgrounds and approaches to statistical activities. While some grouping of staff by function and professional background is necessary, total separation is inappropriate. When certain activities are not respected or careers get blocked on the basis of previous experience, the tensions that arise can severely hinder a statistical agency's performance.

572. Review and evaluation are crucial activities that should be undertaken by a dedicated part of the organization. The purpose of these two activities is to learn from past mistakes; to help purge the organization of attributes that have become obsolete or undesirable; and to impress upon users that the agency has not succumbed to inertia.

573. In order to increase the credibility of the systematic evaluation of a statistical agency's activities while introducing new perspectives, it is best if outside resources are co-opted for both reviewing and evaluating. This can be done through consulting contracts or, where applicable, as part of the regular activities of the network of advisory committees.

574. No prescription is available for the number of hierarchical levels any one organization should have. This is determined by those who design the organization and depends on such considerations as the scale of operations, what is considered manageable and the specialization of the staff.

575. There is no suggestion of a hierarchical set-up in the diagrams in annex III. (For an examination of how internal committees fit into this hierarchy, see chapter V.) Neither is there any suggestion that all the facilities (substantive and service departments) mentioned must fall within a single agency. Although this is preferable from a number of points of view, in many situations the cost of bringing it about is not commensurate with the resulting benefits to the user community.

576. The present handbook does not mention initiatives that mobilize resources for a relatively short period of time and are dissolved once their objectives are attained. Therefore, comments relating to the organization of the census of population are limited to the material presented in chapter IX.

B. Internal functions

1. Office of the chief statistician

577. The office of the chief statistician should carry out two kinds of activity:

- Leadership and management of the statistical agency by giving direction to its financial administrator, director of personnel and those responsible for its substantive programmes;

- Management of external relations, the most important of which are those concerning the ministry responsible for the agency, the key government counterparts, the country's legislative authorities, the media and the chief statistician's peers abroad.

578. Whether the chief statistician conducts these activities directly or through advisers is dependent upon personal preference and the scale of operations. There are large offices where a number of responsibilities are delegated to the chief statistician's principal advisers, and he/she is only called on when the matter at hand concerns the integrity of the office or of its database, related policy issues or the ministry in charge of the office.

579. Sometimes functions normally associated with the head of a statistical agency are put in the hands of a principal adviser. The adviser then takes on all matters related to personnel management (other than appointments at the highest levels) and matters associated with the day-to-day financial management of the agency, thereby allowing the chief statistician to tend to other concerns, such as the office's external relations. The chief statistician, however, remains responsible.

580. The function of the legal adviser tends to be linked to the chief statistician, irrespective of the way in which the office is organized. Of course, whether the legal adviser is on staff or is consulted on a regular basis depends on preference and availability. All cases involving matters of integrity (e.g., exceptions to confidentiality provisions or granting access to data before they are published, in exceptional circumstances) and for which the law is ambiguous require the judgement of the chief statistician, supported by the most reliable legal advice. Figure A.3 in annex III represents a possible structure for the chief statistician's office.

2. Dissemination

581. Advances in computer technology and communications have affected the way statistical agencies disseminate data. The statistical agency should constantly gauge market preferences regarding content, the medium chosen for delivery and the level of explanatory detail to be included with the data. To do so, it must maintain relations with principal user constituencies. The needs of users must then be communicated to the producer departments so that they may assemble data in the form best suited to user needs. Marketing concerns must also be taken into account, including determining the price of publications, maximizing their usefulness and ensuring the widest possible dissemination. In addition, there is the function of maintaining special relations with the media, which is the principal instrument for disseminating statistical information to the general public.

582. There are many possible ways to divide the tasks of the department in charge of dissemination. Figure A.4 in annex III suggests one possible model.

3. The field organization

583. The field organization is best organized on a functional basis, and should serve all of the subject-matter departments in the statistical agency. A sensible alternative to this form of organization is difficult to imagine. However, it is not uncommon for the field organization to have an internal structure that manages household and business inquiries separately.

584. If the statistical agency relies heavily on administrative data, the field organization may look after those records as well, in the interest of efficiency. Obviously, in this case the principles behind functional organization and subject-matter organization come into partial conflict. A possible structure for a field organization is shown in annex III, figure A.5. This example includes collection activities based on administrative records, but shows them as a separate department within the field organization.

585. The field organization performs the following functions:

- Maintaining contact with respondents;
- Explaining credibly to respondents the purpose of a statistical inquiry, securing cooperation, and retaining respondents' goodwill throughout;
- Providing feedback to the rest of the statistical organization regarding: (a) the quality of the frame after it has been tested in the field; and (b) the receptivity of respondents to a particular statistical inquiry and the instruments used to conduct it;
- Taking charge of the initial editing of the information collected. There is no set boundary between the responsibility of the field organization and that of the subject-matter departments. Efficiency, training, and the individual perceptions of the subject-matter departments among other things, play into the way work is delegated. However, it should be kept in mind that the closer one is to the respondent, the easier it is to correct errors;
- Researching effective methods of data collection, including necessary adaptations of questionnaire and classification standards, techniques of persuasion, incentives and deterrents.

4. Subject-matter departments

586. Subject-matter departments perform a number of unique functions that are difficult to delegate precisely because they are specialized, concern a well-defined set of users, and often an equally well-defined set of respondents. In broad terms, the functions of subject-matter departments are as follows:

- To assess user needs and the most cost-effective way to meet them, as well as to forecast the direction in which those needs are evolving;
- To have an action plan on the best method for collecting relevant information, given the additional constraints imposed by limits on paperwork generated by government agencies;
- To balance the special requirements of users with the constraints imposed by the use of standard definitions, international norms of classifying and accounting and the specific needs expressed by those who compile the macroeconomic accounts;
- To document the quality attributes of the data produced and make the results accessible to both researchers and the general public.

587. In practice, relations with key users in Government should be considered a distinct function simply because of the disproportionate amount of contact they require. What follows is an overview of the structures necessary for the subject-matter department

to carry out its functions in a number of different statistical domains (see figure A.6 in annex III).

588. Basic statistics constitute the raw material a statistical agency works with. The subject matter-unit can be organized in a variety of ways. One is by source (business, household, institutions and public sector); this method of organization has the merit of coinciding with the structure suggested for the field organization. Another alternative is to organize the subject-matter area by user constituency. This possibility has the merit of coinciding with the structure of that part of the agency responsible for such activities as marketing and anticipating user needs. The subject-matter unit can also be structured by process. For example, it can be made up of one department that specializes in surveys of business accounting records, another that deals with brief monthly surveys administered to businesses and households alike, and so on.

589. The most stable and robust structure embodies all these considerations. Accordingly, it is typical to find structures in which a distinction is made between household and business statistics (source of information) as well as between microeconomic and macroeconomic statistics (user constituency). The proportions of the mixtures vary but it is unlikely that any structure can be based on a single criterion.

590. There are additional alternatives on how to divide each of the major substructures. For instance, one way of dividing basic economic statistics is by industry (with departments in charge of forestry, agriculture, mining, manufacturing, construction, transportation, distribution, communications, etc.). While such a division is appealing, it leaves some major issues unresolved. For instance, consumer prices, exports of goods and services, investment in machinery and equipment, industrial and commercial employment, and expenditure on research and development are all important to the explanation of changes in GDP, but they cut across all industries.

591. The difficulty in using a single criterion to create substructures exists for social statistics as well. For example, one might conceive of a division based on the source of information (institutions concerned with education, health and welfare). However, such a distinction would not work well by itself. Within the category of health there is interest simultaneously in the activity and effectiveness of the health provider (hospitals and clinics); in the outcomes of health activities (patients as part of households); and in the technologies used (results of research and development expenditures). Clearly, the most effective way of dividing labour in the area of social statistics is to take several criteria into consideration.

592. When organizing an office, the major effort is to emphasize relevance, adaptability and a demonstrable understanding of user needs, the most effective division of labour is one in which the departments are defined by user constituency (in this case the division can mirror the way the Government is structured). Such a classification is particularly important for industries such as those involved with energy, transportation or agriculture. However, in some cases there is hardly any room for choice. When the information source is unique and dominates all other activities relative to the subject (e.g., international trade in goods, for which the national customs administration is the

source of the vast majority of documentation), little opportunity exists for combining it with other matters. In other cases, the possibility does exist; for example, price indexes in general, and the CPI in particular, are based on a combination of method of compilation and source of information.

593. For certain statistics that cut across all sectors and all industries, there is some choice in how to best organize them. One example is statistical information on the demand for labour and fixed equipment. The statistic on the demand for labour comes from business and public sector surveys, but its supply is estimated through household inquiries. If the two are split according to the source of information, much of the significance of the broad division of statistics into social and economic areas would depend on the placement of the household surveys of the labour force.

594. It is difficult to take sides on this matter since the arguments are so complex; in the end, personalities and a sense of internal balance play deciding roles. It is possible to imagine an organization in which the heads of each unit depicted in figures A.5, A.6 and A.7 (see annex III) are at the same hierarchical level and are all under the supervision of the chief statistician, as well as one in which the units belong to different groups and only the head of each group reports to upper management.

595. Figure A.7 in annex III gives a more detailed view of a possible way to organize the department of basic economic statistics. The distinctions drawn are merely put forward as an example. The following considerations underlie the suggestions:

- With respect to activities represented under industry statistics, what is sought is information about their cost structure, their gross value of production and the elements that make up value added. The adjusted sum of the values added should be a subtotal (after a few conceptual adjustments) in the national accounts;

- Some industries are direct counterparts of a ministry, which may have its own statistical branch and/or generate information for statistical purposes as a by-product of its administrative or regulatory activities. A suggested grouping for those industries places them under the heading “Industry statistics: group 1”. The others are part of group 2;

- The three activities grouped under the heading “Economy-wide basic economic statistics” are sui generis. They rely on a unique source of information (e.g., international trade) or a unique technique (e.g., price indexes) or on a wide variety of sources and special circumstances (e.g., installation of capital equipment).

596. Figures A.8 and A.9 in annex III indicate possible structures for social and household statistics and for the department dedicated to labour. The considerations that underlie the models are similar to those stated above. In other words, strategic reasons may exist to consolidate all labour statistics into one organizational unit, not because of homogeneity of methods or sources but rather to interact more effectively with the ministry of labour. Similar thoughts may dominate the decision to consolidate the

production of all statistics related to health and education so as to simplify contacts with powerful ministries that may have their own statistical branches.

597. There is no standard way to organize macroeconomic statistics. In many cases, they are estimated by the research departments of central banks or by specialized departments in national ministries of finance. However, they possess certain unique attributes that should influence how they are organized, as explained below:

- Macroeconomic statistics are not the result of direct measurement. Rather, they are jointly derived from basic economic statistics, public accounts and accounting identities;

- The chief concerns of the national accountant and of the balance of payments compiler include the balancing properties of the system, differences between the various accounts and estimation procedures for incomplete elements;

- Balancing supply and demand for each industry, required for the estimation of total supply (GDP), will necessarily result in unexplainable differences and gaps. Review of these differences constitutes essential feedback for the managers of basic economic statistics;

- The relative strengths and weaknesses of the basic data as revealed through the balancing exercise are critical elements in the formulation of any development programme for basic economic statistics.

598. Given the above characteristics, two propositions follow:

- Compiling the macroeconomic accounts is effectively a full-scale analysis of the quality of the basic economic statistics that comprise them. Accordingly, it is best managed by an independent department;

- The concerns of those compiling the national and international accounts are so analytical in nature that it may not be the best of use of their talents if they take part in conducting statistical surveys or negotiating with other government departments over the provision of administrative records.

599. The department in charge of macroeconomic statistics does have a number of straightforward duties. It is the architect of the national economic accounts in the broad sense of the term (with the scope defined in *System of National Accounts 1993*.[125] It should be equally responsible for certain derived estimates, such as the index of industrial production (usually the estimate of the value added at constant prices of the sectors responsible for mining, manufacturing and part of public utilities) and the level and rate of change in productivity, where such calculations exist.

[125] Commission of European Communities, and others (United Nations publication, Sales No. E.94.XVII.4).

600. Since there are many instances in which the statistical agency is not responsible for the compilation of the national accounts, the consequences of dividing the responsibility for macroeconomic statistics should be mentioned. The producer of basic statistics is often less concerned with estimates of GDP than with loss of quality in economic statistics. Accordingly, coordinators in systems where responsibilities are split should be especially mindful of the importance of ongoing critical evaluation from the perspective of those who compile the national accounts.

601. Whether or not the macroeconomic accounts department should also be responsible for such statistics as the flow of funds table or the national balance of payments depends on the capacity of the central statistical agency to access and interpret financial transactions. As this capacity varies a great deal, in many cases the responsibility for the balance of payments, or at least for the capital account of the balance, remains with the central bank.

602. In general, a statistical system has much to gain from close contact between producers of basic statistics and compilers of the macroeconomic accounts. Such contact should move in both directions. The system benefits if there is prompt submission of basic results and a critical review and assessment of the quality of those results once they have been incorporated into the national accounting tables.

603. Figure A.6 in annex III assumes that the responsibility for **all** the macroeconomic accounts lies in one department.

604. The last two decades have witnessed increased interest in a number of non-traditional statistics, the most significant of which are those related to the environment and natural resources, the diffusion of scientific knowledge, and the acquisition and use of new technologies. In addition, the dependence of many offices on tax and pension-related administrative records has increased substantially. Tax and social security-related statistics developed as a by-product of new statistics on consumer behaviour, which resulted from linked survey and administrative records. In the near future, as Internet use for business and consumer-related matters as well as for research, education and other areas becomes universal, it is likely that the realm of statistics will expand even further.

605. None of these statistics fits perfectly with the traditional split between economic and social subjects. Some fall into both categories. Others - particularly those related to science and the natural environment - represent a new field of inquiry. Whether or not they require their own departments (particularly in smaller offices) cannot yet be determined. In addition, these statistics are still in a phase of development; there are few internationally agreed-upon standards for collection and compilation, and in many instances the chief responsibility is still in the hands of other ministries, and not necessarily in the statistical branches within those ministries.

606. One possible solution is to house new statistical developments in the research department of the statistical agency, if such a department exists. Another is to create a research facility within the national accounting department. Clearly, the proper solution will vary from country to country.

5. Statistical infrastructure

607. The departments responsible for the statistical infrastructure have the following three main functions, which are reflected in the organization of the statistical agency:

- Developing scientific methods and their application in the measurement of variables characteristic of social and economic processes;

- Drafting codes that ensure both internal consistency in the way variables are defined and classified and a certain amount of intercountry comparability (compliance throughout the national statistical system is assumed);

- Creating and maintaining the databases required to sample businesses, households, and physical facilities.

608. In more ways than one, the department in charge of the development and application of scientific methods also acts as the professional conscience of the statistical system. As such, it should adhere to the strictest quality standards.

609. The department in charge of standards and classifications should possess sufficient authority to set legal standards against which there is limited appeal. In general, review of the correctness and soundness of a particular standard or method should take place prior to its implementation.

610. The department in charge of the statistical agency's sampling frames should maintain the records' physical and functional integrity and keep them up-to-date; provide frame extracts to those conducting sample surveys or censuses; and make sure all parts of the statistical agency use official sampling frames rather than unauthorized surrogates.

611. These responsibilities presuppose an agency-wide conviction that it is best to have a single comprehensive sampling frame for each major application (e.g., all business surveys) rather than separate frames for each survey, and that survey-taking departments should pool their knowledge, updating a collective frame rather than maintaining individual frames.

612. Commonly, mathematical statisticians are concentrated in the department in charge of sampling and sample survey design. In addition to its other responsibilities, the department should be able to substantiate the following principles:

- All surveys conducted by the statistical agency should be based on sound designs;

- The information necessary to gauge the reliability of the statistics produced by the agency must be intelligible and accessible to all users;

- All members of the statistical agency should be thoroughly convinced of the need to base their measurement activities on sound scientific principles as the only means to establish the quality of the statistics produced.

613. So long as these three principles are at the forefront of the statistical agency's agenda, less importance is placed on whether the department in charge of statistical methods should be physically distinct from all others, whether its staff should be dispersed among the user departments within the agency or whether to adopt alternative solutions. The design of the infrastructure will depend largely on country-specific circumstances.

614. In practice, one needs to strike a balance between the two concerns. On the one hand, mathematical statisticians can contribute most to a healthy statistical agency as part of multidisciplinary project teams, in which they defend quality, advise on scientific methods and work towards increased efficiency in the realization of projects. On the other hand, they must be part of an organization that supports the development of their technical skills and provides avenues for their career advancement. Achieving a balance can be challenging. Figure A.11 in annex III shows one possible way of organizing for this area.

6. Technical infrastructure

615. Developments in technology have greatly expanded the capabilities of a statistical agency in the following four areas:

(a) All staff members in many statistical offices now have access to powerful, relatively inexpensive computer equipment;

(b) User-friendly applications software has given staff members control over a number of key statistical functions ranging from questionnaire design to collection, editing, tabulating, mapping and publishing. Readily available off-the-shelf components have made in-house application programming easier, and component reuse within the organization has become more common;

(c) Computer networking has facilitated internal access to data and metadata through established tiered client/server environments;

(d) Information technology has made timely access to external sources of information feasible for staff members, thereby making it possible to conduct research, gather general information and perform other relevant tasks at all levels of an organization, rather than solely through top management.

As a result of these and related changes, new concerns have emerged regarding the management of the information technology environment.

616. In the light of these developments, the department in charge of the technical infrastructure should perform the following functions:

- Manage the information technology model of the organization as described in chapter VII, section A;

- Administer the technical infrastructure of the agency;

- Determine the extent to which outsourcing is to be used and manage the relationship with vendors;

- Plan the replacement of capital equipment;

- Provide advice concerning ways to use information technology to advance the mission of the statistical agency.

7. The analytical function

617. The analytical function must be truly pervasive, occurring in all areas of a statistical agency. However, an agency bears a heavy operational burden, so its staff cannot engage in pure analysis all the time. Certainly, an analytical approach to problems is a necessity and should be omnipresent, but in this context analysis has a different connotation.

618. There are two major types of analytical activities to consider. One, which can be categorized as research, seeks to improve the efficiency of operations; to refine the concepts underlying measurement activities; and to innovate with methods that minimize error. The other analytical activity seeks to make sense of the results obtained; to place them in meaningful social or economic contexts; to relate them to other events and processes; and generally to make them more valuable to users. Naturally, feedback on any inadequacy or ambiguity of numerical results is a by-product of this analytical activity.

619. The comments in this section primarily pertains to the second set of analytical activities. In terms of organization, the agency should decide whether this activity takes place in all subject-matter departments or whether it should be concentrated in one department or area that will serve the entire agency. However, an effective agency generally incorporates elements of both approaches.

620. A possible boundary could be conceived along the following lines: explanatory material accompanying the release of new results (particularly those of ongoing surveys or more complex statistical activities) should be handled by the subject-matter department; analytical material designed to stand on its own (e.g., a study of demand for health facilities in light of the latest demographic projections, or the relation between survival rates of small firms and their propensity to innovate through new production processes) should be handled by a dedicated department capable of economic, sociological and demographic analysis.

621. One possible location for the unit in charge of analysis is in a subject area such as macroeconomic statistics or social statistics, depending upon the analytical emphasis in the agency. Another alternative is to place this function in the office of the chief statistician.

8. Planning

622. Planning is essential to a successful statistical agency. A sound plan proposes a series of objectives and offers reasonable arguments on how they are to be met and why the resources allocated are indeed adequate.

623. The planning function deals with establishing a process that produces a plan, defines the conditions of its implementation, monitors its execution, and advises on fallbacks and alternatives when necessary.

624. There are two ways to organize the planning function. One technique is to appoint a planning officer or dedicate a planning office to conduct this exercise annually and to be responsible for maintaining the plan. The other is to engage the management of the statistical agency to cooperate in a collective effort and produce a balanced plan. Clearly, an effort involving all parts of an agency will receive more acceptance, support and commitment than a specialized effort.

625. The time frame is an especially important element in planning. Developmental statistical activities should not be limited to a single-year plan; nonetheless, planning should be realistic and not look too far into the future. The longer the time frame, the less reliable are the planning assumptions necessary to ensure a proper allocation of resources. A possible balance between the two considerations is to plan according to a three-year time frame.

9. Horizontal and vertical mechanisms

626. A detailed description of horizontal mechanisms is included in chapter V. There are a few differences between vertical hierarchies and committee structures. The vertical (or line) structure of a statistical agency broadly follows the hierarchy of public administration; it is in many instances ordained in the agency's legislation; and it often corresponds to the financial allocations made by the Government to the statistical agency. As such it cannot be easily altered, although total inflexibility should be avoided.

627. The horizontal structure of a statistical agency (i.e., its ad hoc committee structure) exists to solve management, subject-matter and procedural problems inherent in the official structure of the agency. Owing to the nature of the problems, their effectiveness in resolving conflicts and the respect they gain as a source of dispassionate advice, these committees provide a sense of cohesion that the vertical structure at times unwittingly undermines. Playing these two roles requires the committee structure of a statistical agency to be highly flexible so that it can take full advantage of the personal attributes of its staff in responding quickly to problems as they arise.

C. Building external support

628. No statistical agency can function effectively without the systematic help of outside contacts. The more prestigious these contacts, the more they will bolster the credibility of the office.

629. A statistical agency can be challenged by members of its various constituencies on several fronts. Users may demand explanations of how priorities are determined; assurances regarding the quality of results (i.e., use of objective methods and the absence of political tampering); and guarantees of the confidentiality of individual records.

630. These questions can be difficult to answer, particularly those regarding quality and priority ranking. The agency's position is immensely strengthened if it can demonstrate that a well-chosen, knowledgeable group of outsiders reviewed its decisions and either agreed or suggested modifications that were taken into account in the final determination. Likewise, the agency position on the objectivity and the timeliness of chosen methods can be strengthened if it can point to their review and approval by the best technical experts available.

631. For these reasons, while a senior council or commission is typically charged with a periodic review of statistical policies and priorities, a number of agencies have built a network of supplementary advisory bodies. Their reports are made available to the public and the government authorities responsible for the agency.

632. Supportive measures will allow the statistical agency to face all the challenges that arise out of the exercise of its mandate. Whatever mechanisms are put in place, the following are crucial:

- A proper legal basis;
- Distinguished and interested outsiders (national and international) who serve as members of a network of commissions and committees, both formally and informally;
- Public status commensurate with the responsibilities of being chief fact-finder for the Government and for the nation.

633. In the end, the agency should demonstrate that it has managed its resources wisely, kept the Government and the public informed, served the international statistical community and communicated important information impartially and effectively.

ANNEX I. Annotated model of a National Statistics Act

Introduction

Chapter II, Section E of the present edition of the *Handbook of Statistical Organization* covers some general principles of statistical legislation, but contains few specifics. Annex I presents specific texts that might be useful for countries that want to introduce a general statistics law or modify an existing one. It should be stressed that this "model statistics act" is not in any way meant to be prescriptive or normative. It is just an illustration of the issues that are addressed in actual statistical legislation in various countries; several of the texts are derived from actual statistical laws.

The model, prepared for the fictitious country of "Numberland", contains two types of elements:

1. Issues that are about matters of principle and that should be dealt with in all statistics acts (printed in **bold** typeface). In this regard, reference is also made to the Fundamental Principles of Official Statistics, adopted by the Statistical Commission of the United Nations in 1994. These issues often relate directly to what is said in the Principles, as will be explained in annotations to the text.

2. Alternative or optional elements. The heading "Alternatives" indicates solutions that are different, but not necessarily inferior to the ones described in the issues mentioned before. "Optional" elements are more country-specific; they may work for some countries, but may be unacceptable for others.

Statistics Act of Numberland

Note: The Act consists of three main sections: general (see chapter II, section E.1), which concerns the main actors of the statistical system and their roles, responsibilities and interactions; statistical operations and data collection, including some provisions for regionally decentralized systems (see chapter II, section E.6); and data confidentiality, including access to information protected by other laws (see chapter II, section E.4).

A. General

1. Definitions[a]

In this Act:

(a) *Chief statistician* means the Chief Statistician of Numberland;

(b) *Department* means any department, board, bureau, agency or other division of the government of Numberland or of the Government of a region or any agency of either;

(c) *Minister* means a member of the Cabinet of Ministers of Numberland;

(d) *Respondent* means a natural or legal person in respect of whom or in respect of whose activities any report or information is sought or provided pursuant to this Act;

(e) *Council* means the National Statistical Council of Numberland.

2. Appointment of the Chief Statistician

The President of Numberland, at the recommendation of the Council of Ministers, shall appoint an officer whose title will be "Chief Statistician of Numberland" to hold office for a renewable, fixed term of five years.

Note: Appointment of the Chief Statistician for a fixed term helps to guarantee his professional independence and to prevent political interference with official statistics (see also above, chapter II, section C.4).

Alternative One

The Prime Minister of Numberland shall appoint an officer called the "*Chief Statistician*".

Alternative Two

The Parliament of Numberland shall appoint an officer called the "*Chief Statistician*".

[a] See also chapter II, Sect. E.1 of the present *Handbook.*

Alternative Three

At the recommendation of the National Statistical Council, the President of Numberland shall appoint an officer called the "*Chief Statistician*".

Option

The President of Numberland shall appoint a Minister for Statistics, who shall act as the *Chief Statistician*.

3.Role of the Chief Statistician

The Chief Statistician shall:

(a) Advise on matters pertaining to statistical programmes of the departments of the Government of Numberland, and confer with those departments to that end;

(b) Decide on the manner in which data for statistical purposes are collected, how they are compiled and when and how statistics are published;

(c) Supervise generally the administration of this Act and control the operations and staff of Statistics Numberland;

(d) Represent Numberland in international statistical meetings or designate one or more staff members of Statistics Numberland to do so.

Note: The provisions in this article support the coordinating role of the Chief Statistician (subparagraph [a]); his professional autonomy (subparagraph [b]); see also annex II, "Fundamental Principles of Official Statistics" and his/her international role (see annex II, articles 9 and 10 of the Fundamental Principles of Official Statistics).

4. Statistics Numberland

There shall be a statistics bureau, to be known as Statistics Numberland, the duties of which are:

(a) To collect, compile, analyse and publish statistical information relating to the commercial, industrial, financial, social, economic, environmental and general activities and condition of the people;

(b) To collaborate with departments of Government in the collection, compilation and publication of statistical information, including statistics derived from the activities of those departments;

(c) To promote the avoidance of duplication in the information collected by departments of government;

(d) Generally, to promote and develop integrated social and economic statistics pertaining to the whole of Numberland and to each of the regions thereof, and to coordinate plans for the integration of those statistics.

5. Work plan, release calendar and annual report

(a) Three months before the beginning of each new fiscal year, the Chief Statistician shall submit to the Council of Ministers[b] a work plan for the next fiscal year, setting out all major statistical collections and planned publications, as well as estimates of expenditure and revenues related to this;

(b) At the beginning of each new fiscal year, the Chief Statistician shall publish a calendar of the most important releases of new statistics in that fiscal year;

(c) Within three months after the end of each fiscal year, the Chief Statistician shall present a report to the Council of Ministers[b] with regard to the activities of Statistics Numberland in the preceding fiscal year.

Note: This article is mainly about transparency and accountability, two important aspects of the Fundamental Principles. The publication of the advance release calendar (subparagraph [b] above) prevents political interference with statistical outcomes.

6. National Statistical Council

(a) There shall be a National Statistical Council whose role is:

(i) To advise the Chief Statistician on statistical work plans; its advice shall be added when the work plan is submitted to the Council of Ministers;

(ii) To comment on the annual report that the Chief Statistician submits to the Council of Ministers; its comments shall be added to this report;

(iii) To advise the Chief Statistician on any other statistical issues.

[b] Or, as in the case may be, to the President, the Parliament or the Minister designated to be politically responsible for statistics.

(b) The Council shall be chaired by the Chief Statistician;

(c) The Council shall meet at least four times a year;

(d) The Council may set up subcommittees and ad hoc advisory groups;

(e) The Council shall have at least 15 members, representing the most important user groups of official statistics, in particular government departments, the business community and academia;

(f) Members of the Council shall be appointed by the Minister,[c] at the recommendation of the Chief Statistician. They will serve for renewable terms of four years;

(g) The Council's rules of procedure shall be approved by the Minister.

Note: The principal role of a National Statistical Council is to interface with the users of statistics and thereby enhance the relevance of official statistics (see annex II, "Fundamental Principles of Official Statistics", article 1). As there are many different ways to set up such a council, some alternatives to the above are listed below.

Alternatives

(a) The Minister chairs the Council, the Chief Statistician is vice-chair;

(b) There is an independent chairman; the Chief Statistician is an ex officio member;

(c) The Council has fewer or more members;

(d) The Council approves the statistical work plan (as opposed to just advising on it);

(e) Recommendation for membership through co-optation (Council itself proposes candidates);

(f) Membership is specified by law (e.g., "a representative of the Ministry of Finance, a representative of the Central Bank, a representative of the Council of Economic Advisers," etc.);

(g) Longer or shorter terms of service.

[c] The Minister politically responsible for statistics.

B. Statistical Operations and Data Collection

Note: This part of the law is mainly about practical arrangements for data collection, including access to government data sources that may be relevant for statistical purposes. Statistics should be collected in the most efficient way, and respondents should not be unduly burdened (see also annex II, "Fundamental Principles of Official Statistics").

1. Statistical personnel

The Chief Statistician may employ such commissioners, enumerators, agents or other persons as are necessary to collect for Statistics Numberland such statistics and information as the Chief Statistician deems useful and in the public interest relating to such commercial, industrial, financial, social, economic and other activities as the Chief Statistician may determine; and the duties of the commissioners, enumerators, agents or other persons shall be those duties prescribed by the Chief Statistician.

Options

Public servants

The Minister may, for such periods as it may determine, use the services of any employee of the public service of Numberland in the exercise or performance of any duty, power or function of Statistics Numberland under this Act or any other Act, and any person whose services are so used shall, for the purposes of this Act, be deemed to be a person employed under this Act.

Note: This implies that the Minister who is politically responsible for official statistics has the power to recruit civil servants outside Statistics Numberland to perform statistical duties; among other things, this may be important for censuses.

Contracted services

Any persons retained under contract to perform special services for the Chief Statistician pursuant to this Act; and the employees and agents of those persons shall, for the purposes of this Act, be deemed to be persons employed under this Act while performing those services.

Cooperation with regional authorities

The Chief Statistician may enter into arrangements with the Government of a region providing for matters necessary or convenient for the purpose of carrying out or giving effect to this Act, and in particular for all or any of the following matters:

(a) The execution by regional officers of any power or duty conferred or imposed on any officer pursuant to this Act;

(b) The collection by any regional department or regional officer of statistical or other information required for the purpose of this Act;

(c) The supplying of statistical information to the Chief Statistician by any regional department or regional officer.

All regional officers executing any power or duty conferred or imposed on any officer pursuant to this Act, in pursuance of any arrangement entered into under this section, shall, for the purposes of the execution of that power or duty, be deemed to be employed under this Act.

The Chief Statistician may enter into an agreement with the Government of a region for the exchange with or transmission to a statistical agency of the region of:

(a) replies to any specific statistical inquiries;

(b) replies to any specific classes of information collected under this Act;

(c) any tabulations and analyses based on replies referred to in (a) or (b).

An agreement with a region for the purposes of this section shall apply only in respect of a statistical agency of the region:

(a) that has statutory authority to collect the information that is intended to be exchanged or transmitted, pursuant to the agreement from a respondent who is subject to statutory penalties for refusing or neglecting to furnish information to the agency or for falsifying information furnished by him to the agency;

(b) that is prohibited by law from disclosing any information of a kind that Statistics Numberland, its officers and employees would be prohibited from disclosing, if the information were furnished to Statistics Numberland;

(c) whose officers and employees are subject to statutory penalties for disclosing any information of the kind described in subparagraph (b).

When any such information is collected by Statistics Numberland from a respondent, Statistics Numberland shall, when collecting information, advise the respondent of the names of any statistical agencies in respect of which the Chief Statistician has such an agreement.

Note: There are many different modes of interaction and cooperation between the national statistical agency and regional bodies. In some countries the national statistical agency has regional offices that are fully under its control (often called the "vertical

system"), while in others the regional statistical offices are part of the regional Government (the "horizontal system"). Mixtures of these two systems also exist. Still other types of relationships between regional and central Governments occur in federally structured countries.

2. Sharing of information

The Chief Statistician may enter into an agreement with any department or municipal or other corporation for the sharing of information collected from a respondent.

Such an agreement shall provide:

(a) That the respondent shall be informed by notice that the information is being collected on behalf of Statistics Numberland and the department or corporation, as the case may be;

(b) That where the respondent gives notice in writing to the Chief Statistician that the respondent objects to the sharing of the information by Statistics Numberland, the information shall not be shared with the department or corporation unless the department or corporation is authorized by law to require the respondent to provide that information.

Note: See also article 6 of the "Fundamental Principles of Official Statistics" in annex II.

Option

Access to records

A person having the custody or charge of any documents or records that are maintained in any department or in any municipal office, corporation, business or organization, from which information sought in respect of the objects of this Act can be obtained or that would aid in the completion or correction of that information, shall grant access thereto for those purposes to a person authorized by the Chief Statistician to obtain that information or aid in the completion or correction of that information.

3. False or unlawful information

Every person who, without lawful excuse:

(a) Refuses or neglects to answer, or willfully answers falsely, any question requisite for obtaining any information sought in respect of the objects of this Act or pertinent thereto that has been asked of him by any person employed or deemed to be employed under this Act; or

(b) Refuses or neglects to furnish any information or to fill in to the best of his knowledge and belief any schedule or form that the person has been required to fill in, and to return the same when and as required of him pursuant to this Act, or knowingly gives false or misleading information or practices any other deception there under is, for every refusal or neglect, or false answer or deception, guilty of an offence and liable on summary conviction to a fine not exceeding ..... or to imprisonment for a term not exceeding .....or to both.

4. Refusal to grant access to records

Every person:

(a) Who, having the custody or charge of any documents or records that are maintained in any department or in any municipal office, corporation, business or organization, from which information sought in respect of the objects of this Act can be obtained or that would aid in the completion or correction of the information, refuses or neglects to grant access to the information to any person authorized for the purpose by the Chief Statistician; or

(b) Who otherwise in any way willfully obstructs or seeks to obstruct any person employed in the execution of any duty under this Act

is guilty of an offence and liable on summary conviction to a fine not exceeding .....or to imprisonment for a term not exceeding .....or to both.

Note: Although enforcement by law may not be the ideal way to obtain basic data for statistics (see chapter II, section E.3), most statistics acts contain some provisions to make data collection for statistics statutory.

Options

Coding system for goods

The chief statistician shall establish a coding system for goods imported into and exported from Numberland to enable the collection, compilation, analysis and publication of statistics in relation to those goods.

Forms for statistical data

Instead of, or in addition to, using agents or employees for the collection of statistics under this Act, the Chief Statistician may prescribe that a form be sent to a person from whom information authorized to be obtained under this Act is sought. A person to whom such a form is sent shall answer the inquiries thereon and return the form and answers to Statistics Numberland properly certified as accurate, not later than the time prescribed therefore and indicated on the form or not later than such extended time as may be allowed at the discretion of the Chief Statistician.

Returns under the Income Tax Act

For the purposes of this Act:

(i) the Chief Statistician, or any person authorized by the Chief Statistician to do so, may inspect and have access to any returns, certificates, statements, documents or other records obtained on behalf of the Minister of National Revenue for the purposes of the Income Tax Act;

(ii) the Minister of National Revenue shall cause the returns, certificates, statements, documents or other records to be made available to the Chief Statistician or person authorized by the Chief Statistician to inspect the records.

Return of exports and imports from Customs

For the purposes of this Act, the Minister of National Revenue shall cause to be sent to the Chief Statistician returns of imports and exports into and from Numberland and details of the means of transportation used therefore.

Additional options

Population census

(i) A census of population of Numberland shall be taken by Statistics Numberland in the month of .... in the year ....., and every tenth year thereafter;

(ii) The census of population shall be taken in such a manner as to ensure that counts of the population are provided for each district of Numberland, as constituted at the time of each census of population.

Agriculture Census

A census of agriculture of Numberland shall be taken by Statistics Numberland in the year ..... and in every tenth year thereafter.

Census questions

The President of Numberland shall, by order, prescribe the questions to be asked in any census taken by Statistics Numberland.

Note: In some countries regulations for censuses are part of the general statistics law; in others censuses are governed by separate legislation.

C. Data Confidentiality

Note: Clearly, confidentiality of individual data is one of the main concerns of the Fundamental Principles. In addition to a general provision in the Statistics Act (article 11 below), an oath of office for statistical personnel (article 12 below) is often part of statistical legislation as well.

1. Prohibition against divulging information

Except for the purpose of communicating information in accordance with any conditions of an agreement made under this Act, and except for the purposes of a prosecution under this Act but subject to this section:

(a) No person, other than a person employed or deemed to be employed and sworn in under this Act, shall be permitted to examine any identifiable individual return made for the purposes of this Act;

(b) No person, who has been sworn in under this Act shall disclose or knowingly cause to be disclosed, by any means, any information obtained under this Act in such a manner that it is possible from the disclosure to relate the particulars obtained from any individual return to any identifiable individual person, business or organization.

2. Oath of office

The Chief Statistician and every person employed or deemed to be employed pursuant to this Act shall, before entering on his duties, take and subscribe the following oath or solemn affirmation:

> **I, ..., do solemnly swear (or affirm) that I will faithfully and honestly fulfill my duties as an employee of Statistics Numberland in conformity with the requirements of the Statistics Act, and of all rules and instructions there under and that I will not without due authority in that behalf disclose or make known any matter or thing that comes to my knowledge by reason of my employment.**

Where a person retained under contract to perform special services for the Chief Statistician pursuant to this Act is a legal person, the chief executive officer thereof and such other officers, employees and agents thereof as are used to perform the special services shall, before entering on any of the duties required under the contract, take and subscribe to the following oath or solemn affirmation:

I, ..., do solemnly swear (or affirm) that I will faithfully and honestly fulfill my duties as an employee of (name legal person) in respect of my employment in carrying out .....[d] in conformity with the requirements of the Statistics Act, and of all rules and instructions there under and that I will not without due authority in that behalf disclose or make known any matter or thing that comes to my knowledge by reason of my employment as described herein.

Options

The Chief Statistician may, by order, authorize the following information to be disclosed:

(a) Information relating to a person or organization in respect of which disclosure is consented to in writing by the person or organization concerned;

(b) Information relating to a business in respect of which disclosure is consented to in writing by the owner for the time being of the business;

(c) Information available to the public under any statutory or other law;

(d) Information relating to any hospital, mental institution, library, educational institution, welfare institution, public utility [e] or other similar non-commercial institution except particulars arranged in such a manner that it is possible to relate the particulars to any individual patient, inmate or other person in the care of any such institution;

(e) Information in the form of an index or list of individual establishments, firms or businesses, showing any, some or all of the following in relation to them:

(i) Their names and addresses;

(ii) The telephone numbers at which they may be reached in relation to statistical matters;

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[d] Reference to the contract that rules the tasks to be executed.

[e] *Public utility* means any natural or legal person that owns, operates or manages an undertaking for the supply of petroleum products by pipeline; the transmission or distribution of gas, electricity, steel or water; the collection and disposal of garbage or sewage; the transmission, emission, reception or conveyance of information by any telecommunications system; or the provision of postal services.

(iii) The products they produce, manufacture, process, transport, store, purchase or sell, or the services they provide, in the course of their business; or

(iv) Whether they are within specific ranges of numbers of employees or persons engaged by them, or constituting their work force.

3. Information is privileged

Except for the purposes of a prosecution under this Act, any return made to Statistics Numberland pursuant to this Act and any copy of the return in the possession of the respondent is privileged and shall not be used as evidence in any proceedings whatever.

No person sworn under this Act shall by an order of any court, tribunal or other body be required in any proceedings whatever to give oral testimony or to produce any return, document or record with respect to any information obtained in the course of administering this Act.

4. Disclosing secret information

Every person who, after taking the oath under this Act:

(a) Willfully discloses or divulges directly or indirectly to any person not entitled under this Act to receive the same any information obtained by him in the course of his employment that might exert an influence on or affect the market value of any stocks, bonds or other security or any product or article; or

(b) Uses any information described above in sub-paragraph (a) for the purpose of speculating in any stocks, bonds or other security or any product or article;

is guilty of an offence and liable on summary conviction to a fine not exceeding ....., or to imprisonment for a term not exceeding ....., or to both.

Options

Personation of Statistics Numberland employee

Every person who:

(i) Impersonates an employee of Statistics Numberland for the purpose of obtaining information from any person; or

(ii) Represents himself as making an inquiry under the authority of this Act when the person is not an officer, employee or agent of Statistics Numberland,

is guilty of an offence and liable on summary conviction to a fine not exceeding ....., or to imprisonment for a term not exceeding six months, or to both.

Application of fines

All fines imposed pursuant to this Act belong to the Government of Numberland and shall be paid to the Receiver General.

ANNEX II. The Fundamental Principles of Official Statistics

At its special session held in New York from 11-14 April 1994, the Statistical Commission adopted the fundamental principles of official statistics, as set out in ECE decision C (47), but incorporating a revised preamble. An extract from the report [*] containing the preamble and principles, as adopted is given below.

FUNDAMENTAL PRINCIPLES OF OFFICIAL STATISTICS

The Statistical Commission,

Bearing in mind that official statistical information is an essential basis for development in the economic, demographic, social and environmental fields and for mutual knowledge and trade among the States and peoples of the world,

Bearing in mind that the essential trust of the public in official statistical information depends to a large extent on respect for the fundamental values and principles, which are the basis of any society, which seeks to understand itself and to respect the rights of its members,

Bearing in mind that the quality of official statistics, and thus the quality of the information available to the Government, the economy and the public depends largely on the cooperation of citizens, enterprises, and other respondents in providing appropriate and reliable data needed for necessary statistical compilations and on the cooperation between users and producers of statistics in order to meet users' needs,

Recalling the efforts of governmental and non-governmental organizations active in statistics to establish standards and concepts to allow comparisons among countries,

Recalling also the International Statistical Institute Declaration of Professional Ethics,

Having expressed the opinion that resolution C (47), adopted by the Economic Commission for Europe on 15 April 1992, is of universal significance,

Noting that, at its eighth session, held at Bangkok in November 1993, the Working Group of Statistical Experts, assigned by the Committee on Statistics of the Economic and Social Commission for Asia and the Pacific to examine the Fundamental

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[*] Official Records of the Economic and Social Council, 1994, Supplement No. 9 (E/1994/29), chap. V.

Principles, had agreed in principle to the ECE version and had emphasized that those principles were applicable to all nations,

Noting also that, at its eighth session, held at Addis Ababa in March 1994, the Joint Conference of African Planners, Statisticians and Demographers, considered that the Fundamental Principles of Official Statistics are of universal significance,

Adopts the present principles of official statistics:

1. Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.

2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

7. The laws, regulations and measures under which the statistical systems operate are to be made public.

8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

ANNEX III. Figures representing possible ways to organize the functions of a statistical office

Annex III presents a selection of twelve figures that illustrate the most important functions carried out by the average centralized statistical office. These figures are not organizational charts. The arrows represent information flows rather than hierarchical relations. The latter are thought to be too dependent on the circumstances of individual offices to be shown in a handbook such as this one.

A distinction is made among the various flows of information that connect one group of activities to another. In some cases the flow is of directives, policies, metadata and advice. Such flows are generally shown using narrow-tipped arrows on broad shafts. Broad-tipped arrows normally illustrate flows of data, raw or processed. Feedback flows are shown by very narrow black arrows. The text appended to the bottom of each figure should make clear what flows and from whom to whom. Although there are other flows, they are not represented in the figures in order to simplify the material.

The figures bring out three key themes of the present *Handbook*. First, all viable organizations are articulated information processing systems. Secondly, all viable organizations have feedback loops. Thirdly, all statistical organizations should have an analytical and research function. Nothing is said here about relative sizes or who is in control of what. Individual managers will determine how to implement the models illustrated in the figures so as to fit their circumstances.

Figure A.1. Outline of the functions of a statistical agency

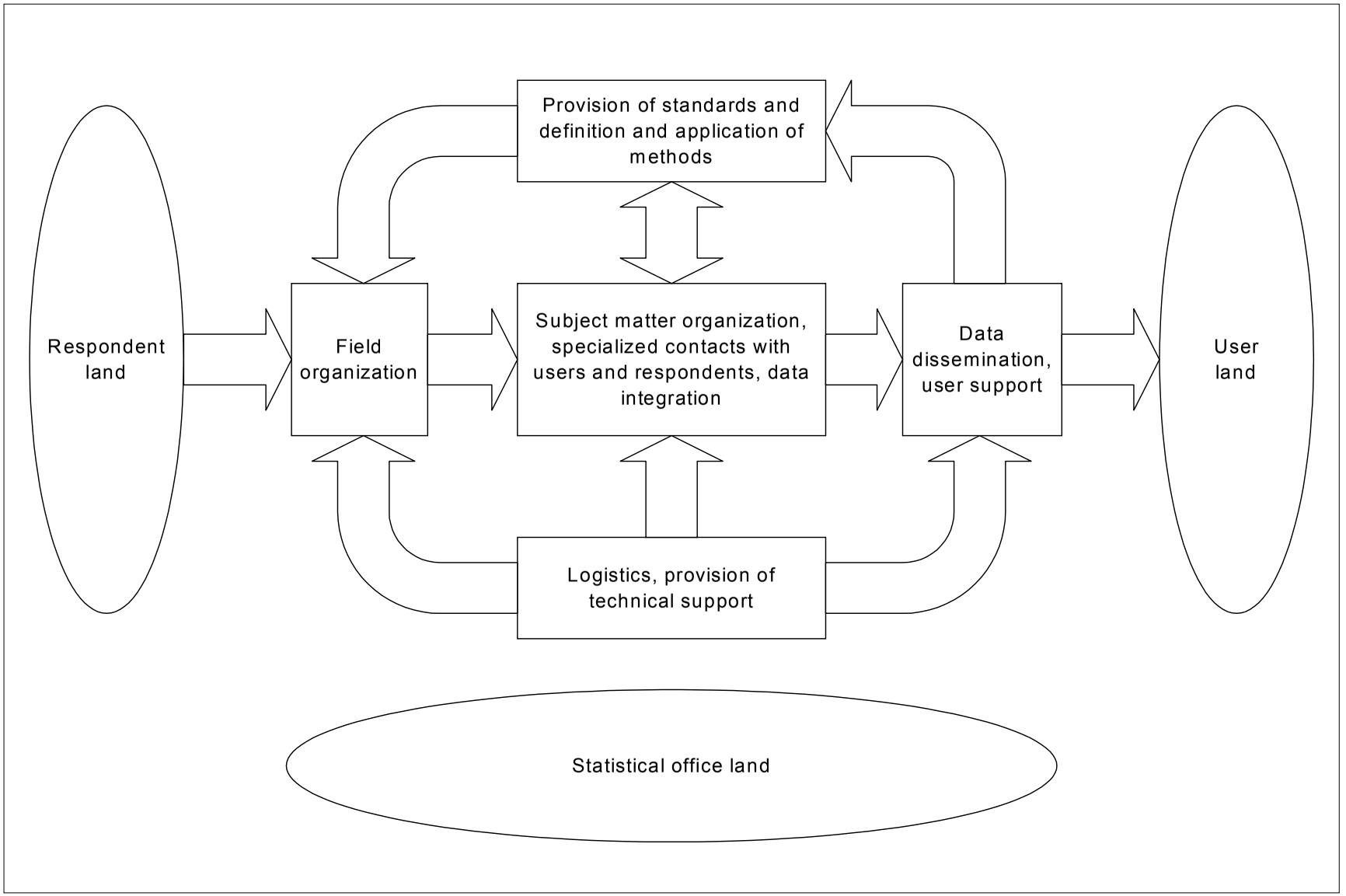
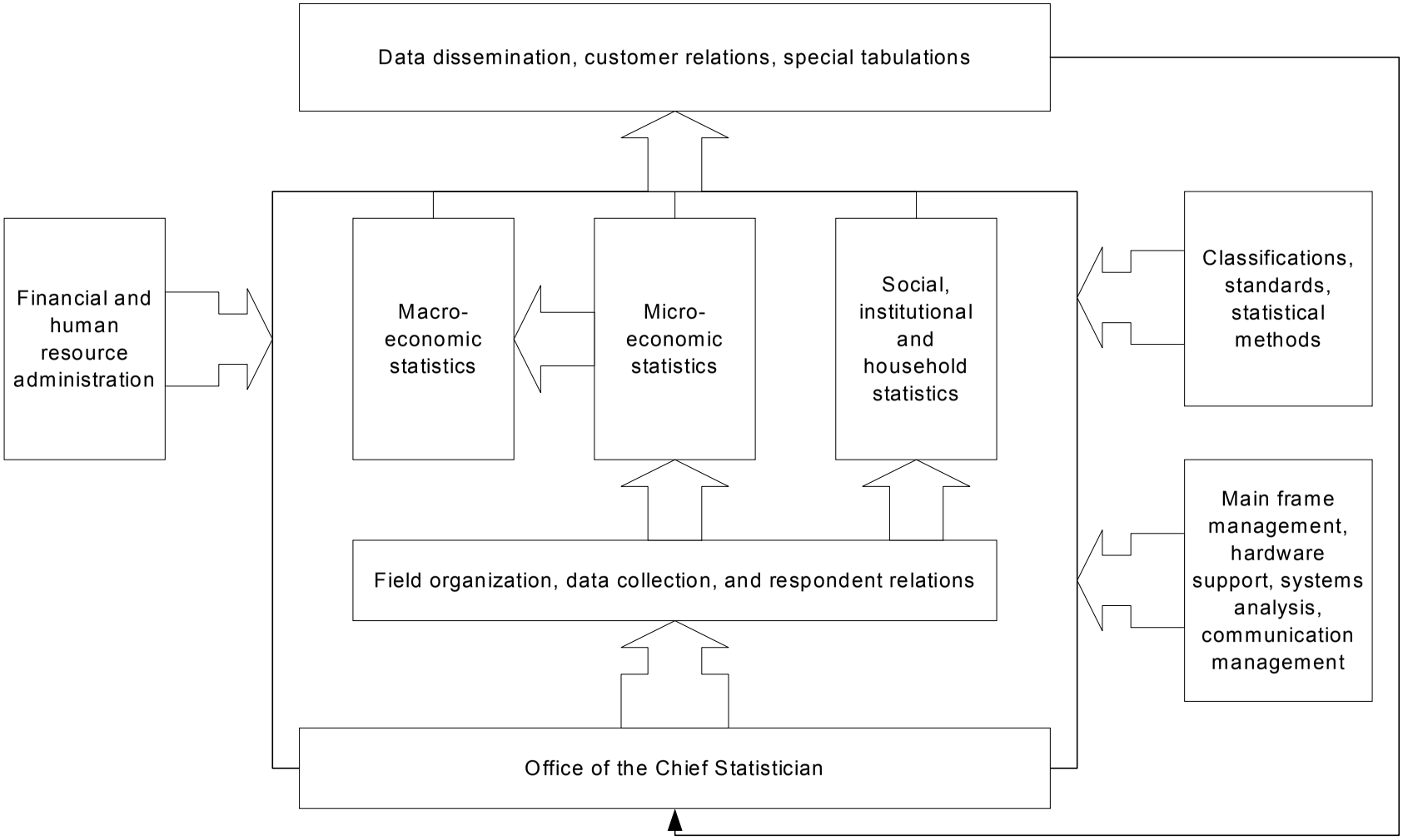
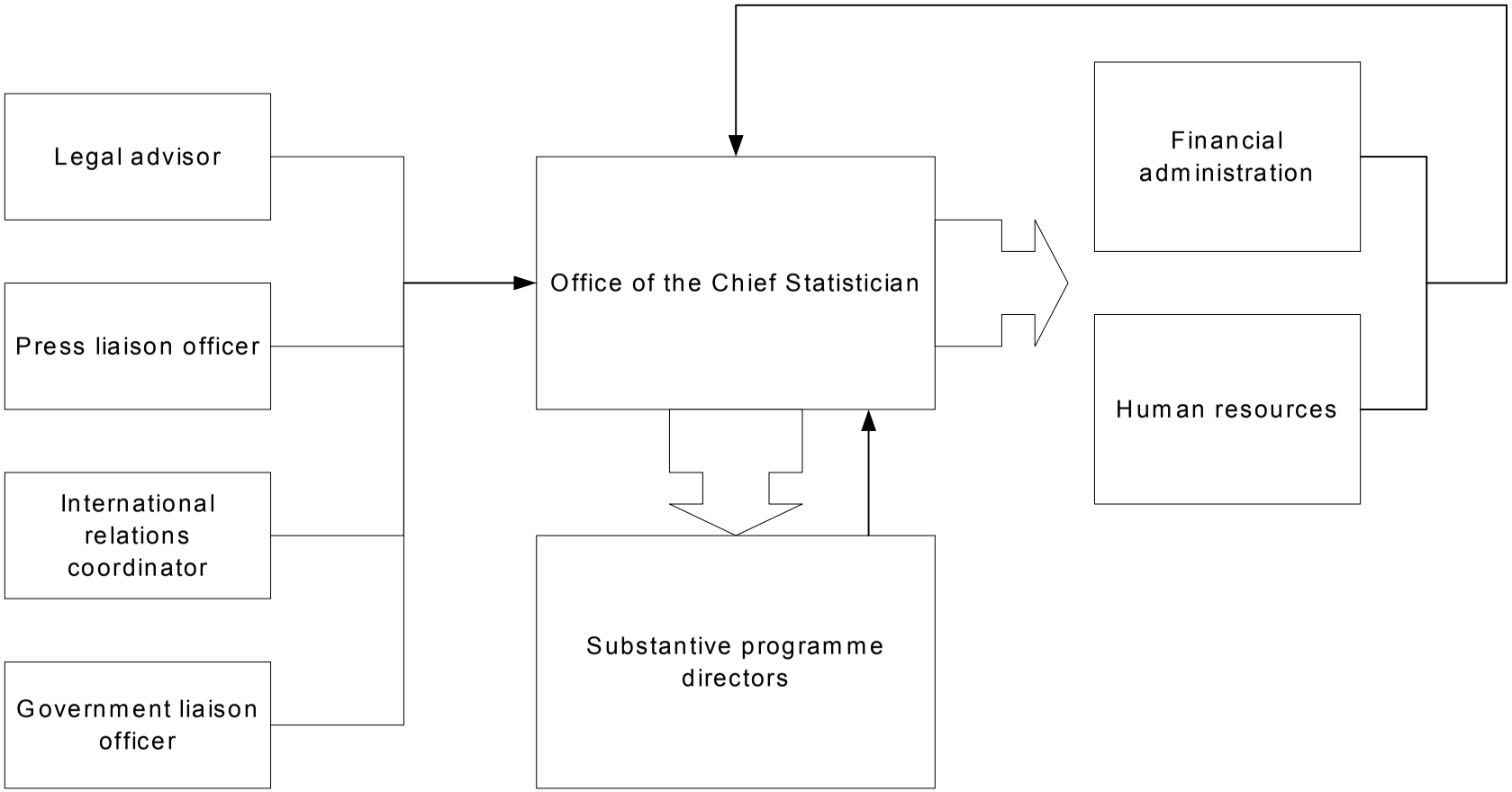


Figure A.2. Schematic structure of a statistical office: internal functions



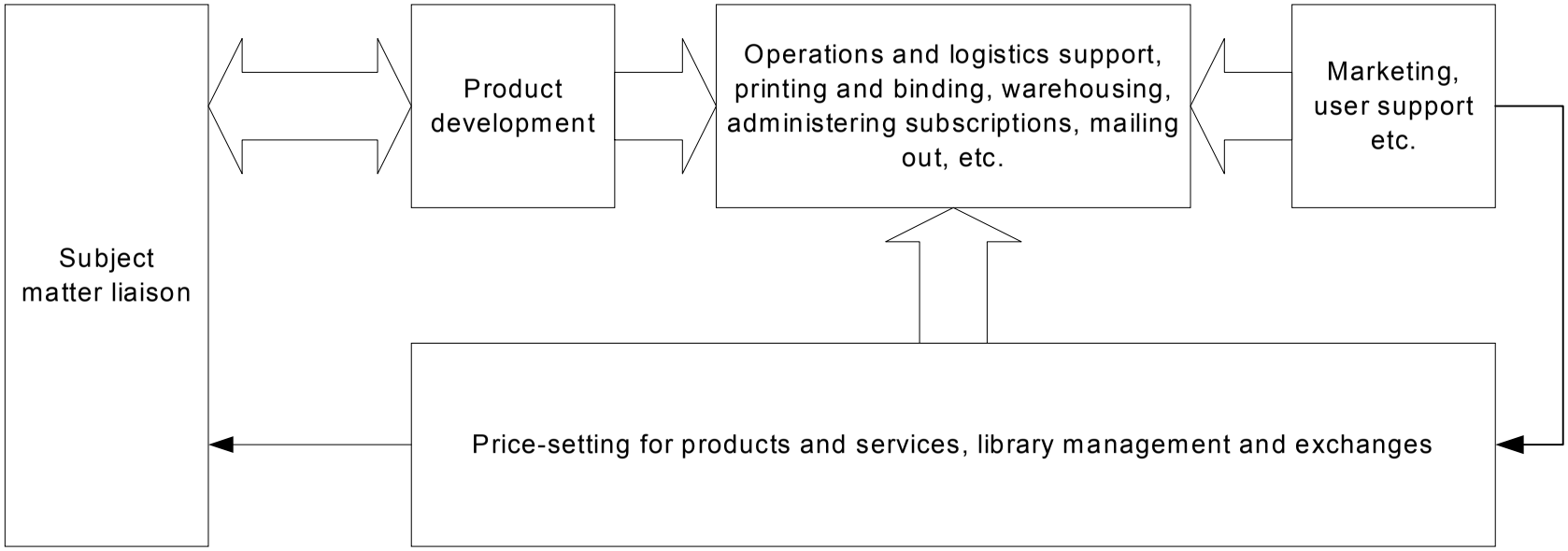
In this stylized diagram, the office of the Chief Statistician and the offices concerned with administration of financial and human resources provide policy directives and legal frameworks to the subject-matter areas. This is denoted by the arrows with a broad base. Within the subject-matter areas, the field organization provides raw data to the major subject departments, which in turn pass aggregated information to the area concerned with macro-economic estimates. All areas provide aggregated information to dissemination, represented by wide arrows. Dissemination and the subject areas are the main suppliers of feedback to the office of the Chief Statistician.

Figure A.3. Functions of the office of the Chief Statistician



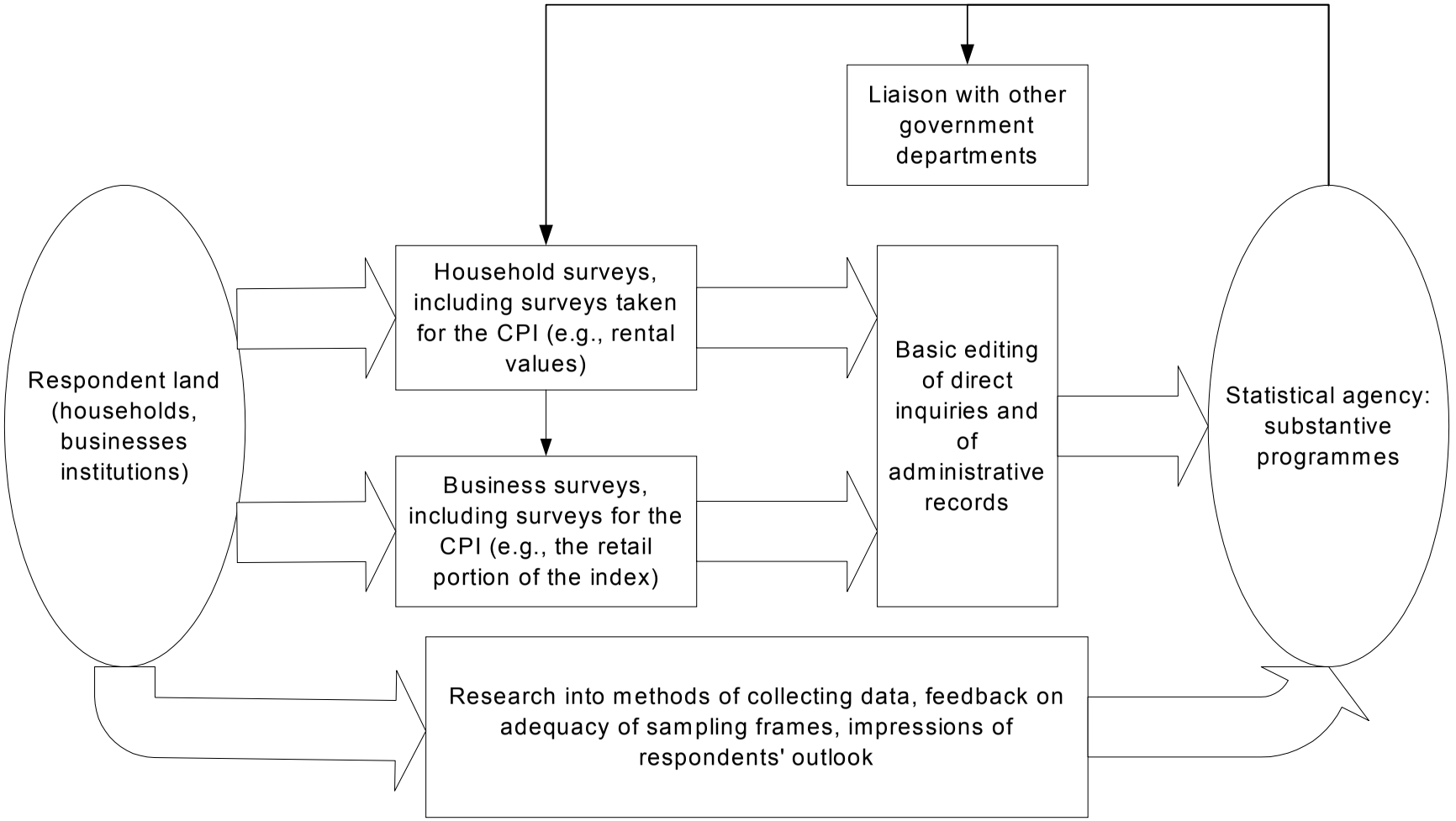
The office of the Chief Statistician receives advice and feedback (thin arrow) from all organizations in the office and is in close and direct contact with the legal advisor, the press liaison officer, the international relations coordinator and the Government liaison officer. The office issues policies and directives to all parties and the Chief Statistician administers the office through his/her advisors on financial and human resources management.

Figure A.4. Functions of a department charged with dissemination and user contacts



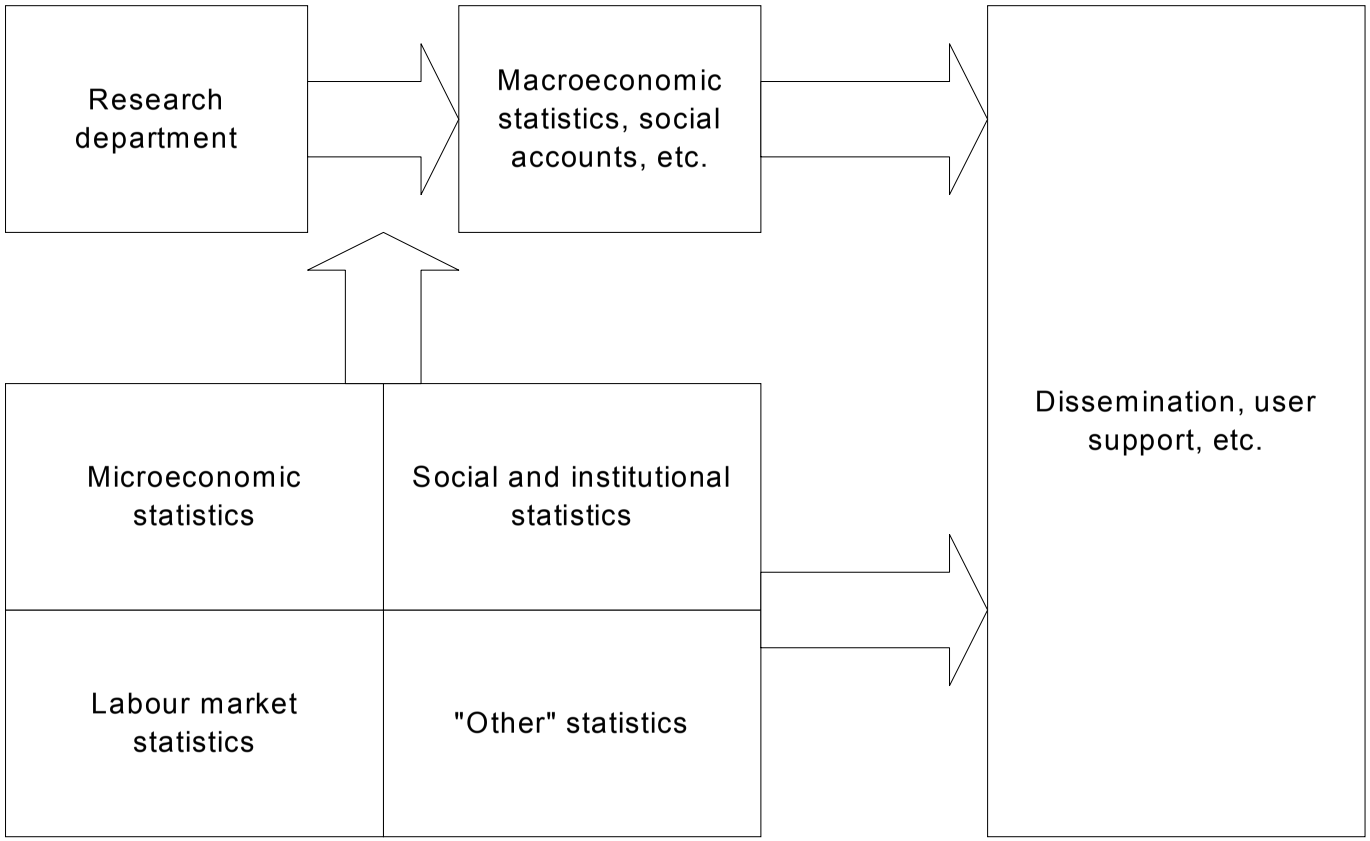
There is an iterative relationship between product development and subject matter, partly described by a double-headed arrow. Price-setting gets feedback (thin black arrow) from the distribution of publications. For the rest it is a matter of directives: operations and logistics are told by their clients what to do and how they should do it.

Figure A.5. Functions of a field organization, including the ability to collect administrative records



Respondents provide the field organization with raw data, which are edited before being handed over to programme areas. Research is conducted into methods and the prevailing mood of respondents and communicated to programme areas for changes in survey frameworks and details.

Figure A.6. Functions and subjects in the programme area of a statistical office



Side-by-side with the department in charge of macroeconomic (and social) accounts is a research arm that helps in assessing basic statistics. The latter are divided into four major groups largely as a function of the source of the raw data. Feedback is derived from contacts with users and, as far as the departments in charge of basic statistics are concerned, from the macroeconomic accounts.

Figure A.7. Possible breakdown by subject of programme area concerned with economic statistics

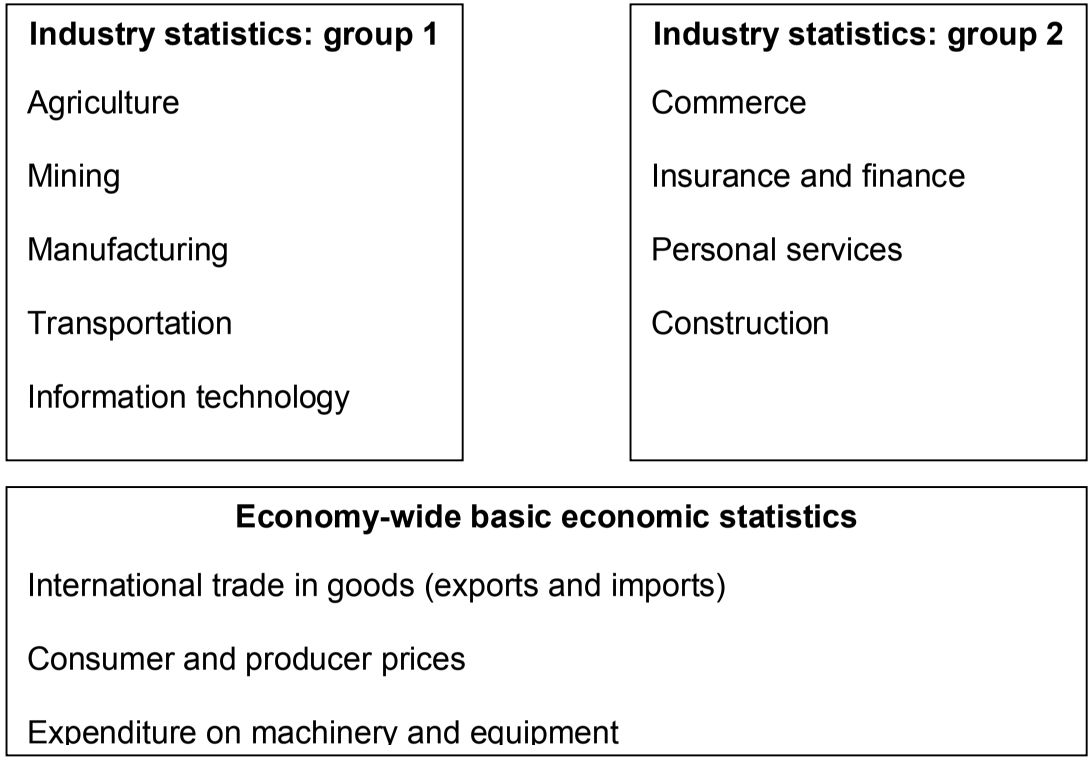
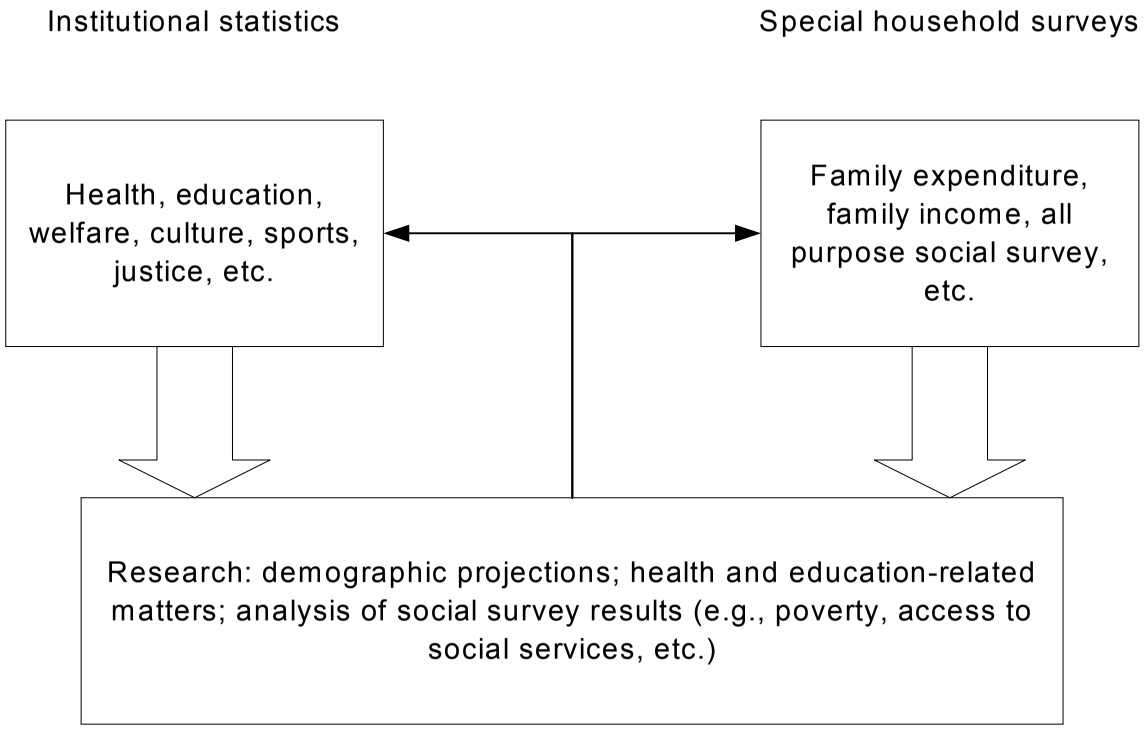


Figure A.8. List of subjects in a department concerned with household and institutional statistics



In the absence of an integrating framework comparable to the national accounts, this area requires a research capability that accesses the basic statistics collected by the two departments and provides them with feedback derived from its analyses.

Figure A.9. Possible analytical structure for the department concerned with the labour market

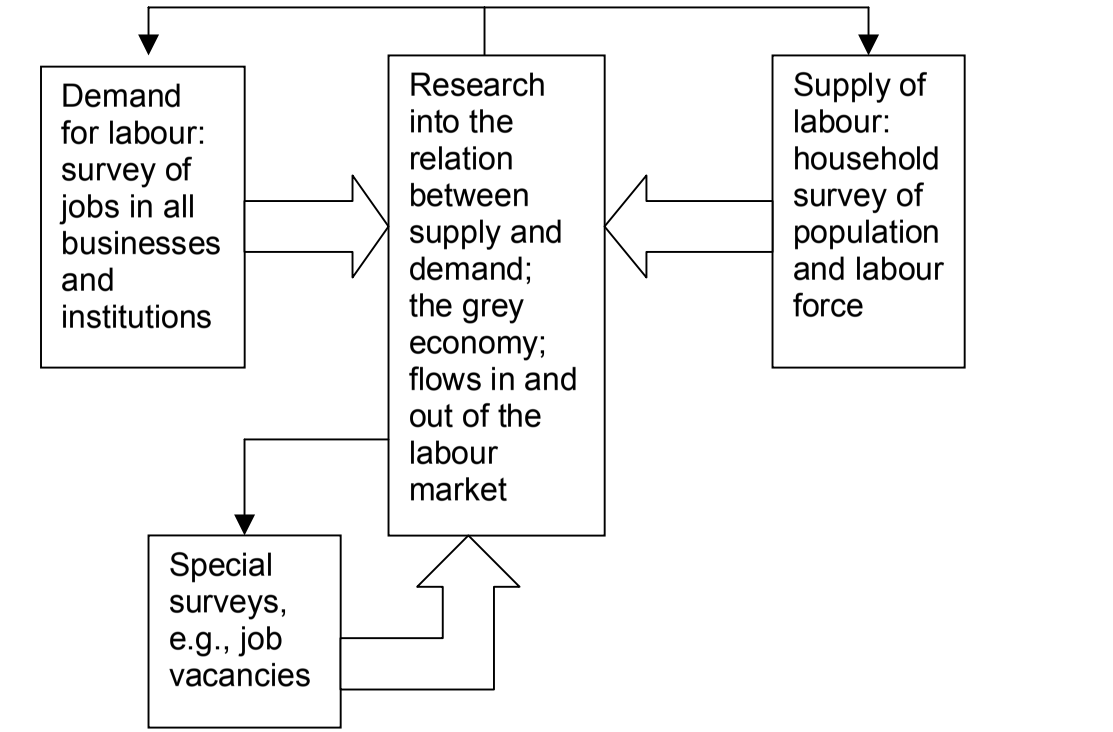
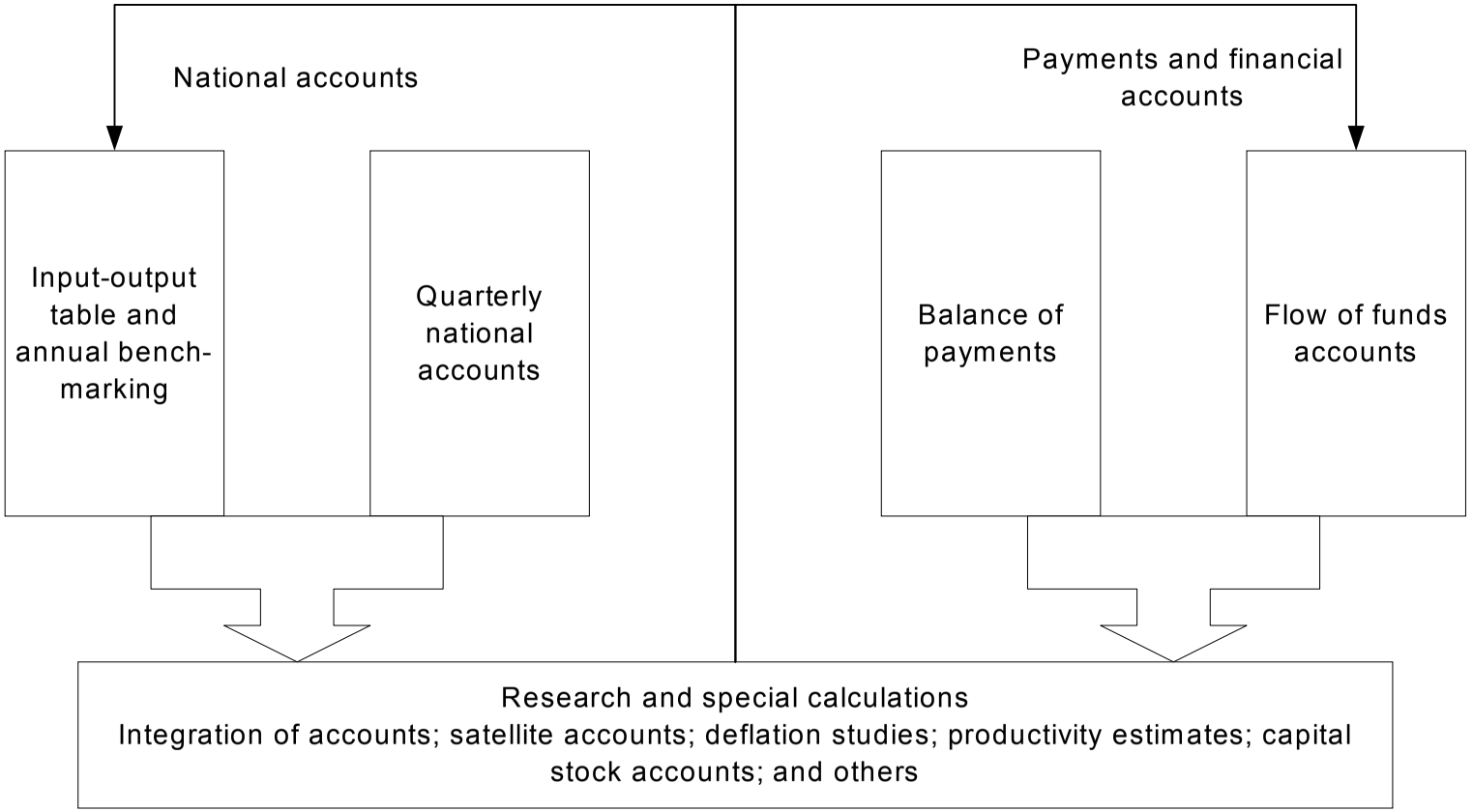
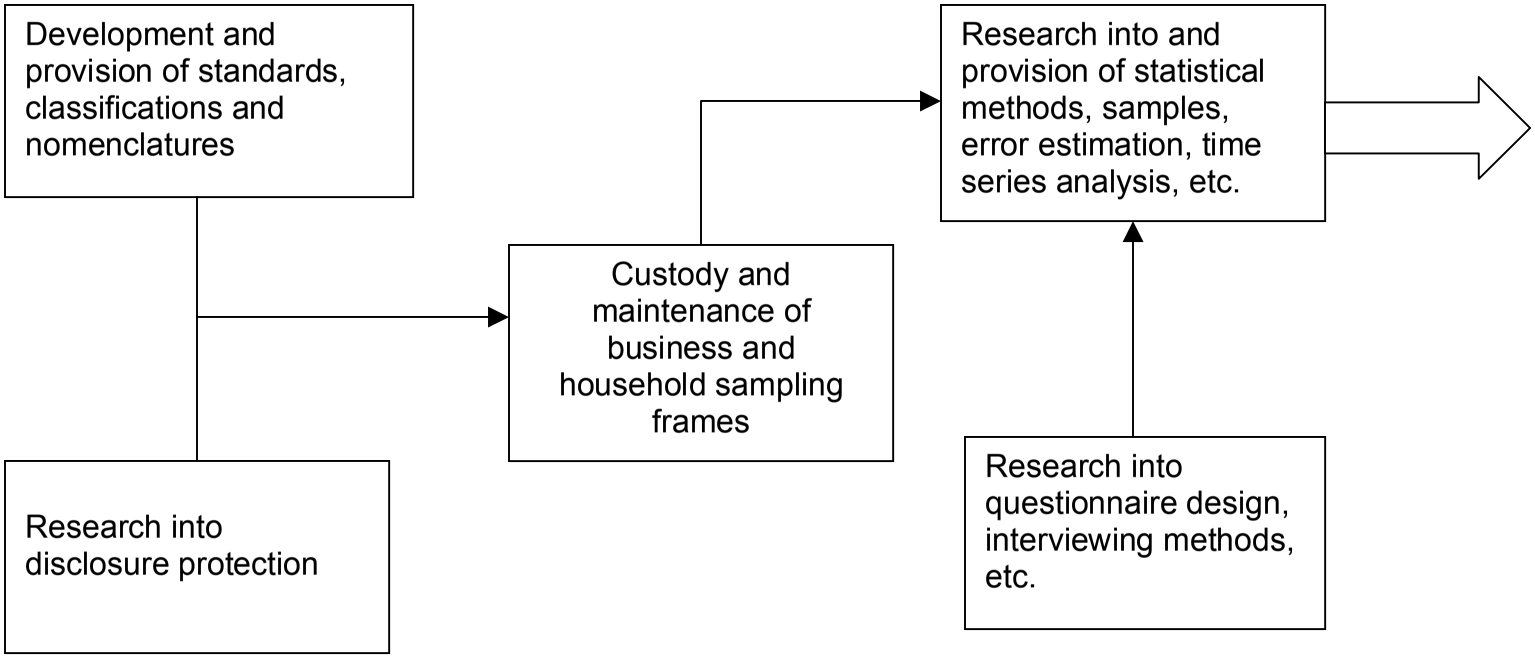


Figure A.10. Possible structure for a department in charge of macroeconomics statistics



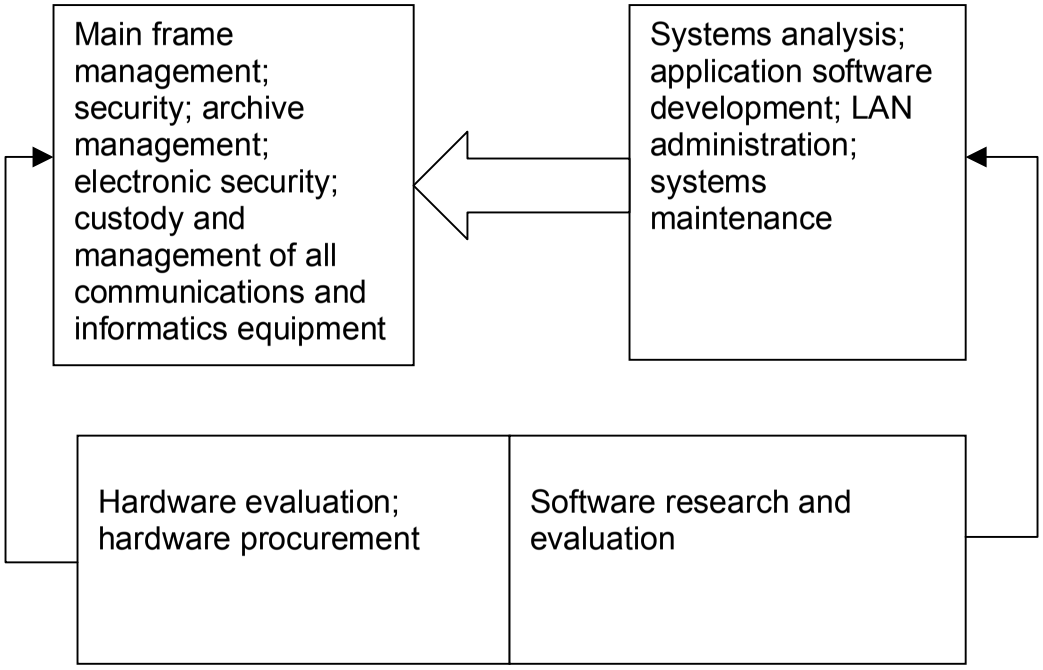
The research department is primarily in charge of integration and is ideally placed to provide the four participating areas with the results of its efforts to integrate financial and "real" data.

Figure A.11. Possible structure of the department responsible for the statistical infrastructure



The provision of information required to conduct a successful sample survey is derived from all the activities listed in this diagram.

Figure A.12. Possible functions for a department concerned with the technical infrastructure of a statistical agency



Software development feeds hardware management and evaluation of hardware, and software tracks technological innovation and governs procurement.