The Design and Evaluation of a Public Access Computer-Based Application for Unemployment Insurance Benefits

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ABSTRACT

The Design and Evaluation of a Public Access Computer-Based Application for Unemployment Insurance Benefits

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A computer program was created to allow claimants to apply for Unemployment Insurance benefits without filling out paper forms. A touch-sensitive machine-user interface was employed in order to facilitate data entry. The goals of the system were: (a) to capture complete and accurate data directly from the claimants, store it and make it available to calculation agents; (b) to provide claimants with a user-friendly alternative to the traditional paper-based method of data gathering; and (c) to decrease human intervention and human error by eliminating the clerk's task of data entering written information.

An expert review and a one-to-one evaluation of the program were carried out during the developmental phase. As well, a small-group evaluation with 11 subjects was conducted in order to determine whether the program captured complete and accurate information and to assess user attitudes towards the system. Examination of the print-outs of the applications indicated a need for minor technical revisions to the program. Analysis of the responses to the attitude questionnaire suggested, overall, a favourable attitude towards using this program, but a need for additional on-line help.

DEDICATION

In memory of Barney, my beloved dog who was there for me from high school through graduate school and who passed away three days after my thesis defense.

The joy of learning is surpassed by the joy of loving. Good-bye, Boo Boo.

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CHAPTER I

INTRODUCTION

The Unemployment Insurance (UI) program provides temporary income protection to unemployed workers. The program was first implemented 46 years ago. It is a vital component of the Canadian economy and has the potential to touch almost every Canadian.

The Canada Employment Centres (CECs) which are the local offices of Employment and Immigration Canada, are the primary point for service to clients of the UI program. In 1987, CECs handled 3.2 million claims for UI (see Appendix A) and CEC staff answered 24 million enquiries from the public. Regional Computer Centres issued 30 million benefit warrants worth some 10.4 billion dollars (CEIC Annual Report, 1988). The CECs presently operate without the office automation which is becoming universal in the private sector and in many aspects of government. Bringing the microcomputer and office automation to the CEC will affect benefit payments as well as control functions. These clerical-intensive control functions are mostly concerned with the kind of record keeping that would be best supported by local microcomputers with mainframe access (CEIC Report, 1988). Employment and Immigration Canada is faced with the challenge of meeting the technological demands and requirements of its employees and its clients.

1.1 Applying for UI Benefits

Applying for UI Benefits is primarily a self-directed process (see Figure 1). A claimant typically enters a CEC and completes an Application for Benefits form. Depending on the individual case, the claimant may also be required to fill out one or more supplementary questionnaires. Once the questionnaires are completed and signed by the claimant, he/she may leave the CEC. A Data Entry Clerk then copies the necessary information into a computer program called the Support System for Agents (SSA). Later, an Agent I calls up the claimant's social insurance number (SIN) in SSA and reviews the screens containing that person's information. Unlike clerks, agents possess some decision-making power and may alter the information. Fact-finding may be necessary when there are inconsistencies or missing data elements. The agent may contact the claimant, a previous employer or other person(s) for additional information regarding the claim. Contentious issues are reviewed by the Agent II. Once the data are deemed accurate and complete and the Agent I determines that the claimant qualifies for benefits, the transaction is sent to an on-line system (OLIS) which maintains a record of the transaction. This record is then forwarded to Benefits and Overpayments (BNOP) which issues a cheque to the claimant.

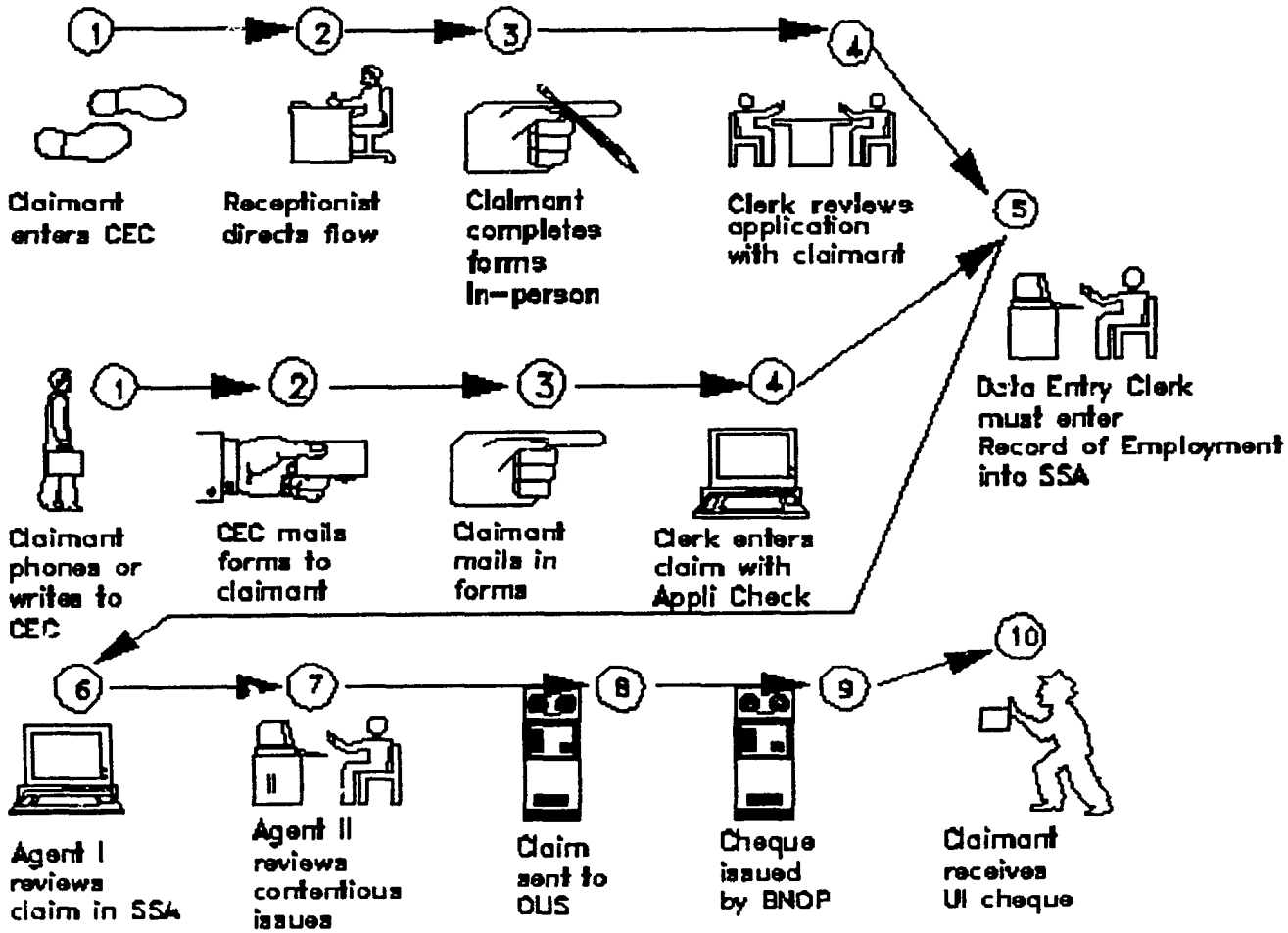


Figure 1. Operations involved in the paper-based application for UI benefits

1.2 Problem Statement

The primary goal of claims-taking is the completion and accuracy of information. Approximately 3.3 million initial and renewal claims for benefits were processed in Canada between April 1986 and March 1987. Of these, 2,542,593 or 75% were filed in-person (as opposed to mailed-in). It was found that approximately 14% of the main form, the Application for Benefits, contained some omission and/or inconsistency, resulting either directly or indirectly in some 12 million dollars in identified overpayments and some four million dollars in identified underpayments to claimants. Clearly, the present claims-taking system possesses a weak link.

"Omissions and inaccuracies in formative lead-gathering can and do cause unnecessary delays in the claims processing cycle, given the additional effort required in their subsequent identification and resolution" (Ralph, 1987).

The objectives of this thesis-equivalent are: to determine whether a computer system is perceived by the general public as an acceptable alternative to the traditional, paper-based application for UI; to create a machine-user interface which facilitates data entry for a diverse population; and to determine whether the program can capture and store complete and accurate claimant files which can be accessed and manipulated by calculation agents.

1.3 Rationale for a Computer-Based Approach

In order to improve the quality of information which enters the application process at the front-end, an automated version of the existing application form and supplementary questionnaires was proposed. This system would offer claimants the choice of directly entering their claim.

Self-service technologies, such as automated teller machines (ATMs) and on-line library catalogues, have penetrated the social realm and been accepted by various subgroups of their target populations (eg. Mears, McCarty & Osborn, 1978; Lawrence, 1983; "What Role," 1988). Based on this premise, it was suggested that claimants would be willing to enter their claim at a terminal which offered a user-friendly, non-threatening interface, particularly if they were aware that it was more convenient and efficient to apply with the computer than with the traditional paper-based method.

"Appli Touch" is the name prescribed for an automated service aimed at the unemployed seeking benefits. This population is massive, as any Canadian who contributes to the UI program may become eligible.

The rationale for developing this self-directed system, was two-fold:

- More accurate and complete data could be achieved

with a system which prompts the claimant, identifies non-valid data entries, provides examples, and automatically presents the appropriate supplementary questionnaires based on answers to key fields;

- Overpayments and underpayments resulting from human error would decrease because the clerk's data entry task, which involves manual information transfer, would be modified.

In the new process of applying for Unemployment Insurance Benefits, the claimant would respond to the questions presented by Appli Touch, via a combination of keyboarding and directly touching the touch-sensitive screen. Upon completion of the application, the system would direct the claimant to the front desk. At this point, the file would be saved. The clerk would enter the claimant's SIN into a menu-driven program called Appli Check. All of the data elements from the Appli Touch file would be transferred to Appli Check in a different format and interface. Appli Check allows the clerk to review the claim screen by screen and make corrections. The system automatically highlights fields which contain non-valid or missing data elements. Because the claimant is at the front desk, the clerk has direct access to information, which will greatly decrease the amount of time later spent by the Agent

on the follow-up fact-finding.

Once the claim is checked with Appli Check, the clerk prints out a copy and the claimant signs and may leave the CEC. The modified claim is saved and returned to the Appli Touch file. Later, an Agent I can enter the SIN in SSA and download the file. Appli Touch and SSA have 40 common fields. These fields are filled by the data which had been entered by the claimant then checked by the clerk. Thus, by the time the data is sent to SSA, it has already been reviewed with the claimant. The procedure then continues in the usual manner. The Agent I reviews these and other fields which comprise SSA, does any necessary fact-finding, then calculates the claim and sends the transaction to OLIS. (For a diagram of the computer-based application procedure, see Figure 2.)

Appli Touch is but one component in the automation of the CEC. Together with Appli Check, SSA, OLIS, electronic letter-writing, on-line manuals and regional mainframes, the paper-burden will decrease, service to clients will be quicker and more efficient and millions of dollars are expected to be saved due to the securing of complete and more reliable information earlier on in the claims processing cycle. Appli Touch and these other systems are being developed for implementation in CECs nation-wide.

The role of the educational technologist is evolving as rapidly as the computer industry. The knowledge and skills

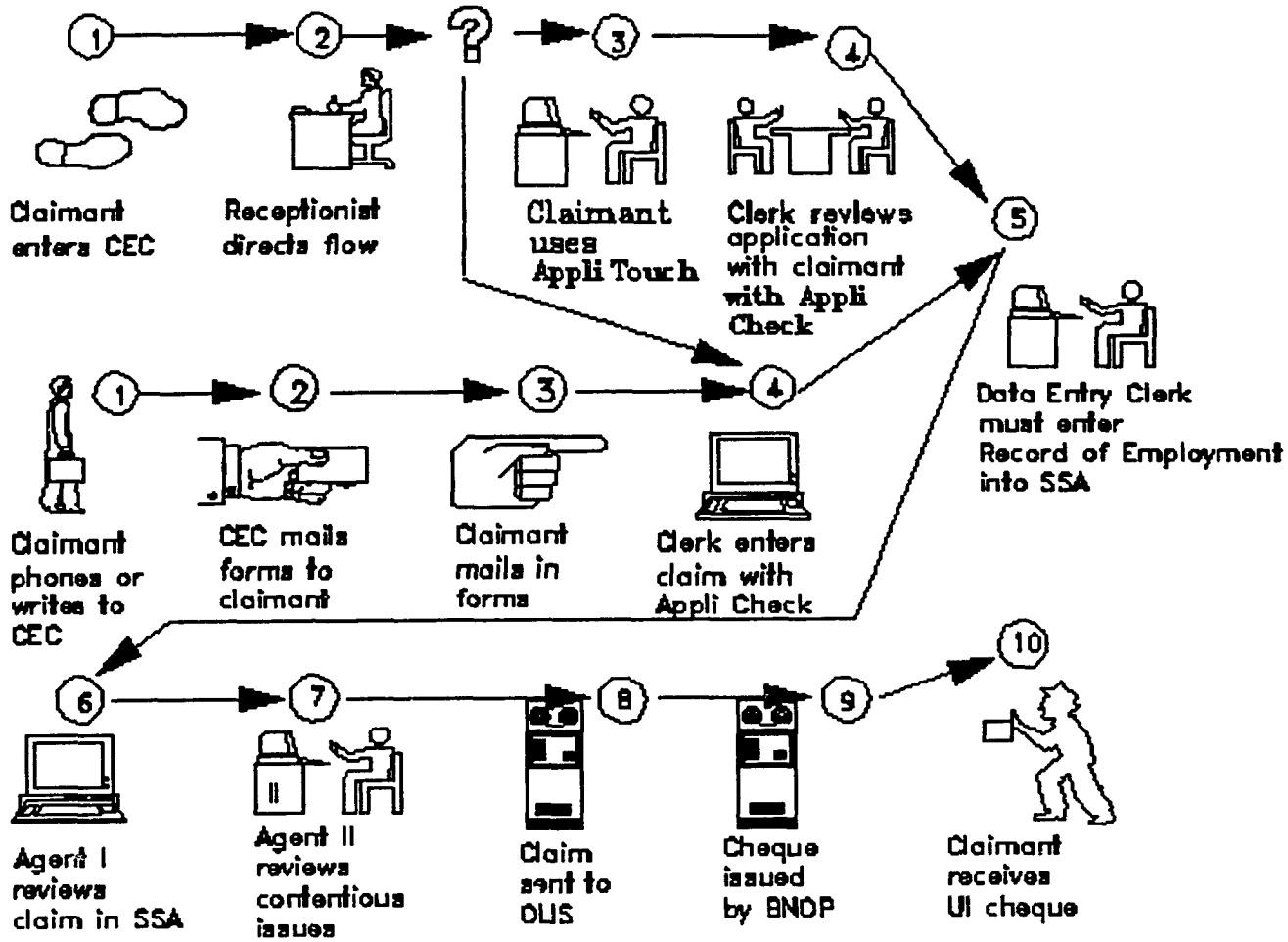


Figure 2. Operations involved in the computer-based application for UI benefits

necessary for the development of effective computer-based training are increasingly being applied to the creation of computer-based services. Well-designed computer-based services are self-explanatory programs which guide or coach the user through a series of screens in order to provide a desired outcome. Therefore, there is little or no need for training the users, despite the fact that the majority of them have little or no previous experience interacting with a computer (except perhaps with ATMs or on-line library catalogues). Clearly, the field of educational technology will continue to expand and overlap with other fields, such as computer science, as development teams recognize that the expertise possessed by the educational technologist is essential in the competitive market of software design.

CHAPTER II

LITERATURE REVIEW

2.1 Goals of a System

A machine-user interface must achieve several objectives in order to be considered user-friendly. Berger and Klenperer (1981) outline four goals for on-line catalogues. These goals can be applied to any public access system.

- The system must be able to accommodate users who possess varying degrees of experience with computers, with the particular system and with the type of service offered.
- The system must be easy to learn and self-explanatory.
- The system must treat the user as a human being and not assume that users possess the same degree of computer literacy. It must minimize frustration and alienation.
- The system must provide the user with a logical progression of questions, an opportunity for correction and positive, non-threatening feedback and help. The user must be made to feel as if he/she is in control, even though the system is actually guiding the user.

2.2 Public Acceptance of New Technologies

In-person claims-taking is a requirement of the Employment and Immigration Commission. Filling out forms is a task which takes time, especially since the quality of information retrieved is essential for the accurate determination of eligibility, entitlement and qualifying period. Would claimants, particularly the majority of whom have little or no experience with computers, be willing to make an application on their own with a computer?

Prior to the penetration of automated teller machines (ATMs) into the communities, the public had access to and acceptance of such technologies as vending machines, automatic bill changers and pay telephones. ATMs are a more sophisticated means of automating services.

User reaction to new technologies is generally positive when the user perceives the technology as a helpful means of improving service. Consumer reaction to technology cannot be isolated from reaction to the service that goes with the technology. For example, customer reaction to ATMs has been generally positive, for such technology offers service independent of traditional banking hours (Kirchner, 1984). Clients have access to their money at any time and at many locations. The systems are relatively easy to use and waiting in line for service is greatly reduced, especially when more than one ATM is installed at a given site. A

computer-based service can "overthrow the twin tyrannies of place and time" (Mitchell, unpublished statement cited in Kirchner, 1984, p. 120).

Technologies have "life cycles" (Flynn, 1988) which characterize the phases of development of a particular product. Typically, research and development are followed by rapid progress and growth during which time the product is improved through experimentation. As scale economies result in reduced costs, demand for the product increases and new markets develop. The next phase of the life cycle is that of maturity. The demand continues but at a slower pace. Finally, sales level off or fall as consumer demands shift to a newer product. The development of a life cycle for any product is based on the nature of the product, the rate of technological change and the rate of market acceptance.

The tremendous growth in the number of home computers in the last ten years should mean that users of such technologies will be more accepting of new technologies with which they come into contact in banks, libraries or Canada Employment Centres.

2.2.1 Reactions of Population Segments

With most new technologies, public acceptance comes in stages. Numerous studies have indicated that various sub-

groups of the population at which a particular service is aimed are more likely than other subgroups to accept the innovation. Market research of ATMs in Belgium, for example, has shown that users are predominantly young (85 % between 20 and 40 years of age) (Conseil de Consommation, cited in Kirchner, 1984).

A 1976 British library study conducted by Holmes (cited in Hall, 1977) indicated that 22 % of a sample of users of the on-line retrieval system were under 24 years of age, 70 % were between 25 and 44 and only 8 % were over 45.

While studying user reactions to ATMs, Levy and Greene (1972) found that young people and the professional / managerial class are among the first to accept technological changes. Blue-collar workers and the elderly are among the last, and require persuasion and education. Mature and older people tend to be the most opposed to automation. Lawrence (1983) studied ATM users and found that they are different from the average user of traditional banking services. ATM users tend to be younger, better educated, and more affluent than average. She noted a significant sex difference, with more men than women using ATMs. Hood (1979) also examined users of ATMs versus users of traditional banking services, and found that men are more likely to use ATMs. He found that the typical use of ATMs was young, middle-class, male and Caucasian.

While the number of ATMs and cardholders has

significantly increased over the last decade, there has been little change in the number of uses per card ("What Role," 1988). Poor marketing may be one reason why only a third of ATM cardholders use the device regularly. Two challenges will be to increase cardholders' usage, and to convert traditional banking customers to ATM users.

2.2.2 Reasons for System Acceptance or Rejection

Levy and Greene (1972) found that the most common reasons for objecting to innovations include: desire to conserve existing ways of doing things; difficulty of learning new methods; perceived "artificiality" of new methods; unanticipated hazards of doing things a new way; the ugliness of the unfamiliar; increased costs; viewing gadgetry as childish; technology viewed as antagonistic to nature; loss of human skills; interference with interpersonal relationships.

Many of these sources of objection are rooted in misunderstanding and fear. Levy and Greene also identified several main themes for supporting machines: pleasure in novelty; their necessity for survival; viewing the familiar as old-fashioned; automation viewed as efficient in time, cost, capacity and relative infallibility; belief that automation is progress; viewing machines as freeing people for a higher quality of

life; and reverence for science, among others.

While those in favour of, and those against the automation of public services may possess different philosophies, one thing is certain -- there will always be some people who are opposed to innovation, whether it be using a computer, flying in an airplane or using a VCR to record or watch a movie. Once one learns how to operate a new technology, whether it is out of curiosity, or necessity, much of the initial fears subside as the user develops a cognitive model or understanding of the system. As users gain experience with a given technology, their attitude towards it often changes. Good experiences lead to more positive attitudes and bad experiences lead to negative attitudes.

Schneiderman (1980) states that one's attitude towards a user-machine interface affects his/her learning and performance, and ultimately determines whether he/she will accept or reject the system.

Performance with a new system may be affected by user anxiety, fear of destroying the machine or more likely, the files, fear of being watched and making mistakes, and fear of responding too slowly. New users place fewer demands on the system and are more willing to follow a predetermined route or sequence of questions, while increases in experience lead to a better understanding and more developed cognitive map of the internal logic of the system

(Schneiderman, 1980).

Mears et al. (1978) conducted a study in order to identify consumers' perceptions of bank machines and evaluate the trade-offs between the reduction in traditional personal interactions with bank employees and the convenience offered by ATMs. Three-hundred randomly selected home interviews were conducted in 1976. Subjects for the most part expressed negative attitudes towards ATMs which suggested that a personalized relationship with a teller may be more valued than increased convenience of machines. The study indicated that ATMs were viewed as an acceptable alternative to waiting in long lines. It must be kept in mind, however, that this particular study was conducted thirteen years ago, which is archaic as far as computer technology is concerned. Yet, many of these apprehensions remain despite the leaps in technological developments which have taken place in the last decade. More recently, 150 users of Royal Bank account updater were interviewed (Royal Bank, 1987) and the main feature which these customers liked was the speed of service (mentioned by 53%). In general, it appears that even those people who are opposed to using computer-based services are willing to use them when the resulting services are more efficient and convenient.

2.2.3 Individual Differences and the Conceptual Model

One point which must be stressed is that for any computer-based system, users' skills and knowledge vary greatly. According to Reynolds (1985), "Considerable diversity exists among users in their level of knowledge about library catalogues and in the extent to which they are familiar with the use of computerized systems" (p. 430). A well-designed system may counterbalance the diversity.

The conceptual model which the user develops need not mirror the actual behaviour of the system, which can be very complex. Rather, this model is a myth that explains that the computer is similar to other things with which the user is already familiar (Rubinstein and Hersh, 1984). The model does not need to be explained to the user; rather, it is formed based on one's experience with the system. If the actual model of the system lacks consistency then the user's model of the system will be inconsistent and the system will be perceived as difficult to use.

Keyboard aversion (Kollin & Shea, 1986) is typically thought of as a phenomenon experienced by corporate managers who regard clerical skills as demeaning. Such users would probably feel more comfortable with a menu-driven system. However, keyboard aversion may also be experienced by people who have little or no direct exposure to technology. The move from passive linear systems to interactive systems is a

recent trend. Keyboard aversion is a factor which may slow the adoption of active systems. Touch-screen technology may resolve this problem. The combination of touching the screen and typing reduces the number of keystrokes needed, thereby facilitating the data entry process and reducing the threat to one's self-esteem which may result from feelings of inadequacy.

Several studies have shown that a user's response time increases as the system's response time increases. Mental efficiency decreases when the system delay exceeds a certain period of time. The length of this interval is dependant upon the task. Users tend to employ fewer commands and take longer to respond as a function of increasing system response time (Leiker, 1982).

Variability among the system's response times leads to user frustration and a drop in productivity. A consistent delay must occur so that the user can build this expectation into his/her conceptual model of the system. A delay which is too short (i.e. .5 seconds) has a negative impact as well (Leiker, 1982).

The user should be permitted to complete his/her input before the system responds. Answer judging or field verification may occur during the data entry process. However, the presentation of an error message prior to completion of the task prevents closure -- the sense of having completed the task. A delay which exceeds user

expectations causes memory deterioration, prevents closure and results in anxiety (Martin, 1973).

The system design and its features may have a strong impact the ability of users to construct a conceptual model of the system which in turn will affect their attitudes towards this system.

2.3 Formative Evaluation of Software

Formative evaluation of software yields data which, when used as a basis for modification, result in a program that is more effective and attractive. Each hour of computer-based training may take up to two-hundred hours of development time, depending on the nature and complexity of the program (Merill, 1986). Similarly, computer-based services require a great amount of development time. It is logical then, that considerable attention be given to the evaluation of the software, in order to validate its design, presentation format, content, structure and technical aspects.

Two types of indicators are typically measured in order to assess a system. One is the effectiveness of the system in satisfying the users' needs and the other is attitudinal feedback from users. Often, users' reactions may be influenced when innovative technology is employed and their feedback may reflect the novelty rather than the actual

performance of the system (Tagliacozzo, 1986). One must be careful not to rely solely on a single rating scale to assess the value that a system has for its users. A questionnaire, notes Tagliacozzo, should not only ask for global judgements but it should tap several aspects of the users' reactions to the system.

While expert review provides valuable feedback, particularly with respect to content, it cannot accurately predict the target users' difficulties with the system (Weston, 1986). Any design approach must prove its value through user acceptance. It is only by testing the machine-human interface with real users that one can assess the quality of the product prior to its release (Rubinstein & Hersh, 1984).

A more in-depth approach to evaluation is required. Dick and Carey's (1978) three-tier model of formative evaluation provides a framework for assessing the product. According to Dick and Carey, the first phase or "one-to-one" evaluation is conducted in order to "identify and remove the most obvious errors in the instruction, and to obtain initial reactions to the content from learners" (p. 199).

Inconsistent design philosophy may create expectations in the user which cannot be fulfilled. One-to-one testing of various system features will bring to light user difficulties. By involving end users early on in the development, the designer can identify their wants, needs

and expectations. The product must be viewed "not from the technology 'out' but from over the user's shoulder 'in' " (Haselkorn, 1988, p. 8).

Usability testing has an impact on design issues. As these issues are reviewed with users, there will be less need for explicit on-line help. Help can be integrated into the interface design so that the system becomes increasingly self-explanatory.

Specifications of a machine-user interface is as important as hardware and software specifications. Programs must be developed through prototypes and tested before the first version is completed. This approach to evaluation may be applied to software of any nature. It is very difficult to substantially increase usability of a product once it has reached the final draft.

The prototype allows users to view a portion of the program and all of its external elements actually running on a computer rather than simply examining flowcharts (Grottola, 1989). Another view is that a prototype serves a dual purpose: it gets the end users actively involved and simulates a portion of what they will need to do in using the completed system; it helps the user and design team think of all the issues and fine points of design (Podorowsky, 1988). Usability is not tested out of moral concern for the end users; rather, the goal of usability testing is profit. As speed and ease of use increase, users

can perform their tasks more efficiently and profits increase as a result.

While one-to-one testing is best conducted with a prototype which contains the design features of the system, field trials are conducted with the first draft of the program, thereby providing a more comprehensive and detailed type of feedback. Because field testing utilizes a larger sample of the target population (approximately 40 people), design and technical limitations may be indicated, and a clearer indication of the suitability of the software in meeting specialized user needs may come to light. Field testing is appropriate in the actual setting, if possible, or in a realistic simulation of the target setting. The program should be field tested under conditions which approximate or mimic the conditions of the target setting.

2.4 Guidelines for Screen Design

Computer graphics are an important component of any program for they can enhance the content, provide a motivational source for the user and present information in a cohesive and meaningful manner. Computer graphics can facilitate the data entry process and improve the machine-user relationship. The misuse or inappropriate application of graphics can be detrimental, resulting in user fatigue, confusion, reading and comprehension difficulties and

learned helplessness. Thus, the design and selection of graphics for any program must not be based solely on aesthetic appeal, but must adhere to principles of screen design.

The designer must provide a well-conceptualized visual design to promote comfort and efficiency for the user, as well as support the content. Often, there is a tendency to design screens as if they were paper, such as top to bottom and left-justified (Jenkin, 1982).

Little research is available concerning the relative merit of each visual variable, such as colour, positioning of text, spacing or borders. We have the capacity to compare, retain or respond to seven plus or minus two "chunks" at any one time. This limited capacity was identified by Miller (1956) who coined the term "chunks" in reference to unrelated items of information. By keeping in mind this concept, the screen designer can employ a variety of techniques which will relate the various screen elements and result in greater retention, comprehension and recall abilities.

2.4.1 Text Versus Pictures

Levie and Lentz (1982) reviewed 55 experiments which compared learning from illustrated text with learning from text alone. Comparisons of learning textual information

from passages with and without pictures revealed an overwhelming advantage for the inclusion of pictures. Subjects reading illustrated text learned 1/3 more. According to Dwyer (1976), the use of certain types of visual illustrations to complement self-paced instruction can significantly improve student achievement. However, Dwyer also states that sometimes printed instruction alone is just as effective as that which is accompanied by illustrations. Booher (1975) administered six different formats for pictorial information and printed words in instructions. This experiment, which tested for short-term and perceptual memory, indicated that accuracy was greatest with clearly written procedures and that pictures do not help. Performance speed, however, increased as pictorial detail increased.

The most efficient initial understanding of procedural information occurred when both channels were used as follows: pictures were used as the primary channel and printed words were used as a secondary channel to clarify the pictures. These findings suggest that pictorial information can increase performance speed for certain tasks and that multi-channel information (pictures and words) may lead to better recall.

Haber (1970) claims that the information-processing mechanisms which we use in the memory of pictures are stored almost directly in memory as images, while the storage of

words requires an additional coding process. Thus, it appears that instructions presented pictorially may allow the reader to more readily use those cognitive processes involved in iconic imagery and pictorial perception as an aid to understanding the instruction.

2.4.2 Picture Type

The effectiveness of any computer program is related to the graphics that are used. Franzwa (1973) explored the effects of three variables on retention of pictorial information: meaningfulness; picture detail (pictures may range from simple line drawings to detailed illustrations or photographs); presentation mode (presentation or pictorial materials alone or in conjunction with verbal materials).

Franzwa (1973) reviewed several studies and concluded that when the objective is to learn words, combining words and pictures in at least the stimulus or learning situation facilitates learning; however, when the objective is pictorial recognition, combining words and pictures interferes with learning. He found that pictures which were classified as meaningful (i.e. familiar) are more easily learned than those classified as less meaningful. The three major conclusions of this study were:

- meaningfulness influences pictorial learning;
- pictorial detail influences learning;

- presentation mode influences learning.

An issue which often arises during screen design is the question of where to place the pictures. Brody and Legenza (1980) explored the possibility that selected pictorial attributes, location and type of picture can lead to improved comprehension. The two goals of their study were to determine : whether incidental learning is affected by placing a picture after, rather than before the reading passage; and whether incidental learning is affected by using a picture that represents a broad overview of an entire scene rather than one that represents a single specific incident mentioned in the passage.

The authors found that the overview pictures scored higher than did the specific incident pictures, and that placing the picture after the reading was more beneficial than placing it beforehand. By placing the picture after the written information, a general backward or review process occurs -- the reader can mentally review materials that are related to, but not necessarily included in, the picture.

One suggestion which Brody and Legenza make for further research is the determination of optimum passage length between illustrations. Other pictorial attributes which affect mathemagenic-type behaviours (behaviours which increase learning) need to be identified as well.

2.4.3 Screen Format

Design consistency reduces learning requirements because it allows skills which are learned in one situation to be transferred or generalized to another similar situation. In screen format design, consistency must be achieved in keying procedures, screen touching procedures, and screen layout. In keeping with the user's expectations, learning time is reduced because the user knows where to look for certain types of information. For example, a header or a footer which contains currently available options, location within the program, and date and time provide the user with a guide to the program.

Galitz (1981) proposes the following screen format guidelines:

Screen format layout must have consistent:

- relationships between captions and data fields
- relations between headings and captions
- placement of identifying information
- differentiation of field groupings
- placement of common elements

Design trade-offs:

- some guidelines are incompatible
- human requirements must take precedence over machine requirements

- the design must allow for a compromise in accuracy, time, cost or ease-of-use requirements.

Information must be placed so that it provides:

- an obvious starting point in the upper left-hand corner of the screen
- specific areas for commands and feedback messages
- cohesive grouping of screen elements
- symmetrical balance

Screens should provide cohesive groupings of elements so that users perceive large screens as having identifiable pieces. People prefer viewing chunks of data. Use of contrasting elements is one way to call attention to different display elements. Screens should also be structured to provide symmetrical balance to help users establish a meaningful form. By reserving specific areas of the screen for certain information, users will know where to look for them. Only information which is essential to making a decision or performing an action should be provided. Also, all data related to one task should be on a single screen. Users should not have to remember data from one screen to the next.

There is no precise percentage of screen space which must be filled. Any screen, whether purely textual or pictorial or a combination of both, must not provide

information overload. Breaking text into smaller units or paragraphs can decrease confusion and boredom. Users may be tempted to skip screens which require a lot of reading. Pop-up windows which allow users to view hidden information at their convenience help to reduce the information burden. The computer is a medium which is very different from written materials. Screens cannot mimic pages in a book. A simplistic page-turning program does not take advantage of the techniques available with a computer. After all, it is a lot cheaper to produce a book than an electronic page-turner.

2.4.4 Colour

The use of colour as a coding agent in software to focus attention on critical characteristics of the content may increase users' comprehension (Lamberski and Dwyer, 1983). An important question is, how much colour is too much? In a very dense visual display, colour-coding at some minimal level helps in picking out information, but if you increase the use of colour, its value as a selection cue diminishes. Lamberski and Dwyer conducted an experiment in which they provided colour-coded or black and white self-paced instructional and testing materials. Students who received colour-coded instructional materials and either colour-coded or monochrome test materials did significantly

better than those who received monochrome learning materials. This suggests that more visual colour-coding in instructional materials enabled greater concept acquisition and greater ability to retrieve information.

The authors surveyed the literature and found evidence for learners' preference for coloured materials. Colour may improve users' performance on a task by influencing attention and motivation.

Benbasat and Dexter (1985) conducted an experiment designed to assess the individual and joint effects of colour and graphics on a marketing decision-making task. Their findings included improved decision quality for field-dependent subjects using colour-coding. They suggest that colour-coding may have many benefits, but that it is important to consider the personality type of the learner. Unfortunately, real-life constraints, such as time and cost, do not usually allow for the individualization of materials design which may be achieved in a controlled, experimental setting.

A colour-coding scheme must be relevant and known. Relevance is achieved when the code enables the user to attend selectively to the data that are needed. When developing a colour-coding strategy, one must consider spatial formatting, highlighting and the use of messages.

There are several important considerations in the selection of screen colours: terminal colour capabilities

(i.e. monochrome, coloured graphics abilities, resolution); consistency; compatibility with user expectancies (i.e. a green arrow on a touch sensitive screen may represent "go"); discriminability; frequency of use and importance; relevance and confusion.

For normal discrimination, colours should be widely spaced along the visual spectrum. The most generally useful colours are red, green, blue and yellow. Contrasting colours such as red and green or blue and yellow or black and white provide emphasis and separation. Colour pairs such as orange and yellow or blue and magenta illustrate similarity.

The human eye can only effectively distinguish eight colours at one time. As the number of colours in a display increases, so will response time, confusion and the demands on hardware for producing each colour reliably.

How much colour is too much? There is no definite answer. However, one should apply just enough colour to fulfill the needs of the application and generally, alphanumeric displays should contain no more than four colours.

2.4.5 Screen Design Principles

There are five basic principles of screen design: proportion, emphasis, unity, sequence and balance (Reilly

and Roach, 1986).

Proportion: To avoid cluttering screens, columns, spacing and grouping may be employed to produce orderly and legible displays.

Sequence: Certain things attract the eyes. The eyes tend to move from big to small objects, from bright to dull colours and from colour to black and white, from irregular to regular shapes, and from moving to still images.

By manipulating eye attractors, one can plan how the information on a screen will be ordered for use.

Emphasis: To enhance important or infrequent messages, they should be placed in the central field of vision or in a window. Critical information, high priority messages, special functions, and feedback messages should be highlighted. Simply by increasing white space or background colour around an important area makes it stand out. By using colour conservatively, it can be applied to important aspects of the screen, thereby emphasizing these elements.

Unity: The principle of unity demands that the elements of a design look as if they belong together and that objects be related in size, shape, texture and colour.

Components should be of the same order or category.

For example, font sizes may vary but the lettering should be the same style. When screen design violates the principle of unity, whether this violation occurs throughout the program or merely on one screen, the user will experience some degree of stress and confusion.

Balance: Balance is the distribution of optical weight in a picture. Optical weight refers to the perception that some objects appear visually heavier than others. A balanced screen is one in which half of the optical weight is roughly on one side of the screen and the other half is on the other side of the screen. While centering elements results in symmetry, there should also be a balance of iconic and digital displays, appealing to both the right and left hemispheres of the brain (Braden, 1986).

2.4.6 Layout Types

Competition for attention is a problem in computer display design. User discomfort, irritability and inefficiency may result when a user must interact with confusing screens. Various principles of visual design used in the field of advertising can be applied to screen design. Six basic layout styles, all of which adhere to the five fundamental principles of design, may be considered when

developing software (Reilly and Roach, 1984).

Mondrian Layout: This layout consists of squares and rectangles of different proportions that fill a prescribed space. Each shape contains pictures or alphanumeric information. This layout format is useful when several unrelated tasks are to be performed at the same time.

Picture-Window Layout: The screen is divided into a large box or window and a narrow rectangle is placed near it. Pictorial information appears in the window and related text appears in the rectangle. This format is employed when the picture contains most of the information and the text merely clarifies the picture.

Copy-Heavy Layout: This format is often used for menus, as it contains only text of various sizes, thereby creating sequence and emphasis.

Frame Layout: The Frame Layout employs a pictorial design as a frame for textual information. A portion of a picture fills the majority of the screen and a small amount of text appears over the non-essential part of the picture. A pop-up window may be accessed with a function key or touch zone.

Cartoon Layout: This format illustrates steps in a

procedure. A typical example of the Cartoon Layout is a flowchart.

Letter-Pattern Layout: Another technique which is effective for directing the user's eyes is to structure the screen content around an invisible alphabetic shape. By placing information or elements along the pattern of a letter, without making the shape so obvious that it becomes the most noticeable feature of the screen, the user will be directed.

Clearly, guidelines for screen design are essential when developing a program, whether it be a data entry system, computer-based training, or development software. While attention and monies are allocated to instructional design, technical system features and content, the machine-user interface is often neglected, resulting in a less than ideal program.

CHAPTER III

APPLI TOUCH SYSTEM DESIGN

3.1 System Description

Appli Touch is a computer program which allows the claimant to fill out an application for Unemployment Insurance Benefits electronically. Great attention was given to the design of the machine-user interface. Because of the diversity of the target users in terms of literacy, typing skills, mother-tongue, level of education, familiarity with computer technology, previous experience with applying for benefits and willingness to use a new system as opposed to the traditional paper application, Appli Touch had to be easy, quick and enjoyable to use.

Because younger people seem to be more willing to use new technologies, Appli Touch will probably never totally replace a need for Commission staff to aid some applicants. Appli Check would allow the clerk to enter information for claimants who cannot or are not willing to use Appli Touch; yet, there will still be a need in the near future for paper applications, since nearly 25% of applications are mailed in. So, Appli Touch is not a system which will totally replace existing means of data entry; however, it offers an effective method for a sector of the claimant population.

Appli Touch is distinguishable from other public access

computer services because it is a one-shot deal. That is, once a claimant makes an application with Appli Touch, he/she never requires this service again. Information for renewal claims will be downloaded and updated by the clerk with the Appli Check system. The claimant, therefore, does not have the opportunity to use the system repeatedly, as with ATMs; therefore, there is no chance to become increasingly familiar with the system. Due to this constraint, which is a function of the type of service being offered, Appli Touch must be easy enough to use such that a claimant develops a conceptual model and uses the system correctly the first time.

3.1.1 Content of Appli Touch

The content of Appli Touch was taken directly from the paper forms and the wording was slightly modified in order to better suit the medium. Rather than simply recreating the appearance of the paper application on a computer screen, one screen was allocated per question; that is, a question appears on the screen, the claimant answers it, then the next screen appears. This breakdown of data elements was designed in order to reduce the confusion, complexity and ambiguity often experienced with any type of form, particularly by first-time users. Any forms software should help the user in filling in the form, either through

inputting new data or from existing data, by capturing and sharing data and by performing calculations on the data where required (Romei, 1989). The questions had to remain as close as possible to those on the paper forms in order to acquire the data necessary for decision-making and calculation.

3.1.2 Machine-User Interface

While Appli Touch may be thought of as an electronic form, it is unique in that its design deviates from the traditional philosophy which advocates that the screen's mirroring of the original paper document. On the contrary, Appli Touch screens look nothing like the Application for Benefits form and supplementary questionnaires. (For a sample of an Appli Touch screen, see Appendix B). While the program is aimed at capturing the same information as the paper form, it was totally altered. Usually, electronic forms consist of screen after screen filled with fields, with the goal being to place as much information on each screen as possible.

A review of screen design literature as well as one-to-one testing of the prototype lead the designer to conclude that users can better develop a cognitive model of a program and prefer a program which has more screens that are clear and easy to understand, than a program which has fewer but

more complex screens which mimic a paper-based layout.

Computer-user interface design is continuously evolving. Graphics and input devices have only scratched the surface of what is possible (Verplank & Kim, 1987). A main feature of the Appli Touch system is the combination of the keyboard and touch-sensitive screen as input devices. Unlike ATMs, which require little data entry (Personal Information Number, selecting an option and entering an amount of money), Appli Touch requires the claimant to type various information elements, such as name, full address and name and address of the previous employer. Wherever possible, the program was designed to offer choices from which the claimant merely makes a selection by touching the part of the screen which contains his/her choice. This design feature greatly reduces the amount of typing, thereby making the system more practical and easy to use even for those claimants whose typing skills are limited to hunting and pecking.

Another feature of Appli Touch is the use of colour and graphics. Extensive research was conducted in order to identify guidelines and appropriate uses for colour. The key here was to facilitate the data entry process and not to distract the user with inappropriate applications of colour and graphics. A Mondrian layout was applied to divide each screen into three windows or functional areas: a header, a footer and a work area. The header and footer are reserved

sections. The header occupies two lines at the top of the screen and contains status information which informs the user of the date, time and name of the form and sub-section on which he/she is currently working. The footer indicates which function keys are currently available. For example, some screens contain required data fields whereas input on other screens is optional; thus, when the "I don't know" option is unavailable, it is not listed in the footer.

Instead of referring to function keys as F1, F2 and so on, a colour was assigned to each of the four function keys which are available. The keys were covered with key caps in their assigned colours, and the footer refers to the currently available key options by colour rather than by key name. Because the majority of target users have little or no computer operating experience, it was felt that reference to function keys would be intimidating and confusing.

While a preferable and more consistent design would allow for the direct touching of the footer area in order to perform a function, the limitations of the authoring language are such that a touch-zone may not be active while a loop is awaiting a response; that is, a claimant could not select a function (eg. try again) until he/she completes the input for a field and presses the enter key. Thus, colour-coded function keys were the alternative solution.

Appli Touch currently operates in either English or French, as selected at the start of the program by the user.

Eventually, Appli Touch may be programmed in a third language to suit the demographic demands of the local population.

Appli Touch has a limited amount of intelligence. It judges various fields and informs the claimant of non-valid fields. It then prompts the claimant to re-enter data in the field. Appli Touch employs an algorithm to calculate the validity of a social insurance number at the beginning of an application. Supplementary questionnaires are presented based on responses to key fields. (See Appendix C for all forms included in Appli Touch). For example, on the paper application, everyone is asked whether maternity benefits are being requested. In Appli Touch, the system only presents this question for claimants who selected "female" for the question of sex. Similarly, for "Reason no longer working", choices for females include "maternity" while choices for males include "paternity". When a claimant answers "yes" to questions such as "Are you taking a training course?", the program automatically branches to the appropriate supplementary questionnaire, thereby eliminating the need for fact-finding by agents who discover that the claimant forgot to fill out the necessary paper forms.

3.2 Software

A prototype of Appli Touch was designed and programmed over a three-month period in 1988. In consultation with a programmer, the author developed the program with the Tencore Authoring Language. A total of 600 hours of development time were allocated to the project, including the time of staff members who participated in the evaluation. Hardware and software required for the development of Appli Touch were already available, so resource costs were limited to person-hours.

The program consists of the Application for Benefits, as well as supplementary questionnaires for student / training, part-time employment, and self-employment. Appli Touch currently has 440 kilobytes of source code and over 200 variables, with the potential for expansion. For example, other supplementary forms such as farming will likely be added. All data which are entered by the claimant are stored in a file. At present, these data can be called by the COBOL-based Appli Check program after which they can be downloaded into SSA.

3.3 Hardware Requirements

The hardware requirements for Appli Touch are state-of-the-art. An IBM Infowindow with touch screen capabilities and enhanced graphics is required. The price of this equipment is decreasing rapidly. The current price tag for one unit is approximately $ 8000.

CHAPTER IV

EVALUATION PROCEDURE

4.1 Prototyping

Because of the hierarchical nature of the Department of Employment and Immigration, several layers of approval are required in order to receive funding for a project. Once the initial concept of Appli Touch had been explained to those possessing the decision-making power, a prototype was developed. This prototype was a small portion of the program. The goal of the prototype was to illustrate the potential of Appli Touch as a self-service claims-taking system, and its ease of use; furthermore, acceptance was sought for the design decisions made to satisfy user requirements. Once this prototype was accepted and resources were allocated to the project, the author and later, the programmer, worked for three months on developing the software.

4.2 Expert Review

During this stage, ten employees of the Commission participated by interacting with the system as though they were actually applying for UI benefits. Six of the participants were former Agents from CECs, and therefore

possessed the knowledge of a subject matter expert. The other four were involved in various aspects of the development of the SSA project. Throughout the initial development of the project, from July to October of 1988, informal sessions were held with these participants while the designer took note of personal likes and dislikes, problems with interpretation or presentation of the content, spelling errors, and technical bugs, such as incorrect branching.

4.3 One-to-One Evaluation

During the course of development, other employees of CEIC were invited to interact with Appli Touch by pretending to make an application for UI benefits. Ten employees, who were neither directly involved in SSA nor related projects, provided valuable feedback. Unlike the subject matter experts, these people were not familiar with other insurance related computer systems and therefore, they did not expect the system to operate like SSA. In essence, these were people whose knowledge of computers was limited to simple word processing. They typified the target users.

4.4 Small-Group Evaluation

The next phase in Dick and Carey's model is the Small-Group Evaluation. The two main purposes of this stage are:

to determine the effectiveness of the changes made following the one-to-one evaluation, and to determine whether representatives of the target population can use the materials (in this case, the computer system) without interaction with the designer. Dick and Carey suggest a sample size of eight to twenty subjects.

The objectives of the small-group evaluation were to verify the technical effectiveness of the program, to validate the design features and to measure users' attitudes towards the system. The validity of the attitude questionnaire would also be assessed.

4.4.1 Sources of Feedback

Three main sources of information were the sample of claimants, the evaluator, and two clerks.

Claimants: The claimants provided two types of information. Interface and technical problems were verbally identified by claimants as they worked with the Appli Touch program. Following the completion, print-out and verification of their application, users completed an attitude questionnaire. (See Section 4.4.2).

Evaluator: The author/designer observed the data entry process and recorded technical bugs which only someone with

a specific knowledge of the design (i.e. branching points, feedback messages) could detect. Print-out errors were also recorded. Machine-user interface problems which the user did not verbalize, but which were noted by the observer, were recorded as well. For example, if a particular question required several readings, it was noted as being potentially ambiguous and requiring revision.

Clerks: On each of the two days of the evaluation, a clerk reviewed the print-out and debriefed the claimants once they completed the attitude questionnaire. The clerks, who possess expertise in the data entry process and are subject matter experts, were able to detect additional problems with the print-outs. Based on their review of the data, they prepared a list of suggested modifications or enhancements which would simplify the review process. (For a sample of a computer-generated application form, see Appendix D).

4.4.2 Construction of Attitude Questionnaire

An attitude questionnaire was created by the author (see Appendix E). This Likert-type questionnaire contained three embedded clusters of attitude statements: user's perception of the system or likeableness of the system; rating of the machine-user interface; and rating of the screen design. The questionnaire also included sections for

personal information and comments. The method of summated ratings (Likert, 1932) requires subjects to indicate the degree of their agreement or disagreement with each item by selecting one of five possible alternatives.

Due to the diversity of the target population, the questionnaire was designed with positively worded statements, in an attempt to minimize ambiguity and/or confusion which could possibly result. Simple statements were written because the target clients may have a low level of education. Allen (1957) summarizes the criteria proposed for editing statements to be used in the construction of attitude scales. Among these criteria are the avoidance of the "use of words that may not be understood by those who are to be given the completed scale" and "avoid the use of double negatives" (p. 13). Thorndike (1982) supports this notion when he states that test items should be clear and unambiguous and that semantic obscurity and syntactic complexity should be avoided. On the other hand, statements which are likely to be endorsed by everyone must be removed from a questionnaire. The questionnaire contained 18 statements.

4.4.3 Testing Procedure

A two-day period was allocated for testing out Appli Touch at the Ottawa Central CEC. A decision was made to

extract additional feedback during a debriefing session. The combination of an easily comprehensible questionnaire and a debriefing session were deemed the most appropriate approach for identifying users' attitudes towards Appli Touch.

Permission was given for two clerks who were working as subject matter experts at National Headquarters to participate in the evaluation. The night prior to the evaluation, the hardware was set up at the CEC and the software was installed and tested.

On the first morning of the evaluation, the programmer remained at the CEC in case the system crashed due to unforeseen technical bugs. The designer stayed in a room adjacent to the reception area. The computer was set up in a quiet area so that subjects would not be distracted by the constant flow of traffic. A clerk was stationed in the next room, where the review of print-outs and debriefing of the participants would take place. The receptionist at the CEC agreed to participate in the evaluation. Once she determined that an individual wanted to make a claim for benefits, she asked this individual whether he/she would be willing to try a new system of applying rather than the traditional paper forms. When a claimant agreed, he/she was directed to the adjacent room where he/she was greeted by the designer. Only one claimant, who was functionally illiterate, was unable/unwilling to use Appli Touch.

Each claimant was briefly informed of the procedure and seated at the terminal. The designer remained in the room and the claimant was aware that he/she could ask questions at any time. The designer sat behind the claimant and quietly took note of any errors, inconsistencies or difficulties which the user was experiencing.

The mean time spent completing the application was 21 minutes. No comparable figure is available for the paper application. Once the application was completed, it was automatically printed out on a printer. The designer then lead the claimant into the next room where the clerk reviewed the print-out and completed the paper records of claim for any additional information deemed necessary. The claimant signed the print-out, thereby completing the application. The clerk then asked the claimant to fill out a questionnaire. Afterwards, the claimant was debriefed and thanked for participating.

A total of 11 claims and questionnaires were completed during the two-day period (See Appendix F for sample description). There were several peak times during each day when the computer was continuously being used, such as at lunch time. As well, there were dead periods when no one came into the CEC to apply for benefits. Some technical problems with print-outs were experienced and some minor programming had to be done, which made the computer unavailable for testing for a short period of time.

CHAPTER V

RESULTS

The Pearson product-moment correlation (or Pearson r) was calculated for selected pairs of attitude statements in each of the three clusters. The strength of these linear correlations was examined in order to determine the proportion of variance in either variable X or Y that is linearly associated with the other (Keppel and Saufley, 1980). It must be kept in mind that due to the small sample size, no conclusive findings can be made.

5.1 Validation of the Attitude Questionnaire

One of the first concerns of the designer was whether users with below average typing skills would find the Appli Touch program difficult to use. No significant correlation was found (r=.054, p>.05, df=9). With nine degrees of freedom, a correlation of .60 or greater would be significant at an alpha level of .05. This lack of correlation between these two items indicates a need for further study with a larger sample, as it appears that users' typing ability has no relationship with their ability to use the program.

All but one of the paired comparisons in the likeableness cluster (See Table 1) were found to

	Question 1	2	3	4	5	6	7
1 Typing skills		r=.054					
2 Easy to use			* r=.671	* r=.671	r=.389	* r=.608	* r=.671
3 Would use again					* r=.671	** r=.946	
4 Good idea to apply with a computer					* r=.671	** r=.946	** r=.946
5 Liked using computer						** r=.875	* r=.671
6 Liked using computer more than paper							
7 Application is a good idea							

Table 1. Pearson Product-Moment Correlation Coefficients for Likeableness Cluster

*p<.05 **p<.01

have a statistically significant positive correlation. Ease of use was not correlated with users liking to use the computer application (r=.389, p>.05). Even though users rated the program as easy to use (82% strongly agreed), the actual task of applying for benefits and having to answer numerous questions may have lead to this lack of correlation. On the other hand, there were extremely strong correlations between liking the computer and liking it more than paper (r=.875, p<.01); thinking that it is a good idea to apply with a computer and liking the computer more than paper (r=.946, p<.01); thinking that it is a good idea to apply with a computer and that the application is a good idea (r=.946, p<.01); willingness to use Appli Touch again and liking the computer more than filling out paper forms (r=.946, p<.01).

A significant correlation was found for users' rating of the ease of use of the application and whether they would use this application again (r=.671, p<.05). There were significant correlations between ease of use and thinking that it is a good idea to use a computer (r=.671, p<.05); ease of use and liking the computer more than filling out paper forms (r=.608, p<.05); ease of use and thinking that overall the application was a good idea (r=.671, p<.05); liking Appli Touch and willingness to use it again (r=.671, p<.05); thinking that it is a good idea to apply with a computer and liking the computer (r=.671, p<.05); and liking

the computer application and thinking that overall it is a good idea (r=.671, p<.05).

Thus, it appears that there are significant correlations between various items which not only validate the questionnaire itself, but, when combined with the high ratings of various attitude statements, suggest positive attitudes towards the system.

None of the correlation coefficients calculated in the machine-user interface cluster was statistically significant. This may be due to the pairing of incomparable items. (See Table 2). For example, the rating of the helpfulness of examples was compared to the rating of touching as an easy way to answer (r= -.025, p>.05). The items in this cluster all relate to the interface; yet, they seem to be independent. Thus, one may very well think that touching the screen is an easy way to answer and at the same time think that the examples were not very helpful. For this cluster, Pearson r correlations did not provide many insights. One finding which was unexpected was the lack of correlation between thinking that touch was an easy way to answer and liking the combination of touching and typing (r=.174, p>.05). This finding may be due in part to liking the touch screen technology but not really liking the combination of touching and typing.

Product-moment correlation coefficients for the screen design cluster yielded some unusual findings (See Table 3).

	Question 8	9	10	11	12	13
8 Application includes all instructions		r=.076	r=.147	r=-.290	r=-.283	r=.321
9 The instructions were clear			r=-.194	r=.-219	r=-.140	r=-.149
10 Able to correct/ change answers easily				r=-.229	r=-.271	r=.241
11 Examples were helpful					r=-.025	r=.122
12 Touching screen was easy way to answer						r=.174
13 Liked combination of touching and typing						

Table 2. Pearson Product-Moment Correlation Coefficients for Machine-User Interface Cluster

*p<.05 **p<.01

	Question 14	15	16	17	18
14 Display clear and test easy to read		r=-.100	r=.313		r=0.000
15 Visuals maintained my interest			** r=.805		r=0.000
16 Color used appropriately					r=0.000
17 Sound used appropriately					
18 Graphics were well-designed					

Table 3. Pearson Product-Moment Correlation Coefficients for Screen Design Cluster

*p<.05 **p<.01

There was a strong relationship between the statements "The visual presentation maintained my interest" and "Colour was used appropriately" (r=.805, p<.01). However, there were zero correlations between visual presentation and "The graphics were well-designed", colour being used appropriately and the graphics being well-designed, and visual presentation and graphics.

The questionnaire requires some revision since some of the statements in this cluster are ambiguous. For example, naive users do not possess the screen design expertise required to respond to "The graphics were well-designed" and "Colour was used appropriately". Clarification of these statements and further testing with a larger sample will indicate whether there are significant correlations in this cluster.

While the instrument used for measuring claimants' attitudes towards Appli Touch was deemed valid, several modifications are recommended prior to field testing. The statement regarding the appropriate use of sound shall be removed, as sound is not a relevant feature of this system. Also, the statement "Color was used appropriately" will be reworded to read "I liked the colors". Similarly, the statement "The graphics were well-designed" shall be changed to "I liked the graphics" as the original wording may have been ambiguous.

5.2 Users' Perception of the System

The likeableness of Appli Touch was high (Figure 3). Several statements on the questionnaire were aimed at determining whether claimants liked the program, the idea of it, whether they would use it again for future applications for benefits or other services, whether they preferred it over paper-based applications, and whether they thought it was easy to use.

Eighteen percent agreed somewhat and 82% strongly agreed that the application was easy to use. No one expressed negative reactions to this statement. Nine percent agreed somewhat and 91% strongly agreed that they "would use this application again".

Eighteen percent agreed somewhat and 82% strongly agreed that they "liked using the computer application". No one disagreed. Ninety-one percent strongly agreed with the statement "I liked using the computer application more that I like to fill out paper forms", and only 9% (one subject) disagreed somewhat. This is an important finding since 73% of subjects had previously applied for unemployment insurance with the paper-based method; therefore, the majority was able to express an opinion based on having had experience with both methods of application. In response to the statement, "Overall, this application is a good idea", 9% agreed somewhat and 91% strongly agreed.

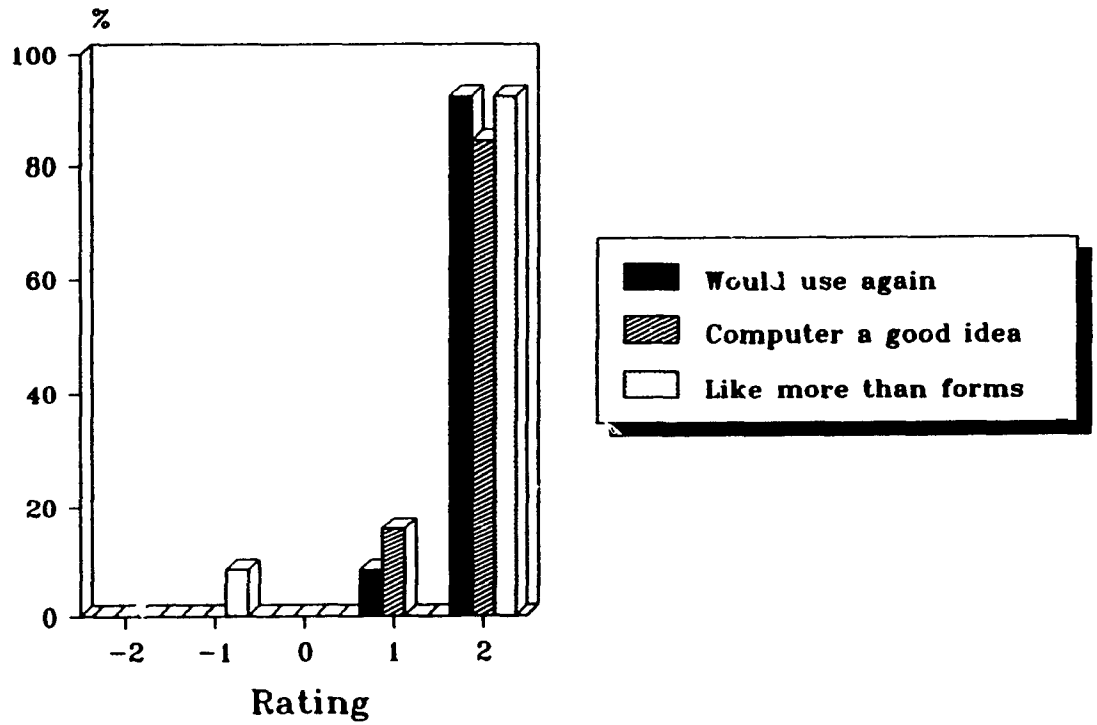


Figure 3. Responses to key questions in the likeableness cluster

5.3 Rating of Machine-User Interface

The second cluster of statements was designed to identify strengths and weaknesses of the interaction between the user and the computer. In response to "The application includes all of the instructions necessary to use it", 18% disagreed somewhat, 18% agreed somewhat and 64% strongly agreed (see Figure 4). The apparent explanation for this finding is two-fold: no on-line introductory instructions were available; and due to the presence of the evaluator during the application process, claimants may have relied somewhat on the evaluator rather than carefully reading the instructions on the screens. For example, "Press Enter" was clearly marked whenever it was necessary, yet claimants often did not bother to look for directions, instead turning to the evaluator for immediate help. While minor modifications may be made during the revision phase, it is believed that many areas of concern will cease to exist when the program is implemented in a setting where an evaluator is not present.

In response to "The instructions were clear", 9% agreed somewhat and 91% strongly agreed. Thus, it does seem that claimants did find the program self-explanatory.

Twenty-seven percent agreed somewhat and 73% strongly agreed that they were "able to correct and change my answers easily". Yet, open-ended questions at the end of the

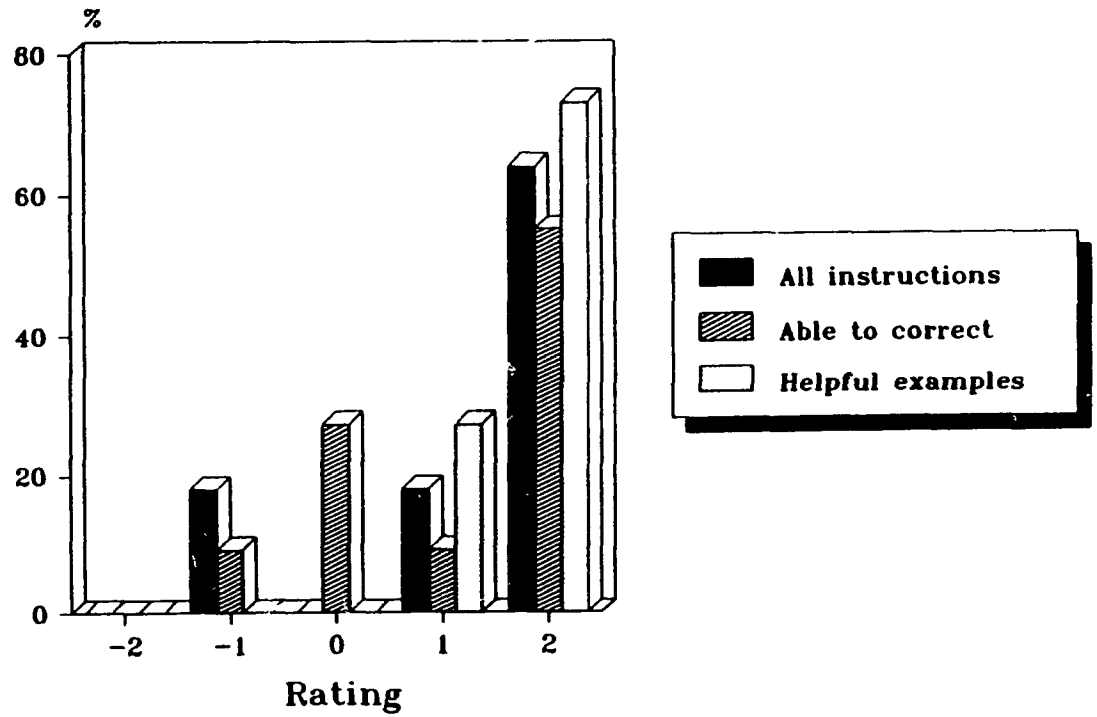


Figure 4. Responses to key questions in the machine-user interface cluster

questionnaire yielded feedback which suggests that claimants actually had some difficulty in initially understanding how to correct their answers. For example, in some cases, backspace is employed while in other cases, a function key must be pressed in order to refresh the screen and try again.

Regarding the statement "The examples provided in the application were helpful", 9% disagreed somewhat, 27% did not know, 9% agreed somewhat and 55% strongly agreed. The range of responses is likely due to the small number of examples actually provided in the program. Further study with subject matter experts is required in order to determine what, if any, examples would aid the data input process.

Nine percent agreed somewhat and 91% strongly agreed that "Touching the screen was an easy way to answer questions" and 18% agreed somewhat and 82% strongly agreed with the statement "I liked the combination of typing and touching the screen". This design feature was well-liked.

5.4 Rating of the Screen Design

The third cluster of attitude statements was aimed at determining whether the screens were clear, easy to read, whether the graphics were pleasing to the eye as well as whether they provided a source of motivation. Also, this cluster was to determine whether claimants liked the sound, colour and graphics.

Nine percent agreed somewhat and 91% strongly agreed that the "display was clear and the text was easy to read" (See Figure 5). Nine percent agreed somewhat and 91% strongly agreed that the "visual presentation maintained my interest".

In response to "Colour was used appropriately", 9% did not know, 18% agreed somewhat and 73% strongly agreed. It seems that this statement was inappropriate for the sample users because they have no expertise in the area of screen design; thus, while they could state whether they liked or disliked the colours used, they had no basis for stating whether colour was used appropriately. Similarly, 100% strongly agreed that the "graphics were well-designed". They probably meant that they liked the graphics, for they have no expertise in the area of screen design principles.

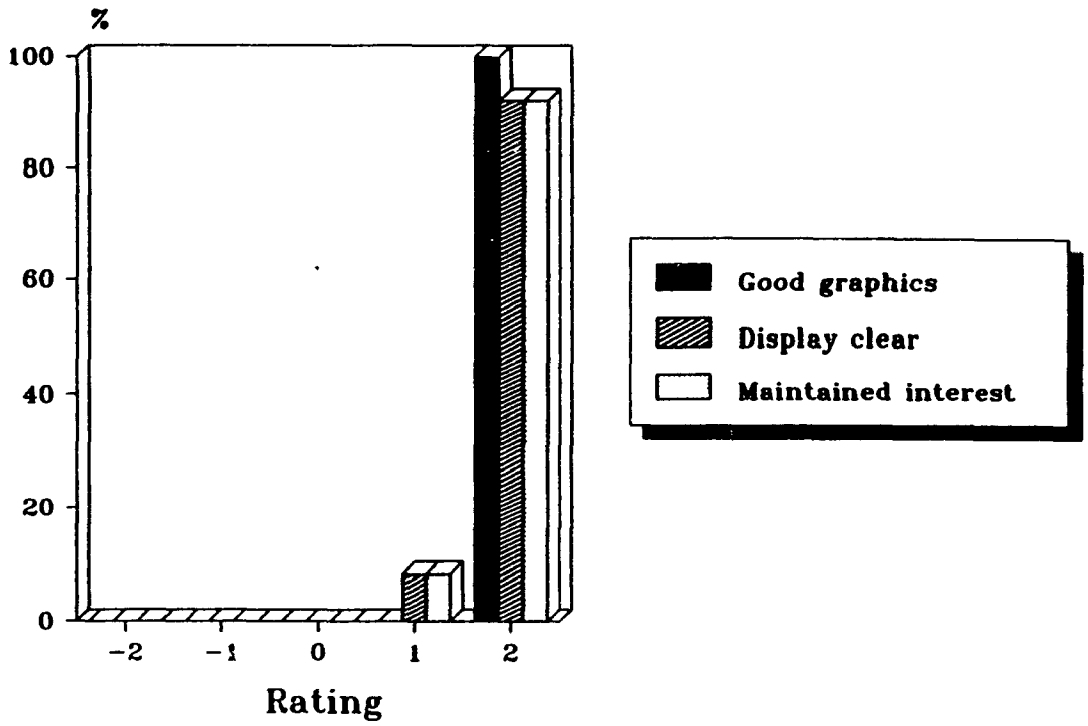


Figure 5. Responses to key questions in the screen design cluster

5.5 Technical Problems

Review of the print-outs by the participating agents indicated technical errors and omissions (see Appendix H for a sample print-out). The agents' observations and interactions with the claimants resulted in a more comprehensive list of technical problems. (For a summary of technical modifications, see Appendix I). Several minor changes were made during the two-day evaluation, as technical bugs arose. At one point, a claimant's application printed out and was missing a number of fields, even though he had entered the corresponding data with Appli Touch. In order for the claim to be complete, the agent had to add a form called Supplementary Record of Claim and fill in the missing information.

Other technical problems which arose were easily corrected. The designer noted problems such as incorrect branching or inability to return to a previous question when this option was identified as available in the footer information. So, the designer did some programming between client trials in order to correct these flaws.

Some problematic areas were not as easy to overcome and still other areas required further study following the evaluation. For example, the on-screen keypad graphic was designed without the placement of dead zones between the numbers. Sometimes, a claimant would touch the border

between two numbers and the computer would read the value of the touch zone which was covered more by the claimant's finger. This problem resulted in user frustrations and input errors. A revised keypad design was created following the evaluation. The new design contains visual dead zones which, when touched, merely beep. This design allows for more accurate input. Further study was required for the problem of the color-coded key caps. Fortunately, a new version of the Tencore Authoring Language has since been released, which will allow the on-screen references to function keys to be programmed as active touch zones. Therefore, colour-coded function keys could be eliminated and users could activate the desired function by directly touching an icon or an area on the screen. This feature would improve the machine-user interface.

CHAPTER VI

DISCUSSION AND CONCLUSION

A small-group evaluation of a public access computer-based application for unemployment insurance benefits was conducted. Attitudes towards the system were generally positive. While the sample was small, preliminary analysis suggests that this system will be accepted by the public, but that in order for it to be more user friendly, better on-line help and minor modifications are required.

The results of the evaluation can be summarized as follows: the machine-user interface was fairly easy to understand and there were minor difficulties with data entry; nearly complete and accurate applications were produced; claimants perceived the system as easy to use, fun, and fast; claimants preferred the system over written applications and they would use the system again.

Through observation, it was determined that despite the range of claimants' jobs, no computer literacy problems were detected. All subjects in the sample understood the program content and were able to perform the data entry process via the combination of typing and screen touching.

Overall, the design of the interface seems to consider the diverse needs of the target population. However, due to the small sample size, field testing will provide clearer insight. (For a summary of responses to the questionnaire,

see Appendix G and for a summary of users' comments, see Appendix H).

Despite the small sample size, the evaluation which was conducted may have a tremendous impact on the role which Appli Touch will assume in the Canada Employment Centres across Canada. Although a larger-scale evaluation is required, the results of the small-group evaluation provide many insights into the technical quality of the system, whether the target audience will embrace this new technology or reject it, and which aspects of the machine-user interface should be modified. The evaluation of Appli Touch with content experts, representatives of the target population and actual claimants will result in a program which performs better and is well-received. The long-term cost-effectiveness of formative evaluation is well worth the initial, minimal expenses in terms of human resources and money. Appli Touch may eventually be installed in 250 to 350 Canada Employment Centres. Because its implementation will occur simultaneously with that of the Appli Check program and the Support System for Agents, it is virtually impossible to project the cost-effectiveness of Appli Touch alone. However, the fact that Appli Touch will require less data entry by the clerk strongly suggests that this program will have a beneficial impact on operations and that it will lead to a reduction in overpayments and underpayments which are due, in part, to human error.

The last phase of formative evaluation is field testing, which allows one to determine whether the changes made following the small-group evaluation are effective and whether the software functions well in the desired environment.

Lead-site testing is tentatively scheduled for December 1990. At that time, Appli Touch will be set up in approximately five CECs and its technical ability to communicate with Appli Check will also be evaluated.

The use of touch screen technology is emerging as a popular medium in information retrieval. Appli Touch is innovative in that it applies this technology to a public access data entry system. With the proposed installation of Appli Touch in CECs across Canada, it is expected that this type of service will join the ranks of automated teller machines and on-line library catalogues. By providing end users with this method of applying for UI, Employment and Immigration Canada can offer more efficient and convenient service to clients and secure more reliable information at the front-end. In addition, the computer will assume some of the repetitive functions and liberate Commission staff from the manacles of the paper-burden. The formative evaluation of a public access computer-based application for unemployment insurance benefits has placed Employment and Immigration Canada and the Canadian population on the threshold of technological change.

References

Benbasat, I. & Dexter, A. S. (1984). An experimental evaluation of graphical and color-enhanced information presentation. Management Science, 31(11):1348-1364.

Booher, Harold R. (1975). Relative comprehensibility of pictorial information and printed words in proceduralized instructions. Human Factors, 17(3), 266-277.

Berger, Mike & Klemperer, Katharina. (1981). Developing an effective man/machine interface for a large on-line university library. Proceedings of the 44th ASIS Annual Meeting, 18, 267-269.

Braden, Robert A. (1986). Visuals for interactive video: Images for a new technology (with some guidelines). Educational Technology, 26(5), 18-23.

Brody, Philip J. & Legenza, Alice. (1980). Can pictorial attributes serve mathemagenic functions? Educational Communication and Technology Journal, 28(1), 25-29.

CEIC. (1988). Vision of the future of automation at CEIC. Paper prepared for Employment and Immigration Canada.

Dick, Walter & Carey, Lou. (1978). The systematic design of instruction. Glenview, Illinois: Scott, Foresman and Company.

Dwyer, Francis M. (1976). Adapting media attributes for effective learning. Educational Technology, 16(8), 7-13.

Employment and Immigration Canada. (1988). Annual report: 1987-1988. Ottawa, Canada: Supply and Services Canada. (WH6-180/9/88).

Flynn, Patricia M. (1988). Facilitating technological change: The human resource challenge. Cambridge, Mass.: Ballinger Publishing Company.

Franzwa, Dale. (1973). Influence of meaningfulness, picture detail, and presentation mode on visual retention. AV Communication Review, 21(2), 209-223.

Galitz, Wilbert O. (1981). Handbook of screen format design. U.S.A.: Q.E.D. Information Sciences, Inc.

Grottola, Michael G. (1989). Preparing a formal prototype session. Mini-micro Systems, 22(1), 39-40.

Haber, R. N. & Wilkinson, L. (1982). Perceptual components of computer displays. IEEE Computer Graphics and Applications, 2(5), 23-35.

Hall, J. L. (Ed.). (1977). On-line information retrieval sourcebook. Great Britain: Billing & Sons Ltd.

Haselkorn, Mark P. (1988). The future of "writing" for the computer industry. In Edward Barrett (Ed.), Text, context, and hypertext: Writing with and for the computer. (pp. 3-13). Cambridge, Mass.: The MIT Press.

Hood, Jerry M. (1979). Demographics of ATMs. The Bankers Magazine, 162 (6), 68-71.

Jenkin, J. M. (1982). Some principles of screen design and software for their support. Computers & Education, 6, 25-31.

Keppel, George & Saufley, William H. (1980). Introduction to design and analysis: A student's handbook. New York: W. H. Freeman and Company.

Kirchner, Emil J. (1984). Report on the social implications of introducing new technology in the banking sector. Belgium: Commission of the European Communities.

Kollin, Richard P. & Shea, James E. (1986). New trends in information delivery. In Ethel Auster (Ed.), Managing Online Reference Services (pp. 385-388). New York: Neal-Schuman.

Lamberski, Richard & Dwyer, F. (1983). The instructional effect of coding (color and black and white) on information acquisition and retrieval. Educational Communication and Technology Journal, 31(1), 9-21.

Lawrence, Gail H. (1983). Libraries can learn from banks. Library Journal, 108(1), 105-107.

Leiker, L. A. (1982). Human factors considerations relevant to the performance of computer users. Paper presented to the 20th International Congress on Applied Psychology, University of Edinburgh.

Levie, W. Howard & Lentz, R. (1982). Effects of text illustrations: A review of research. Educational Communication and Technology Journal, 30(4), 195-232.

Levy, Sidney L. & Greene, Shirley. (1972). Man's interface with the money machine. Chicago, Illinois: Bank Marketing Association Research Publication.

Likert, Rensis. (1932). A technique for the measurement of attitudes. Archiv fuer Psychologie, 140, 1-55.

Martin, James. (1973). Design of man-computer dialogues. Englewood Cliffs, NJ: Prentice-Hall.

Merrill, Paul F. (1986). Computers in education. Englewood Cliffs, NJ: Prentice-Hall.

Mears, Peter, McCarty, D.B., & Osborn, R. (1978). An empirical investigation of banking customers' perception of bank machines. Journal of Bank Research, Summer, 112-115.

Miller, George A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. Psychological Review, 63, 81-97.

Podorowsky, Gary. (1988). A practical guide to the first time user/systems developer. Journal of Systems Management, 39(9), 24-27.

Ralph, Chris. (1987). In-person claims-taking and the verification process. Position paper prepared for Employment and Immigration Canada, Hull, Quebec.

Reilly, Susan & Roach, John W. (1984). Improved visual design for graphics display. IEEE Computer Graphics and Applications, 4(2), 42-51.

Reilly, Susan S. & Roach, John W. (1986). Designing human / computer interfaces: A comparison of human factors and graphic arts principles. Educational Technology, 26(1), 36-40.

Reynolds, Denis. (1985). Library automation: Issues and implications. New York: R. R. Bowker Company.

Romei, L. K. (1989). Electronic forms: Winning against high costs and obsolescence. Modern Office Technology, 34(4), 43-46.

Royal Bank. (1987). Market facts. A Royal Bank Report.

Rubens, Philip & Krull, Robert (1988). Designing online information. In Barrett, Edward (ed.),(1988). Text, context, and hypertext: Writing with and for the computer. (pp 291-309). Cambridge, Mass.: The MIT Press.

Rubinstein, Richard & Hersh, Harry. (1984). The human factor: Designing computer systems for people. USA: Digital Press.

Schneiderman, B. (1980). Human factors in computer and information systems. Cambridge, MA: Winthrop.

Tagliacozzo, Renata. (1986). Estimating the satisfaction of information users. In Ethel Auster (Ed.), Managing Online Reference Services (pp 228 - 237). New York: Neal-Schuman.

Thorndike, R. L. (1982). Applied psychometrics. Boston: Mifflin Company.

Weston, C. B. (1986). Formative evaluation of instructional materials: An overview of approaches. Canadian Journal of Educational Communication, 15 (1), 5-17.

What role for ATMs. (1988). ABA Banking Journal, (11), 45-48.

Verplank, Bill & Kim Scott. (1987). Graphic invention for user interfaces: An experimental course in user-interface design. Special Interest Group on Computer & Human Interaction, 18 (3), 50-66.

APPENDIX A:

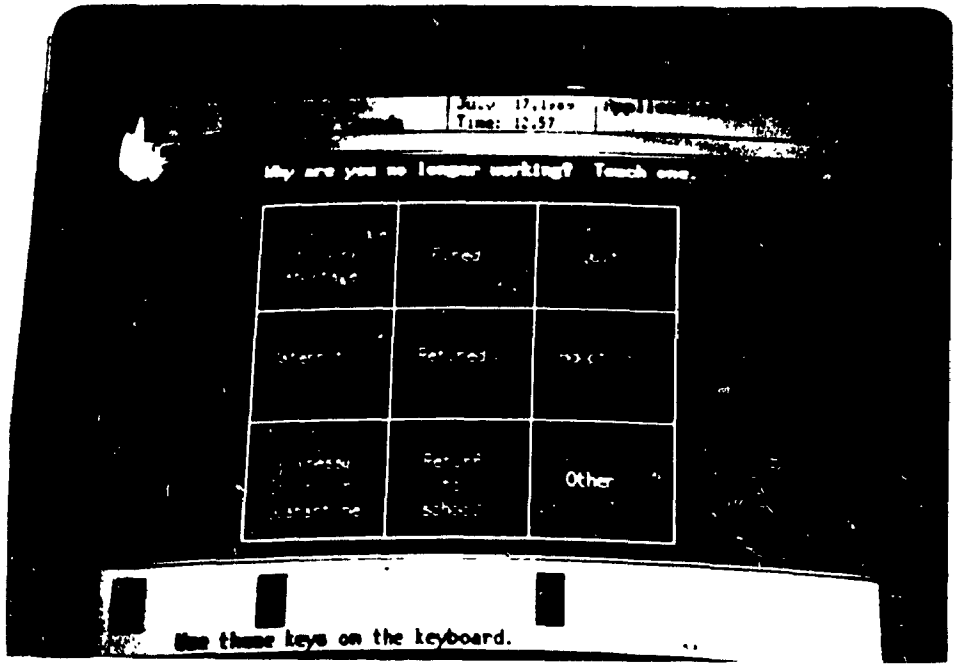
UI BENEFITS PAID IN 1987

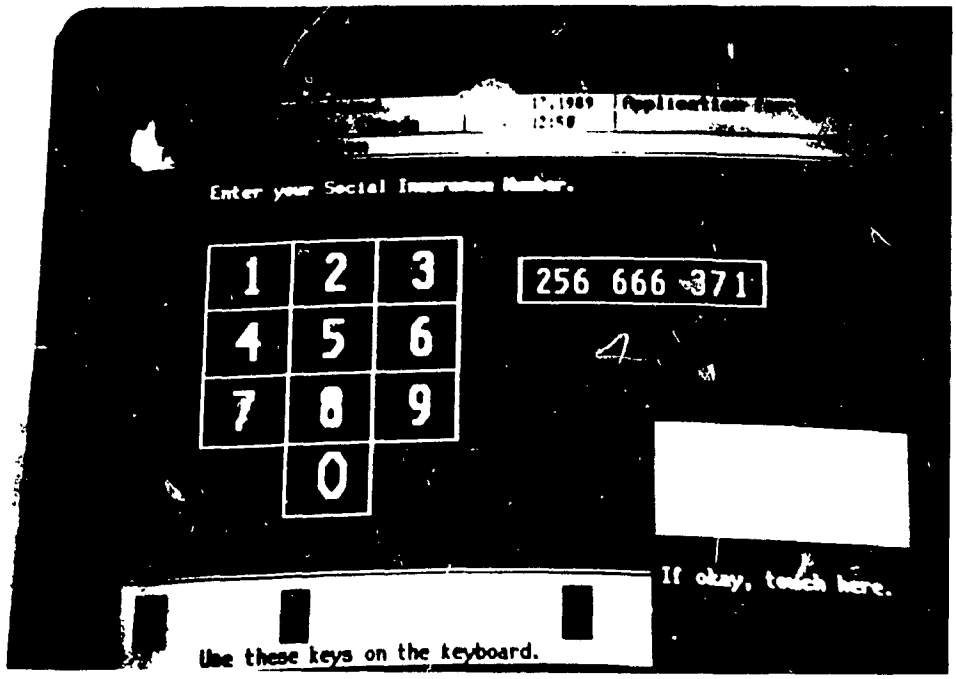
	1987
	($000,000)
By Province	
Newfoundland	651 2
Prince Edward Island	123.2
Nova Scotia	498 0
New Brunswick	564 2
Quebec	3,135.7
Ontario	2,386.6
Manitoba	331.2
Saskatchewan	287.1
Alberta	951.0
British Columbia	1,470 0
Yukon	19.9
Northwest Territories	20.6
Outside Canada	2.0
Canada (gross)	10,440.7
Less: overpayments and cancelled warrants	(95.9)
benefit repayments	(18.9)
Canada (net)	10,325.9
By Type	
Regular	9,076.4
Sickness	278.7
Maternity	506.2
Adoption	4.6
Age 65	23.1
Fishing	223.3
Training	223.8
Work sharing	17.0
Pension	137.1
Job creation	87 6
Canada (gross)	10,440.7
Less: overpayments and cancelled warrants	(95 9)
benefit repayments	(18.9)
Canada (net)	10,325 9

Note. From Annual report: 1987-1988 (p. 33) by Employment and Immigration Canada, 1988. Ottawa, Canada: Supply and Services Canada. Copyright 1988 by the Minister of Supply and Services Canada. Adapted by permission.

APPENDIX B:

SAMPLE OF APPLI TOUCH SCREENS


Time:
Why are you no longer working? Touch one.
Fired
Other
Use these keys on the keyboard.


Enter your Social Insurance Number.
1 2 3
4 5 6
7 8 9
0
256 666 371
If okay, touch here.
Use these keys on the keyboard.

APPENDIX C:

PAPER FORMS INCLUDED IN

APPLI TOUCH

Employment and Immigration Canada | Emploi et Immigration Canada

APPLICATION FOR UNEMPLOYMENT INSURANCE BENEFITS

INSTRUCTIONS FOR COMPLETION

1. PLEASE PRINT CLEARLY. REMEMBER TO SIGN AND DATE COMPLETED APPLICATION
2. MAKE SURE YOUR SOCIAL INSURANCE NUMBER IS CORRECT
3. TAKE OR SEND THIS APPLICATION TO THE CANADA EMPLOYMENT CENTRE (CEC) WITHOUT DELAY EVEN IF YOU DO NOT HAVE ALL YOUR RECORDS OF EMPLOYMENT OR YOUR MEDICAL CERTIFICATE
4. SEND ANY MISSING DOCUMENTS AS SOON AS POSSIBLE
5. IF YOU HAVE A PROBLEM COMPLETING THIS APPLICATION, ASK A CANADA EMPLOYMENT CENTRE STAFF MEMBER FOR HELP

THE INFORMATION COLLECTED ON THIS FORM IS USED FOR THE ADMINISTRATION OF THE UNEMPLOYMENT INSURANCE ACT. UNDER THE PRIVACY ACT YOU HAVE A RIGHT OF ACCESS TO THIS INFORMATION WHICH IS ALSO PROTECTED AGAINST UNAUTHORIZED DISCLOSURE UNDER THE UNEMPLOYMENT INSURANCE ACT, 1971. THE INFORMATION COLLECTED WILL BE REGISTERED IN INFORMATION BANK NO. EIC P PU150 LISTED IN THE PERSONAL INFORMATION INDEX AVAILABLE IN ALL CEC

A. PERSONAL INFORMATION

01 – Social Insurance Number

02 – Date of birth (Day / Month / Year)

03 – Sex: ☐ Male ☐ Female

04 – I prefer service in: ☐ English ☐ French

05 – Family name

06 – First name and initials

07 – Usual place of residence (Number and street or rural route number, Apt. no.; City, town or village; Province, territory; Postal code)

08 – Mailing address if different from (Number and street or rural route number; City, town or village; Province, territory; Postal code)

09 – Home telephone number (Area code)

10 – Telephone number for messages (Area code)

11 – Income tax exemption. Check the boxes that apply best to you

☐ Basic (self only) OR ☐ Basic with spouse AND ☐ With ____ children under 18 ☐ With ____ children 18 or over

B. PREVIOUS CLAIM

12 – Have you made a claim for Unemployment Insurance Benefit in the past 52 weeks? ☐ NO ☐ YES

13 – If yes, at which Canada Employment Centre?

C. EMPLOYMENT HISTORY

14 – Business name and mailing address of your last employer (Name; Address; Postal code)

15 – Location of work – if different from 14

16 – Telephone number

17 – What was your job there? (job title and duties)

18 – Why are you no longer working? If your reason for leaving is adoption, see the Supplementary Application for Adoption Benefits

19 – Are you a member of a Union or Professional Association? NO ☐ YES ☐ ▶ If yes, give name and local number

20 – First day worked (Day / Month / Year)

21 – Last day worked (Day / Month / Year)

22 – Will you be recalled to work? ☐ NO ☐ UNKNOWN ☐ YES

23 – If yes, when? (Day / Month)

24 – If you are completing this application three or more weeks after your last day worked, please give reason(s)

● IF YOU NEED MORE SPACE, USE SECTION G

Emploi et Immigration Canada | Employment and Immigration Canada

PART-TIME EMPLOYMENT QUESTIONNAIRE
QUESTIONNAIRE CONCERNANT L'EMPLOI À TEMPS PARTIEL

Surname – *Nom*	First Name and Initials – *Prénom(s) et initiales*	Social Insurance No. – *N° d'assurance sociale*

As you have stated that you are engaged in part-time employment it is necessary that you provide additional information concerning your activities. Please complete the section below. – *Comme vous avez déclaré exercer un emploi à temps partiel, veuillez nous fournir des renseignements supplémentaires sur ce formulaire.*

1 What is the Nature of your Part-Time Employment? – *Nature de votre emploi à temps partiel?*

2 Name and Address of Employer – *Nom et adresse de l'employeur*

3 How long have you been employed in this Occupation for this Employer? *Depuis combien de temps exercez-vous cet emploi?*

4 If the above employer was your full-time employer, on what date did your part-time employment commence? *Si l'employeur dont vous avez donné le nom était votre employeur lorsque vous travailliez à plein temps, quand avez-vous commencé à travailler à temps partiel?*

5 How are you paid? – *De quelle façon êtes-vous rémunéré(e)?*
☐ Hourly *A l'heure* ☐ Salaried *Salaire* ☐ Commission *Commission* ☐ Contract *A contrat* ☐ Other (explain) *Autrement (précisez)*

6 When is work performed? – *Quand le travail se fait-il?*
☐ Days *Jour* ☐ Evenings *Soir* ☐ Nights *Nuit* ☐ Week ends *Fin de semaine*

7 What are your gross earnings? *Quelle est votre rémunération brute?* $ _____ Per *Par* _____

8 Do you control the time of day the work is performed? – *Décidez-vous vous-même du moment de la journée où vous faites le travail?* ☐ Yes *Oui* ☐ No *Non*

9 Do you control the day of the week the work is performed? – *Décidez-vous vous-même du jour de la semaine ou vous faites le travail?* ☐ Yes *Oui* ☐ No *Non*

10 (A) How many days a week do you work? *Combien de jours par semaine travaillez-vous?* _____ (B) How many hours a day? *Combien d'heures par jour?* _____

11 If your part time position became a full time position and it were offered to you would you accept it? *Si ce travail à temps partiel vous était offert à plein temps l'accepteriez-vous?*
☐ Yes *Oui* ☐ No *Non* Explain *Pourquoi* _____

12 Would you accept other suitable full or part-time employment if it were offered to you? *Accepteriez-vous un autre emploi convenable à plein temps ou à temps partiel?*
☐ Yes *Oui* ☐ No *Non* Explain *Pourquoi* _____

Date – *Date*	Signature – *Signature*

(MP 2591 (4 80) (UIC 10 20)

Employment and Immigration Canada | Emploi et Immigration Canada

EMPLOYMENT QUESTIONNAIRE
QUESTIONNAIRE CONCERNANT L'EMPLOI

Family Name - *Nom de famille*

First Name – *Prénom*

Social Insurance Number
Numéro d'assurance sociale

AS YOU HAVE STATED THAT YOU ARE NOW ENGAGED IN ANOTHER OCCUPATION OR BUSINESS, IT IS NECESSARY THAT YOU PROVIDE ADDITIONAL INFORMATION CONCERNING YOUR ACTIVITIES. PLEASE COMPLETE THE SECTION BELOW AND RETURN IT WITHOUT DELAY.

COMME VOUS AVEZ DÉCLARÉ AVOIR UNE AUTRE PROFESSION OU UN AUTRE COMMERCE, IL NOUS FAUT DES RENSEIGNEMENTS ADDITIONNELS SUR VOTRE ACTIVITÉ. VEUILLEZ RÉPONDRE AUX QUESTIONS CI-DESSOUS ET NOUS RENVOYER CE FORMULAIRE LE PLUS TÔT POSSIBLE.

1. What is the nature of your occupation or business? – *Quelle est la nature de votre profession ou de votre commerce?*

2. Are you self-employed? *Travaillez vous pour votre propre compte?*
   ☐ Yes *Oui* ☐ No *Non*

   If "No", please give name and address of employer
   Si "non", donnez le nom et l'adresse de votre employeur

3. Does your employer control your working hours? – *Votre employeur fixe-t-il vos heures de travail?*

4. What days of the week do you normally work?
   Quels jours de la semaine travaillez vous normalement?

   Total days *Nombre total de jours*

5. How many hours per day do you work?
   Combien d'heures par jour travaillez vous?

   Are you working these hours now?
   Travaillez-vous ce nombre d'heures actuellement?

6. How are you paid? – *Comment êtes vous rémunéré?*
   ☐ Hourly *A l'heure* ☐ Salary *Sous forme de salaire* ☐ Commission *Sous forme de commission* ☐ Contract *A forfait* ☐ Other (explain) *Autrement (expliquez)* _____

7. Are you paid in any other way than by money?
   Recevez vous une rémunération autre que monétaire?

   What are your gross earnings? – *Quel est votre revenu brut?*
   $ _____ Per *Par* _____

8. Describe the nature of your equipment, and/or premises used to carry out this occupation or business.
   Décrivez l'outillage, l'appareillage et les locaux nécessaires à votre profession ou à votre commerce

Employment and Immigration Canada | Emploi et Immigration Canada

TRAINING COURSE QUESTIONNAIRE

QUESTIONNAIRE TOUCHANT LES COURS DE FORMATION

Name — *Nom*

Social Insurance Number — *Numéro d'assurance sociale*

You have informed us that you are attending or plan to attend a course of instruction. In order to determine your eligibility for unemployment insurance benefits, please provide us with the information requested below and return without delay in the enclosed pre-addressed envelope. Failure to return this form properly completed may delay your claim or disentitle you from receiving benefits.

Vous nous avez informé que vous suivez ou envisagez de suivre un cours de formation. Afin de déterminer votre admissibilité aux prestations d'assurance-chômage, veuillez nous donner les renseignements demandés ci-dessous et nous retourner ce formulaire sans tarder dans l'enveloppe ci-jointe. Ne pas retourner le formulaire risquerait de retarder l'établissement de votre période de prestations ou de vous rendre inadmissible à celles-ci.

1 Please give a brief description of the course — *Prière de donner une description sommaire du cours*

2 a) Name of the course — *Titre du cours*

b) Starting date of course — *Date du début du cours*

c) Duration of course — *Durée du cours*

d) Personal cost (tuition, course material) — *Frais personnels (scolarité, matériel d'enseignement)*

3 a) Name of school or institution — *Nom de l'école ou de l'institution*

b) Address — *Adresse*

4 In your view, will this course help you find a job? — *Croyez-vous que le cours vous aidera à trouver un emploi?*

☐ Yes — *Oui* ☐ No — *Non*

If yes, please explain — *Dans l'affirmative, précisez*

8. Describe the nature of your equipment, and/or premises used to carry out this occupation or business:
Décrivez l'outillage, l'appareillage et les locaux nécessaires à votre profession ou à votre commerce.

What is its value?
Quelle en est la valeur?
$

9. Is your present employment normally your principal means of livelihood?
Votre emploi actuel est-il normalement votre principal gagne-pain?

Are you trying to make it into your principal means of livelihood?
Essayez-vous d'en faire votre principal gagne-pain?

10 How long have you been carrying on this occupation or business? -- *Depuis combien de temps exercez-vous cette profession ou ce commerce?*

11. Does anyone assist you with this work?
Quelqu'un vous aide-t-il dans votre travail?
☐ Yes *Oui* ☐ No *Non*

If "yes", explain:
Si "oui", expliquez.

12 Are you prepared to accept other employment?
Êtes-vous disposé à accepter un autre emploi?
☐ Yes *Oui* ☐ No *Non*

If "no", explain:
Si "non", expliquez:

13. If "yes", are you prepared to accept — *Si "oui", êtes-vous disposé à accepter:*

(Check one or both)
(Cochez l'une des cases ou les deux)

A) ☐ Part-time employment?
Un emploi à temps partiel?

B) ☐ Full-time employment?
Un emploi à plein temps?

PURSUANT TO SECTION 55 OF THE UNEMPLOYMENT INSURANCE ACT, 1971.
EN APPLICATION DE L'ARTICLE 55 DE LA LOI DE 1971 SUR L'ASSURANCE-CHÔMAGE

Information collected on this form might be used for the application of employment and benefit programs. Its collection is authorized by the Unemployment Insurance Act. For more details on the uses and rights concerning inspection and correction of the information, refer to the Federal Information Bank Index available at post offices and most libraries.

Les renseignements recueillis sur ce formulaire peuvent servir à l'exécution des programmes d'emploi et de prestations. La Loi sur l'assurance-chômage autorise la collecte de ces données. Pour obtenir de plus amples renseignements sur les utilisations et les droits concernant la vérification et la correction des données veuillez consulter le Répertoire de la banque fédérale des données dans les bureaux de poste et la plupart des bibliothèques.

I DECLARE THAT THE INFORMATION PROVIDED TO THE ABOVE QUESTIONS IS TRUE. I AM AWARE THAT PENALTIES ARE PROVIDED FOR MAKING FALSE STATEMENTS.

JE DÉCLARE QUE LES RENSEIGNEMENTS DONNÉS CI-DESSUS SONT EXACTS. JE SAIS QUE TOUTE FAUSSE DÉCLARATION EN TRAÎNE DES PÉNALITÉS.

Date	Area code *Code régional*	Telephone — *Téléphone*	Extension *Poste*	Signature

Canada

5 INDICATE THE DAYS AND TIMES YOU ATTEND CLASSES *INDIQUEZ LES JOURS ET LES HEURES OÙ VOUS SUIVEZ VOTRE COURS*	DAY — *JOUR*	FROM — *DE*	TO — *A*	DAY — *JOUR*	FROM — *DE*	TO — *A*
	☐ Monday *Lundi*			☐ Thursday *Jeudi*		
	☐ Tuesday *Mardi*			☐ Friday *Vendredi*		
	☐ Wednesday *Mercredi*			☐ Saturday *Samedi*		

6 Are you available for work while attending this course? ☐ Yes *Oui* ☐ No *Non*
Pouvez vous travailler pendant la durée du cours?

If yes please complete the following — *Dans l'affirmative, veuillez remplir la partie suivante*

INDICATE THE DAYS AND TIMES YOU WILL BE AVAILABLE TO WORK WHILE ATTENDING THE COURSE *INDIQUEZ LES JOURS ET LES HEURES OÙ VOUS SEREZ DISPONIBLE POUR TRAVAILLER TOUT EN SUIVANT VOTRE COURS*						
	☐ *Monday* *Lundi*			☐ *Thursday* *Jeudi*		
	☐ Tuesday *Mardi*			☐ Friday *Vendredi*		
	☐ Wednesday *Mercredi*			☐ Saturday *Samedi*		

7 Can your schedule of courses be changed if work becomes available? ☐ Yes *Oui* ☐ No *Non*
Votre calendrier de cours peut-il être modifié si on vous offre un emploi?

8 Would you be willing to leave the course if suitable employment were found? ☐ Yes *Oui* ☐ No *Non*
Seriez-vous prêt à abandonner le cours pour accepter un emploi qui vous convient?

Should there be any change to the above information please notify this Office The enclosed booklet "Your Report Card" provides information regarding the completion of the report cards while attending school or a course

Toute modification des données précitées doit être signalée à votre Centre d'emploi du Canada Vous trouverez dans la brochure Votre Carte de déclaration ci-include des renseignements sur la façon de remplir les cartes de déclaration pendant que vous fréquentiez l'école ou suivez un cours

Date _____ Signature _____

Information collected in this form might be used for the application of employment and benefit programs This collection is authorized by the Unemployment Insurance Act 1971 For more details on the uses and rights concerning inspection and correction of the information refer to the Federal information bank Index available at Post Offices and most Libraries

Les données recueillies dans le présent formulaire, en vertu de la Loi de 1971 sur l'assurance-chômage peuvent servir à la mise en œuvre de programmes d'emploi ou de prestations Pour de plus amples renseignements sur l'utilisation des données personnelles vous concernant, ou sur votre droit de les voir ou de les modifier, veuillez consulter le répertoire des banques fédérales de données dans les bureaux de poste et la plupart des bibliothèques

PLEASE QUOTE YOUR SOCIAL INSURANCE NUMBER ON ALL CORRESPONDENCE
PRIERE DE RAPPELER VOTRE NUMERO D'ASSURANCE SOCIALE SUR TOUTE CORRESPONDANCE

EMP 3141 (6 82) UIC 11 56

Canada

APPENDIX D:

SAMPLE OF A COMPUTER-GENERATED APPLICATION FORM

(12:50-13: 2) 15/ 8/1989

PERSONAL INFORMATION
S.I.N. : [redacted]
Date of Birth: 03-07-45
Name: GILBERT , MARGARET L. Sex: F
Address: 456 MAPLEWOOD AVE Apt. # 12
OTTAWA ONTARIO
K3M4N5,
Mailing: 89 CARLING Apt. #
OTTAWA ONTARIO
K1M4N5,
Tel. (613)748-8388 2nd tel. (613)965-5788
Income Tax Exemption: Basic with Spouse
Children Under 18: 1 Children over 18: 2

PREVIOUS CLAIM
Claim in past 52 weeks? N At which C.E.C.?

EMPLOYMENT HISTORY
Last employer: BEST COMPUTERS LTD.
Employer's
Address: 405 ROCKWELL ROAD Suite 3000
OTTAWA ONTARIO
K1M4N5,
Work Location
If Different: Suite

Last Employer's Tel. (613)876-7780
Employee No.
Title: SALES REPRESENTATIVE
Duties: IN CHARGE OF RETAIL SALES AND CORPORATE ACCOUNTS

Reason No Longer Working: Laid off
Explain:

Union:

First Day:05-06-80
Last Day worked:30-07-89
Will you be recalled? N
Recall date: --
Explain Gap:

Gross Normal Earnings: $ 00540.00 per week
Normal Weekly Hours: 40.00
Gross Earnings for Last Week:$ 00540.00
Vacation Pay: Y
Amount:$ 00575.00
Monies? Y
Types of Monies: COMMISSION

Amount:$ 00230.00

CURRENT EMPLOYMENT STATUS
Self-employed?: N
Working for employer?: N
Job started: --

FARMING	STUDENT/TRAINING	MATERNITY
Farm: N	Student: Y	Maternity: Y

Pension? N

WORK DESIRED
Work Desired: 1. COMPUTER SALES 2. COMPUTER TRAINING
Years of Experience in COMPUTER SALES : 7
Expected Salary in COMPUTER SALES : $ 2750.00
Years of Experience in COMPUTER TRAINING: 0
Expected Salary in COMPUTER TRAINING: $ 2500.00
Ready and Willing to Work? Y
Any Days You Cannot Work? Y
Which Days Cannot Work? Mon
Any Hours Cannot Work? N
Hours Cannot Work:

If unavailable, explain:

If unavailable, give date available: --
Geographical Areas Work Sought: ONTARIO OR QUEBEC

STUDENT
Course Name: BUSINESS MANAGEMENT
Description:
INTRODUCTION TO THE MANAGEMENT OF SMALL BUSINESSES

Date: 16-10-89
Course Length: 6 WEEKS
Fees: $0350.00
School: CARLTON UNIVERSITY
Address:
OTTAWA ONTARIO
K1M4N5,
Will course help find job? N
Explain:

Class schedule:
MONDAY 8:30 - 4:00

Available while attending course? Y
Days and times available while attending:
TUESDAY - FRIDAY

Can you change schedule? Y
Willing to leave course for job? Y

MATERNITY
Expected Date of Birth: 30-12-89
Actual Date of Birth: --

APPENDIX E:

ATTITUDE QUESTIONNAIRE

QUESTIONNAIRE FOR COMPUTER APPLICATION FOR BENEFITS

Instructions: Please answer each of the questions by marking an X in the area corresponding to your answer. Thank you for your participation.

What is your mother tongue?

English ___ French ___ Other ___

Sex : Male ___ Female ___

Is this your first time applying for benefits?

yes ___ no ___

Have you used a computer at work?

yes ___ no ___

Do you use a computer at home?

yes ___ no ___

Have you ever used a "touch screen" like the one you used here?

yes ___ no ___

TURN TO THE NEXT PAGE . . . .

Directions: Rate the following statements by circling the number that corresponds to your response.

My typing skills are:	-2 poor	-1 fair	0 average	+1 very good	+2 excellent
The application was easy to use.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I would use this application again.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
It is a good idea to apply for benefits with the computer.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I liked using the computer application.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I liked using the computer application more than I like to fill out paper forms.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
Overall, this application is a good idea.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
The application includes all of the instructions necessary to use it.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
The instructions were clear.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree

I was able to correct and change my answers easily.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I had difficulty using the computer.	-2 always	-1 sometimes	0 I don't know	+1 rarely	+2 never
The examples provided in the application were helpful.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
Applying on paper is easier than applying with the computer.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
It takes longer to apply with the computer than forms.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
Touching the screen was an easy way to answer questions.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I liked the combination of typing and touching the screen.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I would have liked more instructions.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
I did not know when to touch the screen and when to type.	-2 always	-1 sometimes	0 I don't know	+1 rarely	+2 never
The wording of the questions was confusing.	-2 always	-1 sometimes	0 I don't know	+1 rarely	+2 never
The display was clear and the text was easy to read.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree

The visual presentation maintained my interest.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
Color was used appropriately.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
Sound was used appropriately.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree
The graphics were well-designed.	-2 strongly disagree	-1 disagree somewhat	0 I don't know	+1 agree somewhat	+2 strongly agree

What did you like **best** about the computer application?

_____

_____

What did you like **least** about the computer application?

_____

_____

What difficulties, if any, did you experience?

_____

_____

_____

In order to improve the computer application, your comments and/or suggestions would be appreciated.

_____

_____

_____

APPENDIX F:

SAMPLE DESCRIPTION

Mother Tongue: English 55% French 36% Other 9%

Sex: Male 27% Female 36%

First time applicant? yes 27% no 73%

Used a computer at work: yes 18% no 82%

Uses a computer at home: yes 18% no 82%

Has used a touch screen before: yes 18% no 82%

Occupations: assistant front office manager
violin maker
stock room clerk
grocery clerk
electrician
meat packer
labourer
cashier
tax policy officer
assistant manager
error inspection examiner

APPENDIX G:

SUMMARY OF RESPONSES

TO QUESTIONNAIRE

	Percentage of Respondents				
	strongly disagree	disagree somewhat	I don't know	agree somewhat	strongly agree
1 The application was easy to use.	0	0	0	18	82
2 I would use this application again	0	0	0	9	91
3 It is a good idea to apply for benefits with the computer.	0	0	0	18	82
4 I liked using the computer application.	0	0	0	18	82
5 I liked using the computer application more than I like to fill out paper forms.	0	9	0	0	91
6 Overall, this application is a good idea.	0	0	0	9	91
7 The application includes all of the instructions necessary to use it.	0	18	0	18	64
8 The instructions were clear.	0	0	0	9	91

	Percentage of Respondents				
	strongly disagree	disagree somewhat	I don't know	agree somewhat	strongly agree
9 I was able to correct and change my answers easily.	0	0	0	27	73
10 The examples provided in the application were helpful.	0	9	27	9	55
11 Touching the screen was an easy way to answer questions.	0	0	0	9	91
12 I liked the combination of typing and touching the screen.	0	0	0	18	82
13 The display was clear and the text was easy to read.	0	0	0	9	91
14 The visual presentation maintained my interest.	0	0	0	9	91
15 Color was used appropriately.	0	0	9	18	73
16 Sound was used appropriately.	0	9	0	27	64
17 The graphics were well-designed.	0	0	0	0	100

APPENDIX H:

SAMPLE OF USERS' COMMENTS

What did you like best about the computer application?

- I found it faster, straightforward & easier to understand the information wanted.
- easier to deal with machine than person (embarrassment)
- The computer was faster and fun.
- Very easy, just follow steps.
- Quick and less paper work, fun.
- It was simpler, easier. Less reading to do.
- Plus rapide, mieux presenté, moins long à lire.
- Clarity. Overall the instructions were clear and simple. Speed of service should improve.
- User friendly and fast.
- Fast and easy to use.

What did you like least about the computer application?

- Étant donné, qu'elle porte des verres de contact, des couleurs foncées sont dures pour les yeux, plus difficile à lire.
- To add sub information on application and screen. Questions on normal salary not clear -- they are on two screens -- should be on one.
- some lack of detail in instructions
- Combination of touch and type was somewhat confusing.

<u>What difficulties, if any, did you experience?</u>

- was confused on when to press enter & when to press the touch box
- understanding how to correct
- answered wrong, and could not change my answer
- to correct errors to find the proper key to use
- Lorsque le fond de l'écran est foncé c'est plus difficile à lire
- only those related to above question (some lack of detail in instructions)
- remembering whether to touch or type some answers

<u>In order to improve the computer application, your comments and/or suggestions would be appreciated</u>

- I think filling out this information on a computer rather than paper is much more appealing.
- allow for easier corrections
- years of experience should be years or months of experience
- easy to use
- if answered wrong you should be able to change your answer
- allow to go back to previous screens in order to correct possible errors. When reason for separation is

maternity, sickness, adoption, paternity the section "Work Desired" should not be completed

- so far it looks great

APPENDIX J:

LIST OF TECHNICAL MODIFICATIONS

- Questions involving amount of pay and period (eg. weekly) were reworded and the order was reversed for clarification.
- For years of experience in work desired, a decimal was added for partial year/less than one year of experience.
- Slight changes were made to several questions such as "touch one" and "press enter".
- For monies received other than vacation pay, "besides money" was changed to "besides vacation pay".
- Various French sentences were reworded.
- For union name and employee/payroll number questions, "If not applicable, just press Enter" was added.
- On several screens, "I don't know" was not functioning. This was corrected.
- Questions asking for home phone number and for second phone number were reworded to encourage claimants to enter their area code first.
- Yellow highlighting was altered on several screens, either adding it to emphasize a key word, or removing it where it was distracting.
- Print units were corrected to ensure that all variables which were answered by claimants printed out.