

## Article

# The organisation of statistical methodology and methodological research in national statistical offices

by Ivan P. Fellegi



December 2010

# The organisation of statistical methodology and methodological research in national statistical offices

Ivan P. Fellegi<sup>1</sup>

## Abstract

The paper explores and assesses the approaches used by statistical offices to ensure effective methodological input into their statistical practice. The tension between independence and relevance is a common theme: generally, methodologists have to work closely with the rest of the statistical organisation for their work to be relevant; but they also need to have a degree of independence to question the use of existing methods and to lead the introduction of new ones where needed. And, of course, there is a need for an effective research program which, on the one hand, has a degree of independence needed by any research program, but which, on the other hand, is sufficiently connected so that its work is both motivated by and feeds back into the daily work of the statistical office. The paper explores alternative modalities of organisation; leadership; planning and funding; the role of project teams; career development; external advisory committees; interaction with the academic community; and research.

Key Words: Methodology; Official statistics; Statistical organisation; Research; Relevance; Independence.

## 1. Introduction

It is a great honour to accept an award named after Joe Waksberg. Joe has been a close personal friend, as well a good friend of Statistics Canada.

I came to know Joe during his latter years in the Bureau of the Census when Morris Hansen asked me to become a member of what was then a most imposing methodology advisory committee of the Bureau chaired by Bill Cochran. Subsequently, in the late 1970s, when Statistics Canada had serious problems of image and of internal management, Statistics Canada asked a group of prominent statisticians to review what was wrong. At my recommendation, Joe was one of the three wise men asked to take part (the others being Richard Ruggles and the chairman, Claus Moser). Joe immediately agreed and in his inimitable low-key manner made invaluable contributions to Statistics Canada; the very helpful basic message being that while we had serious management problems, there was nothing much wrong with our methodology.

A few years ago the Census Bureau honoured me by asking to give one of their annual “wise elders” lectures. While I objected strongly on the grounds that I neither considered myself “wise”, nor “elder”, in the end I accepted their kind invitation. With typical grace, Joe took the time to show up for my talk, even though he was well into the middle of his eighties but still very busy as chairman of the board of WESTAT. We had a really good chat; and that was the last time I saw him. What a career; what a life!

So it is not only a professional honour to accept the Waksberg Award, but also a personal pleasure to be associated with Joe one more time.

I was told that generally the recipients of the Waksberg Award give an overview of an area of methodology. But while, as you know, I did spend the first half of my career as a methodologist, I stopped being a practitioner some decades ago – although I am still an ardent advocate (see Fellegi 2004). So I thought I would join the first half of my career – methodology – to the second half – management of statistical offices. I shall therefore, talk about the lessons I learnt about the organisation of applied methodological work and methodology research in national statistical offices; what works well and what less so (I assume that the basic conditions for an effective methodology function exist: there is a supply of trained statisticians in the country, the statistical office has a functioning infrastructure, salaries, if they are not competitive, are at least within sight of what is offered in the private sector, and so on).

I have two overall themes. Managing the tension between independence and relevance is one of them: generally, methodologists must work closely with the rest of the statistical organisation for their work to be relevant. Indeed, they must strive to serve the objectives of external clients, represented inside the office by subject matter experts. However, for them to be effective they must enjoy the necessary independence to question the use of existing methods, and to champion new ones if they believe they could reduce costs or increase statistical quality.

But the effectiveness of methodology also depends on a strong methodology research capacity which, on the one hand, has the necessary independence needed by any research program, but which, on the other hand, is sufficiently connected to on-going work so that it is both motivated by and feeds back into the daily practice of the

1. Ivan P. Fellegi is Chief Statistician Emeritus at Statistics Canada. E-mail: [ivan.p.fellegi@statcan.gc.ca](mailto:ivan.p.fellegi@statcan.gc.ca).

statistical office. The organisation of methodology research will be my second them.

But first I want to define what I mean in the present context by the terms *methodology*, *relevance* and *independence*.

## 2. Some definitions

### *Methodology*

The unique service performed by *methodology* is to maximise statistical quality given an imposed budget (or conversely). They do so through the application of statistical practice that is either based on statistical theory or on organized empirical observation. In other words methodologists are wizards of the relevant statistical theories; but also of “organised empirical observation” where formal theory abandons us. By organised empirical evidence I mean designed experiments or analytically assessed experience. So I am including all organized knowledge about the use of methods and approaches that result in the objective of maximising quality within a budget – or conversely, minimising the budget needed to achieve a stated quality level.

This would include such things as sample design, estimation, data editing, imputation, exploitation of administrative data, record linkage, seasonal adjustment, questionnaire design, measurement of accuracy and quality assurance of censuses and surveys, the use of experimental designs, and so on.

Methodologists are predominantly mathematical statisticians and they work on the applied end of their subject. Because of the interdisciplinary nature of official statistics they interact with survey managers, experts in data collection, IT personnel, geographers, sociologists, economists, *etc.*

### *Relevance*

Methodology is *relevant* if the day to day practice of the statistical office is actually based on sound methodology. A major issue in the organization of methodology is how to balance the intrinsically service nature of methodology against the need for the function to provide strong and effective guidance. Much of the paper will deal with all those arrangements needed to ensure the objective of relevance.

In the case of methodological *research*, relevance means that the research is both motivated by and informs applied work.

### *Independence*

The notion of independence of methodology means the ability to provide sound methodological guidance to projects, irrespective of the hierarchical arrangement of line

organisations that *can be debated but not ignored*; and that this debate is based on evidence, not authority. So my definition of independence is not that methodologists should be able to “do their own thing” but rather that they should have an authoritative voice.

Independence is frequently contrasted with relevance. Since relevance is about embedding methodology into practice, this is often attempted by building methodological services right into the fabric of subject matter organisations. By contrast, independence is thought to be enhanced by giving methodologists their own organisation(s). In this sense, therefore, there is a tension between the two. However, I would argue that relevance cannot be achieved if methodological guidance is ignored, so appropriate arrangements to ensure independence are necessary for relevance.

Independence of *methodological research* is different: it is generally meant to refer to an environment in which researchers have predominant say in the choice of their topics. Clearly, providing researchers with such an environment does create a permanent tension with the need to be relevant at all times, particularly when it is not at all obvious in the short term where the relevance lies.

In my discussion of how to balance relevance and independence of both the applied methodology function and of methodology research I will describe not only organisational arrangements, but a wide variety of tools and arrangements that should be considered in the pursuit of this objective. I shall use Statistics Canada as a concrete illustration. What I wish to emphasize is that the issue is much more complicated than what the terms “centralisation” and “decentralisation” denote for whichever of these basic organisational arrangements is adopted, many additional tools are needed to offset their disadvantages while maintaining their intrinsic advantages. Indeed, I have organised the rest of the paper around a discussion of the main tools (in choosing these tools for discussion, I borrowed from the paper by Brackstone 1997) involved under the following headings:

- Organisation;
- Leadership;
- Planning and funding;
- Project teams;
- Career development;
- Advisory Committees;
- Interaction with the academic community; and
- Research.

## 3. Organisation

### *General thoughts*

National statistical offices differ in the way they organise their methodology functions. In some it is distributed to

individual parts of the agency, each responsible for a given subject (e.g., labour). In other agencies decentralisation is only partial, e.g., to broader subject matter areas (such as demography or business statistics). The US Bureau of the Census, for example has largely decentralised its methodology function. By contrast, Statistics Canada and the Australian Bureau of Statistics have largely centralised it. Many factors influence the organizational choice. For example, in France and in India where all professionals share similar background in statistics and are largely recruited from a single teaching institution the accent is obviously on centralizing training and to a lesser extent research.

The traditional arguments are that decentralisation favours relevance and centralisation favours independence. However, the aim should be to have both. That being the case the question is how we can enhance independence in the case of decentralised methodology organisations, and relevance in the case of centralised ones.

Decentralisation, while potentially serving to underscore relevance, has some built-in disadvantages. Since each unit to which methodology is decentralized is necessarily smaller than it would be in more centralized options, it is less likely to facilitate specialisation and research. It is also less likely to encourage cross-fertilisation by methodologists working on other issues. Also, since the line organisations to which methodology is decentralised are typically not headed by methodologists, this model tends to result in lower hierarchical positions for the heads of the decentralised methodology units. In case of “conflicts” – and these will be inevitable because of different perceptions of priority, cost, quality and so on - other things being equal it will be more difficult for methodologists to defend their professional advice. If left without a counterweight, this kind of organization could get out of balance.

A critical counterweight could be a “chief methodologist” who reports directly to the head of the statistical office and inevitably is called upon to play an important role in long term planning and resource allocation. The “Chief Methodologist” could have his hand strengthened if given direct line responsibility for a strong research and development function which could serve as the “intellectual home base” for the decentralised methodology staff.

Project teams, brought together for large developments, are another important tool to enhance independence in the case of centralised organisations. Such projects – which if at all significant are necessarily multi-disciplinary – are carried out by ad hoc project teams which operate off-line from the agency’s line organization. The organization of project teams is a matter to which Statistics Canada devoted considerable attention and it has been refined over time. Among its elements there is the feature that whenever

professional disputes within the teams arise and the team believes that their solution requires outside intervention, the dispute is referred to a senior group of which someone from the staff of the “chief methodologist” is a member (this is automatically the case if the methodologist comes from a centralised group). It is this senior steering group that can contribute to protecting independence.

Consideration might also be given to providing some additional tools for the “chief methodologist”: he could be authorised and funded to develop a strong methodology training program; he could be given a strong role in the allocation and career development of the methodology staff; he could be supported by a strong external advisory committee; and so on. These features recognize that the role of “chief methodologist” is particularly delicate and could become more so if his place in the hierarchy were dependent on the size of the staff he controls directly without provision – as there is in some countries – to have his level of access and place in the ladder depend on his personal prestige rather than on the size or level of supporting staff.

#### *Centralisation: the Statistics Canada model*

Many years ago Statistics Canada opted for the centralised model (see Fellegi 1996) and that option was never seriously challenged (it was challenged for a brief period of time in the late seventies but in concrete terms the challenge did not get anywhere), and put in place a number of practices designed to reduce the threat that centralisation might result in diminished relevance.

1. Project teams: These are inter-disciplinary and include as a matter of course a methodologist but they are headed by a project manager whose association with the project is subject matter and who is likely to assume operational responsibility for the completed project.
2. Funding: much of the funding for the methodology function is controlled by the rest of Statistics Canada. Program areas (within limits that I will describe further) are free to spend their money on buying methodology services or not so long as they do not fall foul of the agency’s quality norms and accepted standards. With their budget largely on the line year after year, this accountability means that it is very much in the interest of methodologists to be responsive to the needs of the Agency’s Programs.
3. Organisation of the methodology function: it largely parallels the organisation of Statistics Canada. There are four methodology divisions: three of them provide methodology input to three different areas of the agency, while the fourth is devoted to research. In

fact, the three applied methodology divisions are themselves organised by subject matter in parallel with the manner in which the bureau is organised (regular rotation of methodology staff ensures broad development opportunities for methodologists).

4. Co-location of methodology staff: methodologists are occasionally physically moved to the offices of the subject matter areas whose surveys they help to design. This is an additional measure taken to ensure that they focus on the right issues.
5. Finally, as a matter of sound practice, methodologists conduct – and follow up on the results of – client satisfaction surveys which provide feedback on all aspects of their performance and first and foremost on the relevance thereof.

#### 4. Leadership

##### *General thoughts*

Leadership is crucial. The leader of the methodology function, in addition to a proper academic background and a great deal of experience in methodology, must possess a strategic vision and a personality that inspires confidence. This is an intrinsically difficult function. In the overwhelming majority of offices operational and subject matter considerations are the ones that receive the most attention. In such an environment an authoritative voice for methodology is needed to ensure adequate resources for the methodology function itself, but even more importantly to lead the *entire agency* in directions that are technically sound, and conversely to hold back initiatives that cannot be supported by sound methodology. “Soundly based” involves more than good survey design that uses the best available current knowledge. It also includes the notion of strategic planning of research, experiments and pilot surveys so as to improve the likelihood that whatever knowledge will be needed in the future will be available. For the opinions of methodologists to make a proper impact they must be supported by a leader whose unchallenged personal competence is combined with a seat at the statistical agency’s most senior table

If methodologists do not belong to a central organization within the statistical agency it is all the more important for their senior representative to be highly placed in the hierarchy since under a decentralized scheme he would not have direct line authority for (the bulk of) methodology resources.

##### *Centralisation: the Statistics Canada model*

Centralisation provides another lever to enable the leader of the methodology function to carry out his proper role as it

enables him to make rational and authoritative assignments of the resources under his direction to the most strategic projects. The top advocate of sound methodology in Statistics Canada has the status of Assistant Chief Statistician (ACS) – the rank immediately below that of the Chief Statistician of Canada. In order to secure such a high position in a government bureaucracy, the line responsibility of the ACS (Methodology) includes statistical standards (classifications and central registers), as well as informatics (IT). While the position is therefore responsible for more than methodology, it is by long tradition (over 35 years) filled by someone who is a noted expert on methodology and can therefore speak at the top table authoritatively about its importance in general as well as in the context of particular projects.

#### 5. Planning and funding

##### *General thoughts*

The effective functioning of methodology (as indeed the entire statistical office) greatly depends on the existence of a proper planning system (see Fellegi 1992 and Brackstone 1991):

- Planning is a necessary condition to ensure that resources are allocated rationally at all times.
- It also serves to mark explicitly the beginning and the end of development projects and therefore constitutes the ideal opportunity for methodology to “sign off” on the proposed design of new projects.
- Lastly, the planning system creates an opportunity for methodology to make an explicit judgement on whether a planned new venture can respect simultaneously its budgetary constraints, the agency’s quality standards, and the expected maintenance bill. In fact, the planning system also provides an opportunity for all representatives of the disciplines involved in the creation of a new project (its planning or its implementation) to “sign off” as a mark of assuming professional responsibility for the adequacy of its funding or for the integrity of its functioning.

Such a planning system is essential where the main disciplines (methodology, systems development, data collection, *etc.*) are centralised for otherwise the organisations responsible cannot make provisions for the needed resources. But, for more subtle reasons, decentralised offices need it just as much: to provide an explicit forum for the leaders of methodology (and, indeed, other key disciplines), to make their input during the critical formative stages of new projects.

*Centralisation: the Statistics Canada model*

Every new project or major redesign is approved within Statistics Canada's planning system. In preparation for its consideration, a comprehensive budget is developed and all major disciplines which are required to contribute sign off on the appropriateness of the proposed design and operational modalities. If the project is approved, its budget is divided up and distributed to participating disciplines, including methodology. In turn, these organisations "contract" to deliver the agreed contributions within the approved budgets. A project manager oversees both progress and expenditures, with authority to reassign resources, if necessary.

The budget of the Methodology organization is composed of five distinct sources. These are designed, on the one hand, to facilitate the sound planning of the use of methodology and its thorough integration into the work of the Agency, and on the other to secure for it the needed funding.

1. The contribution of methodology to *developmental* projects is guaranteed by the planning process of Statistics Canada, as indicated above. The financial contribution to the methodology budget from these sources may vary from year to year, but there is a reasonable overall stability (facilitating the hiring and development of permanent staff). They account for almost 30 per cent of the total methodology budget. These projects typically involve major redesigns, often with significant experimentation and innovation.
2. But methodological contributions are also needed for maintenance (quality control, monitoring of various errors including variance estimation where relevant, minor design adjustments, *etc.*). For these activities there are core resources set aside and more or less permanently allocated by broad subject matter. This constitutes the second component of the methodology budget and it accounts for somewhat less than 25%. While for methodology this "on-going" work accounts for less than 25% of their workload, for Statistics Canada as a whole "on-going" work accounts for over 90% of our budget. This is because of the innovative nature of methodology work.
3. A third component comes from supplementary resources funded directly by the beneficiary subject matter divisions who, in effect, make savings from their other expenditures to avail themselves of additional methodology contributions. These supplementary funds account for a by no means negligible 20% or so of the methodology budget. The very fact that subject matter divisions consider

methodology sufficiently valuable to fund methodological advice directly says a lot about the health of the relationship and of the extent to which it is valued. The funds in question are for a mixture of projects including enhancements short of a major redesign of on-going projects. They also strengthen the awareness of methodology staff of the need to remain relevant for their users. The kind of service they provide has a direct bearing on the amount of resources that are made available to them.

4. The fourth part of the methodology budget (about 20 per cent) comes from externally funded projects, typically from the budget of surveys funded by other departments. No more needs to be said about them.
5. The final part (7 per cent) is for research. This is a "block fund", meaning that a certain fixed amount of funds is allocated for the research function. The annual allocation is governed by a mechanism described below.

The intricacies of the funding mechanism and the multiplicity of funding sources are a reflection of the care exercised in the agency to balance the virtues of independence with those of relevance.

## 6. Project teams

*General thoughts*

The use of project teams in developmental projects helps to strengthen relevance without it being necessarily at the expense of independence. But project teams are not a universal panacea as everything depends on establishing appropriate checks and balances. In centralised organisations project teams, most often headed by a project manager from the sponsoring subject matter area, help to nudge the participating methodology staff to pay proper attention to the objectives and constraints of projects. Nonetheless there remains an inherent danger that the project manager will not give sufficient weight to the considered advice of methodologists.

Project teams in decentralised organisations are just as important to ensure that the views of methodologists are given appropriate weight. Here, however, the dice are clearly weighted in favour of relevance and against independence. Moreover, an exaggerated emphasis on "relevance" has its danger as well since it can lead to local optimisation. Local optimisation is a situation where surveys are optimised without regard to agency wide objectives. An example might be a situation where surveys are customised to an extent such that the introduction of important efficiencies through the use of agency-wide

standards and general systems becomes difficult (the widespread use of generalized approaches, systems and tools can be a source of considerable agency-wide efficiencies: they shorten implementation times, reduce the expenditure on both systems development and maintenance, facilitate staff rotation, *etc.* However, generalized systems might lack some features which could enhance the efficiency of any given operation. Decentralized organizations are more likely to favour such locally developed solutions in preference to agency-wide standard tools, even though the latter might lead to substantial *long-run* efficiencies).

#### *Centralisation: the case of Statistics Canada*

In Statistics Canada project teams working on major development projects are accountable and report to steering committees typically composed of the heads of the participating disciplines. A steering committee approves the broad project strategy, and serves, if needed, as a forum to which issues can be referred that could not be resolved within the team itself. In practice such appeals are rare and are restricted to cases where professional principles or truly strategic issues are involved. Steering committees ensure that issues do not get resolved within the project team on the basis of rank but rather on the basis of professional merit.

Methodologists serving on project teams carry out a dual function:

- At a strategic level, they help ensure that the overall survey design achieves the project's substantive objectives, while striking a balance between reliability, cost, timeliness and respondent burden. While striving for this balance concerns the entire project team it is the methodologists who provide the framework and techniques that must be considered in seeking the optimum balance.
- At a tactical level the methodologists provide the statistical methods and tools that are incorporated into the overall survey design: the sample design, the estimation and weighting approach, quality control, editing and imputation strategies, coverage checks, analytic methods and the like.

Project teams function best in an organisation dedicated to making decisions on the basis of merit; where everyone can pose questions and expect reasoned answers; one that is devoted to making maximum use of the expertise of everyone involved.

## **7. Career development**

### *General considerations*

Career development is essential for all professional groups, and it involves both formal training as well as

formal and informal approaches to facilitate on-the-job learning. Methodology staff, in my view, requires special attention in this respect. The reason is that universities in general offer few, if any, courses in survey methodology (there is an increasing number of exceptions, although their numbers are still far from overwhelming. A most notable one is the Joint Program in Survey Methodology, University of Maryland. But there are also degree programs on official statistics in the UK, Ireland and New Zealand which include survey methodology). Since a thorough professional knowledge is essential for both relevance and independence, most statistical offices wanting to maintain a strong methodology staff have no alternative to having a carefully designed career development program – whether methodology is organised in a centralised or decentralised manner.

For the courses to be relevant, it is desirable that a substantial portion of courses should be taught by staff members who are themselves active practitioners. This is easier arranged in centralised organisations where the senior methodologists can not only deploy staff to do teaching (typically on a part time basis), but can also arrange suitable replacements for them in their current project work.

The broader aspects of career development are also easier arranged in centralised organisations: they can more readily manage the periodic assignment of staff to different types of survey work, attendance at scientific conferences, the provision of research opportunities to those interested in and capable of doing part-time research work, and most importantly the service of apprenticeships under more experienced methodologists.

### *The case of Statistics Canada*

Training, not only in methodology, is emphasized by Statistics Canada (see Statistics Canada 1995). Overall, expenses on training amount to about 3% of its budget (or \$15 million) on formal training – plus a great deal more on various means of career development. But, in line with the centrality of training in methodology, the percentage of methodology budget spent on it is almost twice as much (bordering on 6 per cent in the 2008-09 fiscal year).

Training is provided in formal courses within Statistics Canada's Training Institute which currently (in 2009) offers some 20 courses in methodology, ranging in level from introductory courses to graduate level material. Most courses are taught by in-house staff, occasionally university personnel, mostly from local universities, are engaged if they are interested to teach and/or help develop our staff in other ways (*e.g.*, consultation) (in the latter modality we have been particularly fortunate in having had the contributions of Professor J.N.K. Rao of Carleton University over a period of some decades).

All recruits have to take a basic six weeks course which teaches (and provides practice in) survey design, survey operations, processing and analysis. This introductory training serves a multiplicity of purposes. Since the same basic six-week course in survey work is taken by *all* new professionals, it helps early on to inculcate in everyone a basic knowledge of all that is involved in survey work ; and, even more importantly, to drive home the critical importance of inter-disciplinary team work. It is also at this stage that new recruits from other disciplines are exposed for the first time to the requirements of methodology in survey design

Career development involves much more than training. The staff, particularly at the earlier stage of their career, is regularly given opportunities to work on different types of work: demographic, socio-economic, business surveys, use of administrative records, record linkage, *etc.* Significant numbers also attend scientific conferences. For example, during the last several years some 17 per cent of the methodology staff attended various Canadian and international professional conferences per annum. Staff is also encouraged to work on research projects and publish findings in peer reviewed journals, including Statistics Canada's *Survey Methodology*. Finally, for many years now Statistics Canada has organised an international methodology symposium to which leading research personnel from around the world are invited. These symposia are, of course, open to all Statistics Canada personnel and most methodologists choose to attend them.

## 8. Advisory Committee

### *General considerations*

A Methodology Advisory Committee can serve a most useful function (a) ensuring sound methodology practices, (b) integrating these practices into the daily work of statistical organisations, and (c) training staff. But the Committee can only be effective if (a) its advice is sought on significant issues of methodology and (b) there are mechanisms to ensure that the Committee's views are given due weight. I have observed Methodology Advisory Committees playing an equally useful role in a centralised office (Statistics Canada) and in a decentralised one (the Bureau of the Census in the 1960s).

### *The case of Statistics Canada*

Statistics Canada's Methodology Advisory Committee plays a key role. There are several factors that contribute to its usefulness and standing:

- The personal standing of the Committee's members is part of the reason.
- Every significant project of Statistics Canada is referred to the Committee for advice.
- The Committee's review is facilitated by the preparation of a paper for each item of the agenda which is introduced by a brief oral presentation by staff.
- Designated members of the Committee serve as formal discussants of each item on the agenda. The discussants present their views formally. Given that most of the papers are prepared by mid-career staff, these discussions make not only a substantive contribution to the projects that are discussed, but also to the training of the staff concerned – and that of the audience.
- Meetings of the Committee are attended not only by a large number of the relevant methodologists, but also by senior personnel of the subject matter division concerned, including often the Chief Statistician as well as one or two of his assistants.
- The Committee meets regularly: twice a year, for a day and a half on each occasion.
- The Committee regularly reviews the follow-up arising from its conclusions and formal recommendations; this helps ensure that their advice is taken seriously.

## 9. Research

### *General considerations*

I am taking it for granted that for this audience I do not need to spend time underscoring the intrinsic importance of research in a statistical agency. But let me stress the following points:

- Careful thought should be given to organising the research function in a manner that maximises both its relevance and the likelihood that its benefits will be successfully transmitted into daily practice. It is crucial to avoid the twin dangers of research being self-serving, or alternatively so completely task-oriented that it becomes pedestrian.
- Research needs to be adequately funded.
- In-house research needs to develop and to maintain close links with relevant extramural research.

### *The case of Statistics Canada*

One of the four methodology divisions is formally devoted to full time research. But the research is organised in a particular manner. Even though the research budget provides for the equivalent of 22 full time research staff, the research division itself has only six full time members. The remaining budget is assigned to finance the part-time research work of some other 70 methodologists. This arrangement serves a variety of purposes. First, it contributes to the relevance of research. Secondly, it



contributes to the adoption of the results of research. And thirdly, it helps morale for while not everyone wants to do research (or is able to do so), many want to try their hand at it. And the very act of conducting some research, by those capable of it, leads to more open mindsets and a better informed practice.

We are trying to ensure that the particular projects approved for research are in line with the broad research priorities of Statistics Canada, but at the same time leave some scope for self-initiated research. We do this by establishing broad priorities each year and inviting proposals in those areas from staff. The proposals are subject to formal adjudication: the best ones are selected and staff are assigned to work on them. Senior advice and guidance is provided by the Director of the Statistical Research and Innovation Division and its small permanent staff.

The following are additional measures that help the quality of research carried out:

- The possibility of publishing papers in *Survey Methodology*, Statistics Canada's own publication, serves as an incentive. While the peer review of the articles is rigorously managed by an international editorial board, the existence of a local yet prestigious outlet for methodology research represents a visible commitment by senior management.
- We regularly co-author papers with well known external research personnel (both Canadian and non-Canadian).
- We hold regular methodology interchanges with methodology staff in the US Bureaus of the Census and of Labour Statistics.
- We participate actively in Canadian, American and international statistical organisations.

## 10. Concluding comments

As indicated in the introduction, the bulk of the paper was devoted to the tools that should be considered by statistical offices in establishing and supporting the methodology function and the associated research, tools that in appropriate combination can enhance both the professional independence as well as the relevance of the function. I want to emphasise, however, that this is not a cook book. More important than all the tools is the environment: whether the statistical office welcomes

questioning and ensures that substantive questions are answered in substance; whether change is intrinsically frowned upon; whether it fosters collegiality; whether intelligent risk taking is encouraged or frowned upon; whether experiments are welcomed, assessed on their merits, and acted upon. These are the attributes that come from the top leadership of the statistical office and tools cannot substitute for them. Under the wrong leadership the best methodology staff (or, indeed, the best statistical office itself) will wither. But the contrary is not true: it is essential to have a careful understanding of the subtle balances advocated in this paper, as well as a careful deployment of the tools that give them effect. And even then, only a long term strategy can succeed.

I am completely certain that Joe would agree with my conclusion (see Waksberg 1998).

## References

- Brackstone, G.J. (1991). Shaping statistical services to satisfy user needs. *Statistical Journal of the United Nations Economic Commission for Europe*, 8, 3/4, 243-258.
- Brackstone, G. (1997). Organization of a survey methodology service. *Enquêtes et sondages : Méthodes, modèles, applications, nouvelles approches*, (Eds., G. Brossier and A.-M. Dussaix), Rennes, France, June 19-20, 3, 118-134.
- Fellegi, I.P. (1991). Maintaining public confidence in official statistics. *Journal of the Royal Statistical Society, Series A (Statistics in Society)*, 154, Part 1, 1-6.
- Fellegi, I.P. (1992). Planning and Priority Setting - the Canadian Experience. In *Statistics in the Democratic Process at the End of the 20<sup>th</sup> Century*, (Eds., Hölder, Malaguerra and Vukovich); Anniversary publication for the 40<sup>th</sup> Plenary Session of the Conference of European Statisticians. Published by the Federal Statistical Office, Wiesbaden, Federal Republic of Germany.
- Fellegi, I.P. (1996). Characteristics of an effective statistical system. *International Statistical Review*, 64, 2, 165-199.
- Fellegi, I.P. (2004). Maintaining the credibility of official statistics. *Statistical Journal of the United Nations*, ECE 21, 191-198.
- Statistics Canada (1995). Training and Development at Statistics Canada. Statistics Canada Training Institute, March 1995.
- Waksberg, J. (1998). The Hansen Era: Statistical research and its implementation at the U.S. Census Bureau, 1940-1970. *Journal of Official Statistics*, 14, 2, 119-135.