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EVALUATION OF IMPACT ASSESSMENT ACTIVITY
FOR THE
EVALUATION OF THE OFFICE
COMMUNICATIONS SYSTEMS PROGRAM

Background Study

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EVALUATION OF THE OFFICE
COMMUNICATIONS SYSTEMS PROGRAM

DECEMBER, 1985

DOC
PROGRAM EVALUATION SERIES

This is one of seven Background Studies that form part of the evaluation of the Office Communications Systems Program.

The Study was prepared by Price Waterhouse Associates for the Program Evaluation Division of the Department of Communications, Canada.

The views expressed herein are those of the author and do not necessarily represent the views or policies of the Department of Communications.

DEPARTMENT OF COMMUNICATIONS

1. EVALUATION OF IMPACT ASSESSMENT
ACTIVITY } STUDY #2

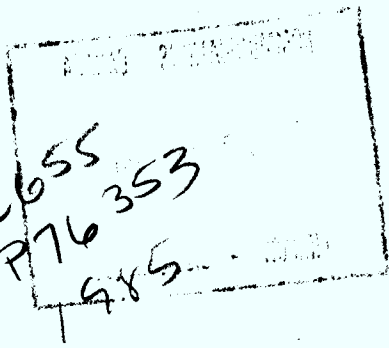
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DEPARTMENT OF COMMUNICATIONS

EVALUATION OF IMPACT ASSESSMENT

ACTIVITY: STUDY #2

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EXECUTIVE SUMMARY

Impact assessments were a built-in component of the Office Communication Systems (OCS) Program. The objective was: "to determine the impacts and effects, both intended and unintended, which Office Automation technology had on office productivity and on the people who work in the office."

This assignment entailed an examination of the quality of the impact assessment studies and the usefulness of the resulting information. The approach was the use of an expert panel to review the impact assessments according to a common set of questions. Written reports were prepared by experts who were asked to review particular assessments. These were discussed among the group of experts and conclusions were drawn for this report. Each expert read the report prepared by Price Waterhouse to ensure their views were fully and accurately presented.

The focus of the review was on the planning of the impact assessments because: (1) the implementation problems of the field trials had major consequences for the impact assessments and these had to be taken into account in the design of the studies; and (2) there were final reports for only two studies at the time of our review.

Our findings fall under three headings: (1) the Department's terms of reference; (2) the consulting firms' study plans; and (3) the approach used in the impact assessments.

The findings related to Department's Request for Proposals (RFP) which include the terms of reference for the studies are:

- . The RFP called for both formative and summative evaluation without recognition that the former should precede and contribute toward the plans of the latter.
- . There was an overly comprehensive set of issues designed to meet the needs of multiple users.



- . There were no contingency plans to guide the impact assessments according to the stage of the field trials' implementation.
- . Making contractors dependent on the vendor for systems data meant that the contractors could not control the collection and analysis of this data with their planned approach for the impact assessment.

The findings related to the plans for the studies are similar to these presented above, reflecting the fact that issues in the terms of reference were essentially adopted by the consultants.

- . There was little attempt to narrow the number of issues and to select the most important dimensions of issues that were most directly related to the field trial.
- . Plans did not adequately reflect the realities of the field trials although they were some ad hoc adjustments to examine issues of program implementation.

We addressed broad concerns related to the approach rather than detailed methodological issues. Our findings were:

- . The emphasis on measuring summative impacts was unwarranted in light of the developmental nature of the field trials.
- . Modified approaches to address implementation issues was appropriate but not formally planned or approved.
- . There was no established mechanism for formative feedback.

There are several lessons which can be learned from the impact assessment component of the OCS Program.

1. Impact assessments must be planned and managed to take into account the specific nature of the product and its readiness for implementation in the field.
2. Terms of reference should have a built-in contingency plan.
3. The scope of impact assessments should be limited to help ensure valid and reliable measurement within the constraints of time and available budget.



4. The nature of the issues should be clarified before measurements are selected and/or developed.
5. Coordination is required among impact assessments to learn from each other and for drawing conclusions about the set of field trials.



SOMMAIRE EXECUTIF

Les évaluations d'impact étaient une composante intégrale du Programme de la bureautique. L'objectif était de déterminer l'impact et les effets, voulus et inattendus, que la bureautique a sur la productivité et sur les personnes qui travaillaient dans le bureau.

Ce projet impliquait l'examen de la qualité des évaluations d'impact et de l'utilité des résultats obtenus. Un groupe d'experts ont révisé les évaluations d'impact en utilisant un jeu de questions commun. Des rapports écrits ont été préparé et discuté par ces experts. Certaines conclusions en ont été tirées pour ce rapport. Chaque expert a lu le rapport préparé par Price Waterhouse afin de s'assurer que leurs opinions étaient bien représentées.

Le point focal de la révision concernait la planification des évaluations d'impact parce que: (1) les problèmes de la mise en oeuvre des essais sur place ont eu des conséquences importantes pour les évaluations d'impact et ont dû être considérées lors de la préparation des études; et (2) il n'y avait de rapport final que pour deux études lors de notre révision.

Nos résultats tombent dans trois catégories: (1) le mandat du ministère; (2) les plans pour les études de la firme de consultation; (3) l'approche utilisée dans les évaluations d'impact.

Les résultats reliés à la demande du ministère (ce qui inclut le mandat des études) sont:

- Le ministère a demandé une évaluation formative et une évaluation sommative sans indiquer que la première devrait précéder la seconde et contribuer à ces plans.
- Il y avait un ensemble très complet de questions importantes destinées à rencontrer les besoins des divers utilisateurs.
- Il n'y avait pas de plans contingents pour guider les évaluations d'impact par rapport au niveau de la mise en oeuvre des essais sur place.



- Rendre le contractant dépendant du fournisseur face aux systèmes de données impliquait que le contractant ne peut pas contrôler la collection et l'analyse des données avec leur approche pour l'évaluation de l'impact.

Les résultats quant aux plans pour les études sont similaires à ceux mentionnés ci-haut, reflétant le fait que les questions importantes incluses dans le mandat ont été principalement adoptées par les consultants.

- Il n'y a pas eu d'effort important afin de diminuer le nombre de questions et de choisir les aspects des questions qui sont directement reliés aux essais sur place.
- Les plans ne reflétaient pas adéquatement les réalités des essais sur place malgré le fait qu'il y a eu des ajustements ad hoc afin d'examiner certaines questions quant à la mise en oeuvre du programme.

Nous nous sommes souciés de problèmes généraux concernant l'approche plutôt que questions méthodologiques trop détaillées. Nos résultats sont:

- L'accent sur la mesure sommative de l'impact n'était pas justifiée dû à la nature préliminaire des essais sur place.
- Des approches modifiées pour répondre aux problèmes de la mise en oeuvre étaient appropriées mais n'étaient pas planifiées ni approuvées.
- Il n'y avait aucun mécanisme pour communiquer des problèmes concernant des essais sur place.

Il y a quelques leçons à tirer de l'évaluation de l'impact du Programme de la bureaucratie.

1. L'évaluation de l'impact doit être planifiée et gérée de façon à tenir compte de la nature spécifique du produit et de sa facilité de la mise en oeuvre.
2. Le mandat devrait inclure un plan contingent.
3. L'étendue de l'évaluation devrait être limitée afin de s'assurer qu'une mesure valide et sûre puisse être faite dans un cadre de temps restreint et budget disponible.



4. La nature des questions importantes devrait être clarifiée avant de choisir des mesures.
5. Une certaine coordination est nécessaire entre les évaluations d'impact afin d'apprendre de chacun et de tirer des conclusions en ce qui regarde un ensemble d'essais sur place.



INTRODUCTION

The Office Communication Systems (OCS) Program which took place between 1980-81 and 1985-86 had the following objectives: "to provide a governmental focus and impetus which will lead to the development and sustence of a Canadian based office automation industrial infrastructure." The primary vehicle for pursuing this objective was the implementation of field trials in five departments with built-in impact assessments. The chart below provides information on the participants and budgets for the field trials and their impact assessments.

Host Department	Vendor	Field Trial Budget	Contractor for Impact Assessment	Impact Assessment Budget
Customs & Excise	Bell Northern Research	\$3.0 M	Engel and Townsend	\$147,500
Environment Canada	OCRA Communications Inc.	\$3.0 M	Wescan	\$151,500
Department of Communications	Bytec-Comterm	\$500 K	Mount St. Vincent	\$103,722
Department of National Defence	Systemhouse	\$2.8 M	Abt Associates	\$150,000
Energy, Mines and Resources	Officesmiths	\$700 K	Socioscope	\$ 40,000

An inherent feature of field trials is some type of impact assessment to document the lessons learned from a test situation. The need for an impact assessment of the OCS Program was recognized early in a Technical Memorandum (1980) circulated by the Behavioural Research Group in the Department of Communications. However, formal planning for the impact assessments did not begin until late 1982.



There were three separate terms of reference for impact assessments which were separately managed. They were launched in the following order:

- 1) Energy, Mines and Resources;
- 2) Customs and Excise, Environment Canada, and Department of National Defence; and
- 3) Department of Communications.

The terms of reference for all the impact assessments were essentially the same. The objective was: "to determine the impacts and effects, both intended and unintended, which Office Automation technology has on office productivity and on the people who work in the office."

The conduct of the impact assessments must be integrated with the implementation of the field trial itself. "Before" or baseline measures are taken prior to the introduction of a product (i.e., the particular office communication system). The acceptance or absorption of the product in the office is typically monitored during the implementation phase. "After" measures are then carried out to provide the basis for assessing changes.

There were serious problems with the field trials which had major effects on the impact assessments. The following history of the OCS Program describes the context in which the impact assessments occurred and highlights those aspects of the field trials which affected the conduct of the impact assessments.

HISTORY OF OCS PROGRAM*

Treasury Board approval for the OCS Program was obtained on October 16, 1980. The proposal for the OCS Program included two phases. Phase 1 was expected to last until the fiscal year 1981/82 and it received \$2.5 million and three person years. In fiscal year 1980/81, the budget breakdown was as follows:

- development of functional specifications for possible products and integrated systems and limited field trials of partial systems -- \$600,000;
- behavioural studies to determine impact of automation on the office environment -- \$200,000; and

*This history is excerpted from a more complete history of the program provided in the report -- An Analysis of Program Delivery: Office Communications System Program, September, 1985.

- program management and planning -- \$200,000.

In the second year, \$1 million would be spent for the continuation and completion of the partial system field trials and the remaining \$500,000 would be equally split between behavioural/human factor studies and program management. This proposal for Phase I also described the next phase.

There was an estimate that Phase 2 would last three years and the resources required for this phase would be under \$10 million. It was viewed as a sunset program and there would be no commitment from, or liability against, the government beyond that point.

The objective stated for the OCS Program was:

"to influence the ability of Canadian industry to participate in the rapidly growing "office of the future" marketplace".

The role of government would be to encourage Canadian industry to organize itself. The government would develop interconnection standards as well as overall systems concepts. It would also serve as the catalyst in getting companies to work together.

Providing an opportunity for field testing was a critical feature of the OCS Program since it was considered as an important bridge between product development and commercialization of the product. The host departments would provide this opportunity for industry to test their products. Benefits were identified for the vendors, host departments, the federal government as a whole, and the Canadian economy. The industry would increase its competitiveness and be able to grow with the market for products that were developed. The host departments would be able to take the lead in introducing advanced office equipment and this experience could be applied to other departments. There were also major economic benefits identified such as high level jobs created (in management, marketing, production and engineering) and increased export earnings stemming the flow of imports of office communication equipment.



Phase 1 started in January, 1981, when the Director and Field Trial Manager of the OCS Program were appointed. Their initial responsibilities were to establish the office and to plan the implementation of activities which were outlined for Phase 1. Among the early tasks carried out was the creation of a OCS Users' Group Committee and an OCS Industry Consultative Committee.

Arrangements were made to obtain consulting services to explore the feasibility of field trials and to develop methods of operationalizing them. The research activities began with the award of four contracts. There were also mini field trials implemented during this period.

The OCS Program management had decided to support several field trials rather than limit the funds to a single trial by one group. While there were no formal criteria for selection of vendors, major factors considered included: the financial health of the company, the type and quality of product proposed, and perceived ability to deliver the system.

In organizing these field trials, the management of the OCS Program accepted the role as broker between the suppliers and interested departments. The major event in this broker role was the arrangement of a meeting in December 1981, at which six vendors made presentations to representatives of 20 different departments. Eight departments volunteered to act as a host for a field trial and six companies made proposals to conduct such a field trial. There were meetings between the vendors and interested departments to explore the compatibility of their interests. In addition to acting as a broker, the OCS Program provided funds to companies for the purpose of conducting feasibility studies of field trials in the interested departments. BNR received \$73,550 to conduct surveys in several government departments to identify an appropriate department in which to conduct a field trial of its system. This process led to agreements in principle by four host departments and four vendors.

Program management decided to cut Phase 1 short by one year which would save \$1.5 million because of its strategic decision to concentrate on fewer projects than originally envisioned in the Phase 1 plan. The proposal for Phase 2



indicated that the feasible and desirable way of proceeding would be with the field trials approach which had been confirmed in Phase 1. Moreover, there were already agreements in existence between host departments and the vendors to carry out field trials.

The Phase 2 proposal also included the addition of objectives concerning the behavioral and social impact of office communications systems. These were the result of a groundswell of concern regarding the potential impacts of office automation by women's groups, labor groups and others.

Cabinet approved funding for Phase 2 on April 6, 1982 and a public announcement of Phase 2 was made on June 8, 1982 at a press conference by Ministers' Fox, Gray and Erola. Treasury Board approved funds but no PY allocation for Phase 2 in July 1982. In November 1982, Treasury Board's approval was obtained for 30 person years over 3 years to staff the OCS Program.

The program was staffed with seven professionals by January 1983. The OCS Program had initiated a total of 20 studies covering behavioural, economic, marketing, feasibility, and field trial activities at an expenditure of \$400,000.

Phase 2 strategy focussed on a series of major field trials in federal departments to take place over four fiscal years commencing in 1982-83 and terminating in 1985-86. The estimated cost for the major field trials was \$9 million and \$17.25 million for the whole program.

A special field trial was also proposed for the Department of Communications where senior departmental officials expressed the desire to implement and test integrated office automation systems to meet administrative requirements throughout the Department.

Phase 2 of the OCS Program involved the funding of field trials in host departments, impact assessments of these trials, continued funding of research projects, and public information activities. Impact assessments of the field



trial were planned for Phase 2 and \$350,000 was budgeted for this research. In March, 1983 the impact assessment budget was doubled by management to \$700,000.

A Technical Memorandum circulated in 1980 by the Behavioural Research Group outlined a strategy for conducting impact assessments of the field trials. However, formal planning for the impact assessments did not begin until late in 1982.

Several problems were encountered in implementing the field trials. First, there were no developed or "polished" products that were introduced to the host departments. This meant that these were not application trials but development trials. Second, the development trials required considerable more time than was planned for them. In March of 1984, a one year extension to OCS Program involving no allocation of person years or additional resources was approved by Treasury Board. These delays in the context of a sunset nature of the program left insufficient time for the impact assessment. These problems in the implementation and their relationship to the impact assessments is a major focus of this report.

OBJECTIVES OF THIS ASSIGNMENT

The primary purpose of this study was to examine the quality of the impact assessment studies and the usefulness of the information resulting from them. The problems in conducting the impact assessments as originally planned (due mainly to the delays and difficulties of the field trials) meant that only two assessments were available with final findings and these were not related to the measurement of impacts as specified in the terms of reference. Therefore, the objective of this study was modified and limited to an examination of the planning and conduct of the assessments.

APPROACH

The Program Evaluation Branch stipulated in the Terms of Reference that an expert panel be used to review the impact assessment studies. Our original



proposal indicated that we would prepare a rating form for the experts to use in reviewing the impact assessment studies. We intended to produce quantitative ratings along with some written narrative for: the terms of reference, plans, methodology and reporting of findings. However, prior to launching this assignment we became aware of factors that limited the usefulness of this approach. As mentioned earlier, there were final reports for only two of the impact assessments and therefore some of the topics could not be covered. The focus of the studies shifted from measuring impacts to examining the implementation process. This shift meant that each of the studies were somewhat unique in their focus and approach. The use of a common rating form designed for an impact study would not be appropriate in these situations.

We modified the approach to involve the expert panel in reviewing the impact assessments according to a standard set of questions which were developed to suite the particular situation of these field trials (see Appendix A). The experts were assigned particular assessments and asked to prepare written responses. These were discussed among the group of experts and general conclusions were drawn about the impact assessment component of the OCS Program. Price Waterhouse prepared the report reflecting the findings of the panel and circulated it to the expert reviewees to ensure that it properly captured the panel's conclusions. The feedback was then incorporated in the final report. We received the experts' concurrence on the content in the report.

Certain precautions concerning reviews of this type should be noted. First, it is always easier using hindsight to identify problems and shortcomings of research than it is to anticipate problems. More is know about issues such as the measurement of productivity and attitudes towards computerization than when the first Request for Proposal for an impact assessment was written. Second, our review focussed primarily on the written records and reports of the impact assessments. It was beyond the scope of our terms of reference to review information processes, correspondence and discussions between the OCS Program and consultants during the course of the assessment. However, the report was



reviewed with Program personnel involved in the impact assessments who provided background information not available from the documents. Third, the field trials were dynamic in nature and many implementation problems were experienced.

FINDINGS

The review panel agreed that the focus of the report should be on a relatively few major issues which had a profound effect on the impact assessment component of the OCS Program. These issues pertain mainly to the planning of the impact assessments rather than the conduct of the studies and the report. Such a focus reflects the overall concern about the inappropriateness of the terms of reference, the plans and the approaches used in relation to the realities of the field trial. Findings concerning each of these areas are summarized below. The first section presents the findings of the review panel concerning the terms of reference for the impact assessments. The second section describes the findings concerning the plans for the impact assessments and the third section the approaches used in assessing the impacts of the field trials are discussed.

1. TERMS OF REFERENCE

The terms of reference for the impact assessments are contained in the two Request for Proposals: one for the field trial at Energy, Mines and Resources; and the other for the field trials at the Department of Environment, Customs and Excise, and the Department of National Defence. There was no formal Request for Proposal for the impact assessment at the Department of Communications. Specific findings concerning the appropriateness of the terms of reference are outlined below.

1.1 Incompatibility of Simultaneously Pursuing Formative and Summative Research

It is essential to have clearly stated objectives for impact assessments to provide the basis for developing an appropriate approach. The distinction



between formative and summative evaluation is an important starting point for the specification of objectives. Formative evaluation, as stated in the Request for Proposal, provides "ongoing feedback about the issues throughout the course of a trial so that corrective actions can be implemented as problems are revealed." On the other hand, summative evaluation provides conclusions about the effectiveness of a program at a final stage.

Formative research was an appropriate approach to propose for the field trials which were developmental - i.e., the suppliers had Beta sites for product development. Summative evaluation would have been appropriate if there was a product to test (i.e., the original objective underlying the field trials).

In developmental field trials frequent changes are made in the products, making it difficult to clearly attribute final impacts to a specific product or intervention. While some implementation problems are expected when an office automation system is introduced, these implementation problems are likely compounded in a developmental field trial.

In these ways, a developmental field trial is different from a trial in which established office automation technology is used. Thus the developmental field trial does not provide an appropriate setting for the assessment of office automation technology on productivity and people who work in the office.

The Request for Proposal called for both formative and summative evaluation without recognition that the former should precede and contribute toward the plans for the latter. The pursuit of both simultaneously had the following consequences:

- confusion about the aim of the impact assessments - i.e., to identify impacts as opposed to measuring their occurrence and account for changes;
- lack of clarity about the examination of implementation - i.e., describing the implementation process and identifying implementation problems versus monitoring how the program was implemented to help explain the measured impacts;



PRIME ASSESSMENT ISSUES

I SYSTEM PERFORMANCE

- . SYSTEM UTILIZATION BY FEATURE/USERS
- . EASE OF USE & RESPONSIVENESS
- . SYSTEM ADAPTABILITY

II USERS' ACCEPTANCE

- . USER ATTITUDES
- . FUNCTIONALITY WITH RESPECT TO NEEDS
- . SUPPORT TO DECISION MAKING
- . REDUCTION OF INEFFICIENCIES
- . USER IDENTIFICATION OF SYSTEM ENHANCEMENTS

III HUMAN/SOCIAL

- . QUALITY OF WORK LIFE
- . HEALTH/SAFETY/STRESS
- . INCENTIVES/REWARDS/SANCTIONS
- . PRIVACY/SECURITY
- . EMPLOYEE MORALE/MOTIVATION
- . PHYSICAL ENVIRONMENT

IV ORGANIZATIONAL

- . DEMOGRAPHICS
- . WORK METHODS/PROCEDURES/POLICIES
- . TRAINING
- . EMPLOYMENT
- . LABOUR RELATIONS
- . EFFECTS ON ORGANIZATIONAL STRUCTURES & RELATIONSHIPS
- . POLICY

V PRODUCTIVITY

- . ATTAINMENT OF CORPORATE GOALS/OBJECTIVES
- . IMPROVEMENT IN CUSTOMER RELATIONS/SERVICE TO THE PUBLIC
- . COST/BENEFIT ANALYSIS

- conclusions could not possibly be drawn about the impact of a particular product because the formative evaluation was expected to facilitate its development; and
- considerable resources were spent to measure impacts in light of the summative objective when the more appropriate focus was formative.

1.2 Overly Comprehensive Set of Issues

The Request for Proposal identified 24 issues under 5 broad headings as shown on the opposite page. There was also a lengthy list of possible uses of the results by the following users:

- industry;
- host management;
- Department of Communications;
- Treasury Board and other departments/agencies; and
- Canadian public.

Each issue is complex, containing various dimensions which vary in importance among users. To develop valid and reliable measures within the budget and time frame for this set of issues was unrealistic. For example, the DOC Behavioral Research Group spent \$20,000 attempting to develop an attitude measure for Videotex. It was estimated another \$25-50,000 was required to validate this single scale. The development of reliable, valid measures of productivity would have been even more costly, as there was no agreed upon conceptual model of the scope and domain of measure of productivity.

Certain issues or their dimensions may not have much relevance for the particular technologies in the field trials. For example, the assessment of impacts on employment and staffing levels was not relevant because a condition of the field trials was that there would be no layoffs as a result of the use of new technology.

The selection of a relatively few priority issues and the specification of issues with respect to dimensions, information needs of users and key questions is essential for an impact assessment. This is normally carried out on an evaluation assessment. This opportunity to do this was somewhat limited by the late start of the impact assessment. There were two contracts issued by the

OCS Program in the Fall of 1982 to help develop the Request for Proposal and a full-time person was employed for this purpose in December 1982. However, this did not result in a manageable list of specific issues.

The first impact assessment of the field trial at Energy, Mines and Resources called for an evaluability assessment. However, it was not formally carried out. The other impact assessments required that an impact assessment plan be developed as the first task of the work.

The overly comprehensive set of issues meant that the limited resources had to be spread too thin on issues that varied in importance. This had several consequences:

- . some of the issues did not receive any attention;
- . many issues were superficially covered; and
- . little analysis was conducted.

1.3 Lack of Contingency Plans for Implementation Problems

The difficulties of implementing new programs in the field and the implications of this for evaluation is well known. The book titled Implementation by Pressman and Wildavsky focussed attention on the problems of moving from a policy or program decision to operations in the field.¹ Subsequently there have been numerous writings that described case studies of implementation problems and explanations for their occurrence.²

The linkage between program implementation difficulties and the built-in research for experiments has been recognized in these writings. Williams presents the major challenge of determining whether programs are working well enough to provide a valid basis for testing the experimental hypothesis.³

¹Geoffrey Pressman and Daron Wildavsky, Implementation (New York: Basic Books, 1971).

²Edited books which include several case studies include: Walter Williams and Richard F. Elmore, Social Program Implementation (New York: Academic Press, 1976) and Mary Ann Scheirer, Program Implementation (Beverly Hills: Sage Publications, 1981).

³Walter Williams, "Introduction," Social Program Implementation, p.6.

The problems of program implementation and their relationship to evaluation studies were addressed in the writings on evaluability assessments - a front-end planning exercise which considers the readiness of a program for an effectiveness evaluation.⁴ OCS program officials were briefed about using the evaluability assessment procedure for planning the impact assessment studies. In fact, it was a built-in feature of the first impact assessment of the field trial at Energy, Mines and Resources.

The planning of an evaluation should include contingency plans that take implementation problems into account. This includes provisions for assessing the readiness of the program for an impact assessment before launching such a study. However, neither the Department's Terms of Reference nor the consulting firm's plans had contingency according to the readiness of the technology in the field trials.

The formal terms of reference were not amended in light of the realities experienced by the field trials. Ad hoc adjustments to the focus and approach were made during the course of the studies. The consequences were:

- . Inappropriate attempts were made to measure and account for impacts when there was either no product or an unstable product. One impact assessment was completed before the field trial was fully developed.
- . The focus of the assessments shifted in varying degrees to implementation issues but there was no approved framework and approach for such a study. While informal reporting occurred, there was no formal documentation of revised impact assessment plans and no formal approval.
- . The appropriateness of the substantial budgets for the changed focus of the impact assessments is difficult to determine. Although the focus of impact assessments changed, there was no formal review of the budgets required to complete the work.
- . There is little in common among the studies to synthesize for purposes of drawing general conclusions. The

⁴Writings on evaluability assessment include: Leonard Rutman, Planning Useful Evaluations: Evaluability Assessment (Beverly Hills: Sage Publications, 1980), Richard E. Schmidt et al, Evaluability Assessment (Rockville), Md.: Project SHARE, DHEW No. 05-76-730, 1979), Joseph S. Wholey, Evaluation: Promise and Performance (Washington, D.C. The Urban Institute, 1979).

assessments varied in the measurement techniques and approaches used.

The quality and usefulness of information collected in the impact assessments was affected by the lack of contingency plans and planned decision points. In one field trial the impact assessment was completed before the system was fully operational. In fact, the report states that the study can be viewed as a baseline study for an impact assessment once the system is operational. Clearly this does not meet the initial objectives of the impact assessment. In another, negative first experiences with systems which were introduced prematurely may have had continuing impacts on some users who were "turned off" to the systems. These effects would have been avoided by the establishment of minimal system performance criteria to be met before introducing the technology in the workplace and minimal implementation criteria to be met before conducting the impact assessments.

1.4 Contractors responsible for analysis of host and vendor data

The contractor was dependent on the vendor to provide systems data and was to be held responsible for the analysis of this data. The Site Impact Assessment Committee (SIAT) was responsible for the coordination of this data collection. Without control over the design and collection of this data, contractors would not be able to develop detailed plans for integrating the collection and analysis of systems data with their planned approach for the impact assessment. In one field trial, although an online procedure for the recording of user problems was provided, little mention was made of this data in later reports.

2. PLANS

The second area of review, concerns the plans for the conduct of the impact assessments. The consulting firms prepared formal proposals that presented their plans for implementing the requirements in the Request for Proposals. Consulting firms could not be expected to recognize the particular implementation problems of the field trials. Moreover, the firms proposed to address the identified issues in the RFP to at least be responsive to the requirements. We took these considerations into account. The findings

regarding the assessment plans address themes similar to those raised concerning the Requests for Proposals. Issues concerning the impact assessment plans are presented below.

2.1 Failure to limit the number of issues

We already indicated that the Request for Proposal identified 24 complex issues. Consulting firms did have some flexibility to exclude some issues and place varying amounts of emphasis on them. This opportunity was inferred from the following statement in the Request for Proposal: "These concerns are presented here to clarify the nature of the impact assessment so that appropriate expertise may be assembled by prospective contractors. The concerns are neither exhaustive nor prescriptive and proposals are not expected to address them in full detail." However, in the bidders conference clarification on this point indicated that all issues should be covered. This shifted the onus to one of priority setting among the many issues from one selecting issues for inclusion/exclusion.

Rather than narrow the list by concentrating on those issues and particular dimensions that were most directly related to the particular field trial, there was an attempt to address all of the issues. In fact, the plans promised to address all the issues through multiple data collection methods. Some of the impact assessments plans provided large matrices to illustrate how each issue would be addressed. For example, one plan provided for combining twelve measurement activities with each of nine measurement periods to cover the issues listed in the Request for Proposal, thus producing 35 issues in all.

In order to cover the large number of issues with the resources available, little effort could be spent on the development of appropriate measurement tools during the assessment. Thus extant instruments or subscales of instruments were usually used. These instruments phrased questions at a generic level, tending to refer to computers in general rather than to the specific features, issues and organizational context of the field trial. There was also a tendency in some plans to rely on inappropriate measurement



approaches to address issues for which standardized scales or measures were not available. For example, in one trial the health impacts of the system were assessed based on subjective opinion ratings.

Another result of the attempt to address all of the issues was a lack of attention to the reliability and validity of the measures used. Measures used should be both reliable (i.e. yield stable measures) and valid (i.e. measure what they are intended to measure). One impact assessment plan stated an intention to assess the reliability and validity of measures through a multi-trait, multi-method technique is stated, but there is no evidence that this was ever applied. This is not surprising since this approach would be complex and difficult to apply given the number of issues examined.

In summary, a shortcoming of the terms of reference, i.e. inclusion of too many issues, was not resolved at this stage. The major consequences include those noted above, and consequences presented when we discussed the overly comprehensive terms of reference.

2.2 Plans did not adequately address the realities of the field trials

The contractor's plans generally did not take into account the program implementation problems that the impact assessments would face. The fact that there had been some delay in the field trials was known to the contractors when they submitted their proposals. Presumably they felt that the trials would get back on track to permit implementation of the proposed approach. Only one of the plans recognized that it would likely be measuring the "turbulence of implementation" and an approach was outlined to address this dimension.

The failure of the plans to address the realities of the field trials meant that considerable resources were devoted to the attempt of measuring impacts of undeveloped and unstable products. There were also ad hoc adjustments to examine implementation issues which were neither formally planned nor approved by the Impact Assessment Committee responsible for overseeing the evaluations.



3.0 APPROACH

The approach actually implemented for the impact assessments was substantially changed from what was included in the original proposal response to the Request for Proposals. The focus and approach differed greatly among each of the impact assessments, reflecting different interpretations of the broad terms of reference and adjustments to the problems with the field trials. It is difficult to assess the approaches because the original objectives for the impact assessments were not pursued in practice and there were not revised objectives and plans for the changed thrust of the research.

3.1 The emphasis on measuring summative impacts was unwarranted

The measurement of summative impacts seemed to reflect a primary concern about meeting the requirements of the original terms of reference. One of the contractors for the impact assessments who planned to examine the implementation process made the following statement about its impact measurement activities: "The other instruments are being implemented in the design in order to at least attempt to measure issues posed in the terms of reference." The limited potential usefulness of the summative findings from the impact assessments was obvious for many reasons, including: 1) the implementation problems of the field trials; 2) difficulties in obtaining true "before" and "after" measures; and 3) inadequate control/comparison groups as other research designs that facilitate cause-and-effect analysis. Yet this was pursued with already mentioned changes.

3.2 The modified approaches to address implementation issues were not formally planned for and approved

The shift to examining the implementation process was appropriate. However, the contractors appeared to make ad hoc adjustments rather than plan such studies on defined issues pertaining to the introduction of office automation in an organization. This meant that the approach of these studies were not related to a clearly defined objective and focus. In one assessment the shift



was to a participant observation approach which produced a descriptive history of the field trial but provided little analysis relative to impacts and issues identified in the assessment plan. Whether or not these studies will collectively produce useful information about implementation is difficult to determine. The lack of formally planned and approved implementation studies implies little assurance of their usefulness.

3.3 Failure to provide a mechanism for formative feedback

Formative evaluation was stated as a purpose of the impact assessments. Formative research is intended to provide feedback on the issues of concern and problems encountered in a project so that these might be corrected and the program improved. As the vendors were most directly responsible for the field trials, issues of importance to them should be addressed in a formative evaluation. This would require changes in approach. First, it could potentially require a change in the nature and format of data collection -- focussing on fewer users in greater depth. Second, a clear mechanism for feedback to those with immediate responsibility for the field trial is required if this process is to be effective. None of the impact assessment plans indicated the types of information on which feedback should be provided or mechanism for providing this feedback.

The consequence of this lack of formal structure limited the formative feedback provided to the vendors or host departments. The formative aspects of the impact assessments became descriptive studies of implementation rather than formative evaluations.

LESSONS LEARNED

There are many lessons that can be learned from the impact assessment component of the OCS Program for future field trials. We present those most closely related to the findings discussed above.



1. Impact assessments must be planned and managed to take into account the specific nature of the product and its readiness for implementation in the field.
 - Formative research should be expected for developmental trials and summative research for product applications.
 - Performance criteria to assess the readiness of the product would be developed and used to establish the appropriateness of conducting an impact assessment.
 - The launching of an impact assessment concerned with effectiveness measurement should be based on the following preconditions: 1) the product is fully developed; 2) it is being implemented as intended, 3) the impacts are well-defined; and 4) the relevance of the impacts to the technology is established.
 - The time frame for the impact assessment should be sufficient (at least 1 year of implementation prior to the "after measures"), to assess impacts.
2. Terms of Reference should have a built-in contingency plan.

The common difficulties of implementing new programs and the problems this creates for impact assessment should be taken into account through contingency plans. This would provide the opportunity to review and change the impact assessment's to suit the "realities" of the field trials.

3. The scope of impact assessment should be limited to help ensure valid and reliable measurement within the constraints of time and available budget.

To examine 24 complex issues which are viewed differently by the 5 identified users was considered somewhat overly ambitious for an impact



assessment that is concerned with measuring and accounting for changes produced by the technologies. Such an impact assessment was the initial objective but it was not actually pursued. Yet the contractors attempted to address as many of these issues as possible in a relatively superficial manner. A more limited scope would help ensure that the most important issues are properly examined.

4. The nature of the issues should be clarified before measurements are selected and/or developed.

The nature of the issues and their dimensions were not clarified in either the Terms of Reference nor the contractors' plans. This meant that there was little basis to assess the appropriateness of the measures to the objectives of the impact assessments and to the specific nature of the field trials.

5. More coordination is required among the impact assessments.

We already indicated that the impact assessments were carried out in three waves. For each wave there were different departmental people managing the assessments. The experiences with the first impact assessment of Energy, Mines and Resources (e.g., implementation problems of the field trials, shifting orientation of the research from impacts to process, and the difficulties of addressing the large number of issues) were not capitalized in planning of the following three impacts assessments. Similarly, the final impact assessment was not planned to overcome the problems encountered in the previous efforts. In fact, essentially the same terms of reference were used for all impact assessments.

There was little coordination in regard to the methodology for the impact assessments, resulting in major differences in approaches used and types of findings produced. For example, one assessment used mainly objective measures while another concentrated on subjective measures. Impacts measured in some studies were excluded in others, preventing crosstrial



comparisons. The manner in which common impacts were measured varied among studies. However these were not selected to cover a given range of approaches. There may be justifiable reasons for these differences but these do not appear be planned.



REVIEW QUESTIONS



DEPARTMENT OF COMMUNICATIONSINTERVIEW GUIDEIMPLEMENTATION ANALYSIS - OCS PROGRAMA. RELATIONSHIP OF PROGRAM STRATEGY TO OBJECTIVES

- A1 What, in your opinion, are the objectives of the OCS Program? Are these objectives appropriate for a program in DOC?
- A2 What is your understanding of the OCS Program objective "to develop an industrial capability in Canada for an integrated electronic office system"?
- A3 Did the objectives, in your opinion, for the Program change over time? How?
- A4 To what extent was there a need to have several companies involved in the same trial to address the concern that: "The fragmentation of production and services among a number of firms means that the equipment and services produced by them will be incompatible and difficult to integrate into a system. No one Canadian company has the size, resources and expertise to conceive, develop and produce a system in this country comprising several products and services to meet user needs." (T.B., 1980)
- A5 What was the rationale for multiple trials with different companies? Implications for development of integrated systems?
- A6 Was the Program initially meant to be an application or a developmental trial? Did a shift occur from application to development? Why? (Note: T.B., 1980 said that OCS will support "more advanced and completely integrated systems.")



A7 Phase I was to include "one or more contracts with industry to develop proposed functional specifications for an integrated office of the future system (i.e., describing what a piece of equipment or system should do, but not how it is to be done)." (T.B., 1980)

- . Was this to serve as the plan or framework for selecting or designing field trials? (see q. C1)
- . Do you feel that proposed functional specifications were developed in phase I?
- . Why isn't there reference to the accomplishments or failures in developing such specifications in discussions of Phase I achievements in T.B. submission of 1982?
- . Implications of not having such specifications (e.g., trials are defined by vendors and departments, not the OCS Program)?

A8 Do you think the field trials were the best way to achieve the OCS Program's objectives? Why or why not? What other alternatives are possible? (as stated in q. 1).

B. COMPATIBILITY OF GOALS AMONG STAKEHOLDERS

B1 What were the goals of the stakeholders (DOC, vendors, and host departments)?

B2 Did the goals change over time? How?

B3 To what extent were their goals in conflict?

B4 Did conflicting goals among stakeholders affect program implementation?

C. INVOLVEMENT OF ITC

C1 Reference is often made to the cooperation of Industry Trade and Commerce. Also, a condition for the second phase was that: "companies in the industry approach ITC for EDP support to develop specific pieces of equipment within the systems concepts defined in the first phase (T.B., 1980)



There were anticipated expenditures of \$32 million through existing ITC cost-shared expenditures.

- . What were the formal arrangements with ITC for the Program?
- . Why didn't the participating vendors receive support?
- . Implications of not receiving support?

D. ACTIVITIES NOT IMPLEMENTED

D1 Were there particular activities identified in the Treasury Board submissions which were not implemented at all? Reasons? (Include development of functional specifications and cooperation with ITC, Probe leading edge research)

E. IMPLEMENTATION PROBLEMS

E1 Was there a plan which outlines the implementation process for the field trials?

E2 To what extent were the field trials implemented as planned? What were the departures from plans? (Delay is a major departure.)

E3 What accounted for the implementation problems of the field trials? Probe factors below:

- . Program design - sunset provision, program activities.
- . Management issues - included e.g., staffing problems (account for 5 month delay in Phase I - T.B., 1980).
- . Funding from DOC.
- . Environmental factors - changes in the economy, technological developments, concerns of interest groups.
- . Problems with the vendors - e.g., financial instability.
- . Role of DSS.



- . Host Departments - staff turnover, unwillingness to accept the technology, etc.
- . Role of OCS Program - i.e., consultation.

- E4 What were the consequences of the implementation problems for the field trials? Probe:
- . quality of the trial;
 - . acceptability by host department; and
 - . cooperation and support of vendors.
- E5 To what extent did the technologies implemented in the field trial reflect what was outlined in the Memoranda of Understanding and in the DSS contract?
- E6 Repeat questions 1 to 4 for the impact assessment activity?
(Probe E3 when did you become aware of the need for impact assessment? Why was the impact assessment initiated after field trial activity had begun? How was the budget determined and why was it revised?)
- E7 Repeat questions 1 to 4 for the public information activity?
- E8 Repeat questions 1 to 4 for the behavioural and other research activity?
- F. COST TO HOST DEPARTMENTS
- F1 What was the cost of the field trials to the host Department (not including DOC funds)?
- F2 To what extent did the cost to the host department exceed their estimated cost?
- F3 What accounted for the extra costs?



G. COST TO VENDORS

- G1 What was the cost of the field trials to the vendors (not including funding from DOC through host departments)?
- G2 To what extent did the costs of the vendor exceed their estimated costs?
- G3 What accounted for the extra cost?

H. FULL-SCALE IMPLEMENTATION IN HOST DEPARTMENTS

- H1 What are the prospects of full-scale implementation of the technology tested by the host department? Why?
- H2 Have funds been sought and obtained by the departments for operational phase?

I. ORGANIZATION

- I1 Did the organizational structure for the OCS Program significantly affect program implementation?
- I2 Were there particular changes in organizational structure which had specific influence on program implementation?
- I3 To what extent did the committees (such as OCS Users Group, Industry Consultative Committee, and Impact Assessment Committee) influence the selection of the field trial strategy and the identification of objectives? Did the committees influence the implementation process? Elaborate.
- I4 Why was the impact assessment activity moved under the manager of the OCS Program? Implications?



