CIS: A NEW FRONTIER FOR MIS

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The era of customer service is seeing the development of a new branch of management information systems — consumer information systems (CIS). The CIS is fast becoming the source of intelligence on all consumer issues in customer-oriented firms. The authors outline the main characteristics of CIS, and relate them to the development of the consumer affairs role in business. Technological aspects of the CIS are also discussed.

Keywords: Consumer, customer, information, systems, technology.

INTRODUCTION

Consumer Information Systems (CIS) are evolving as a new frontier of Management Information Systems (MIS). The emergence of the CIS has been the result of demand side pressures and supply side developments. Demand pressures are derived demands, resulting from the rapid growth of consumer affairs departments in business and government. Supply developments are on offshoot of technological developments in communications and computers.

Consumer affairs departments by whatever name (Consumer Affairs, Customer Service, Customer Relations) emerged in the 1960s in the United States, primarily as a response to the so-called 'consumerist critics' of the corporate sector. Faced with criticisms related to their products and services, companies created departments whose initial task was to meet and hopefully divert these criticisms.[1] From these early experiments, it emerged that consumer affairs departments had a more permanent role to play within the organization by providing intelligence on consumer matters and giving advice on policy related to the consumer.[2]

The rise of consumer affairs departments during the 1970s and 1980s in the US has been dramatic. It is best illustrated by reference to the growth in membership of the Society of Consumer Affairs Professionals (SOCAP), a professional association formed in 1973 by people who worked in consumer affairs departments. From 100 member companies in 1973, SOCAP grew to over 1,000 member companies in 1991. SOCAP branches exist in parts of Europe and the Pacific Rim. A branch has recently been formed in Australia, and companies such as QANTAS, Commonwealth Bank and Nestle have instituted consumer affairs departments.

The goal of contemporary consumer affairs departments is pro-active; the maximization of customer satisfaction. The link between customer satisfaction and corporate profitability translates satisfaction into a bottom-line benefit for the organization.[3] The need for pro-active, quantitative presentation of intelligence on consumer matters and the contribution of consumer affairs to the bottom-line created the pressure

for CIS — computerized systems for logging incoming data from customer communications and transforming them into actionable information for corporate decision-making.[4]

There has been additional demand-side pressure of late for CIS in Europe, as a result of legal developments concerning product liability and product safety in the European Community.[5] A proposed directive on product safety, which is likely to be effective by 1993 requires that companies be obliged to monitor the safety of products. Monitoring would involve marking product-lots for identification purposes, testing samples of products, and implementing systematic procedures for assessing and investigating complaints by users of the products. These are precisely the kinds of uses to which CIS have been applied within consumer affairs departments.

Supply side developments that lead to CIS followed the development of toll-free telephone lines for customer communications.[6] The so-called '1-800' numbers have become so common in the US that they are now expected by consumers as part of the delivery of consumer goods and services. Telephone systems have limited analytical capabilities, however, and the potential was there for the development of CIS software packages that can log and retrieve the in-coming communications, and transform them into actionable information. Software to handle 800 line data is now offered by a number of specialist companies, and user-specific systems have been developed by internal MIS departments at many sites.

In what follows, the present authors would like to demonstrate that CIS is a subset of MIS, and in so doing give a detailed review of the current state of CIS. Starting with a definition of MIS, we will introduce four general dimensions of MIS, and then specify these dimensions for CIS. This task is an important one: it is our opinion that CIS will become so much a part of organizational operations as MIS in the future, that the reports generated by CIS will be as necessary to corporate decision making as the more familiar data on financial performance of the firm.

MIS AND CIS

A widely-accepted definition of MIS is the following:

> An integrated, user-machine system for providing information to support operations, management, and decision-making functions in an organization. The system utilizes computer hardware and software: manual procedures; models for analysis, planning, control and decision making; and a data base.[7]

This definition outlines both the constituent elements of MIS (hardware, software) and its functions. The present authors discern four dimensions to MIS. First, there is the technical dimension, which consists of the

physical elements required to set up a system. Second, there is the data dimension, which focuses on the kind of data gathered and stored in a database. Third, there is the functional dimension, which emphasizes the functions that the system can support. Finally, there is the performance division, which focuses on how well the system does its job. The four MIS dimensions will now be described in detail, and it will be shown how CIS incorporate them.

THE TECHNICAL DIMENSION

The technical dimension consists of several elements, namely (1) computer hardware for collecting, processing, storing and communicating information; (2) software for running the system and its required application; (3) a database for storing information; (4) procedures (manuals and instructions) for effective operation of the system and its applications; and (5) operating personnel for preparing data, systems analysis etc.

The five elements are essential to CIS also. A networked system of individual terminals is required so that consumer affairs personnel can log data as they receive it from customer-initiated telephone calls or letters. Software to trap data can be created or acquired from the newly-emergent specialist companies. The information is added to an ongoing database as each communication with the consumer is completed. User-specific operator and supervisor manuals support the training of operatives in the use of the system.

In the early days of CIS, the system was usually created by MIS personnel on a custom-built basis. The choice today is to have MIS build the system or buy a system from one of the specialist companies that market CIS software, advise on hardware requirements and train customer service representatives in the use of the system. The number of these specialist companies is growing: a recent publication from SOCAP reviewed the products of 13 such companies operating in the US.[8] The decision to build or buy is essentially a trade-off between a proven prepackaged product and the idiosyncratic requirements of the particular company.[9]

The technical requirements depend to a large extent on how well-rounded is the consumer affairs department. The well-rounded department will aim at being the source of intelligence on all issues and policies involving the consumer.[10] It will collect information from consumers through incoming communications (phone calls, letters, comment cards), through company-initiated efforts (focus groups, surveys), and through the acquisition and analysis of external data sources (official statistics, private consultants, data from other departments in the corporation). CIS technology will need to be capable of integrating the various data sets acquired and capable of processing them into information for decision-making.

THE DATA DIMENSION

Of the many sources of data available to the CIS, the prime source is incoming communications from customers. These communications keep the company appraised of the current satisfactions levels of consumers, and alert the company to any developing crises. For example, a sudden spate of calls from one region of the country may indicate that there is a bad batch of the product, and action can immediately be initiated to recall the batch. The savings in company reputation and possible legal costs of such action represent a bottom-line benefit for the CIS.

The data task for CIS is to capture the incoming communications as they arrive at the company, and simultaneously enter them into the CIS. This requires the development of a coding scheme for data, and its embodiment in a series of computer screens.

Most CIS software adopts a decision-tree approach to coding data, whereby the customer service representative who is handling the communication will follow the appropriate path to final data entry. A typical path might be: Is the communication a complaint, inquiry or suggestion? If a complaint, which product is it about? What model of the product? What exactly was the complaint? Alternative answers to the question will appear on the screen at each stage. When the representative reaches the end of the path, a code number representing the path will be entered into the database. The main screen will also have fields for required supplemental data, such as the customer's name and address, who handled the call, and so on.

Of course, not all communications will necessarily fit the predesigned coding scheme. Because of this, it is common to have a special field or separate screen for verbatim entry of consumers' comments. Recent developments in analysis of verbal data, such as content analysis, make it possible to do supplemental analysis on these kinds of data.

There is even the possibility of basing the entire coding procedure on the verbal string approach, as opposed to the decision-tree approach. Thus, the representative will be presented 'pick from' lists, which can subsequently be arranged in an order which enables the communication to be captured for report purposes. For example, with a list of models, products, and common complaints to pick from, a communication from a consumer can be reported in the following form: "The (model) of our (product) was found to have (complaint)." Counts of frequencies of entries from the lists convert these verbal strings into quantitative data. Additional information such as customer's name and address can extend the reported sentences.

The ability to capture incoming communications, combine them with other available data sources about the consumer, and convert the data into information through analysis and report writing characterizes the modern CIS. Software requirements extend to the incorporation of word processing, data based management and statistical analysis. Commercial producers of CIS will usually subcontract with producers of other software producers for these requirements.

THE FUNCTIONAL DIMENSION

CIS functionality may range from simple transaction processing such as generating response letters to complicated 'what if' analysis for planning. A recent study jointly undertaken by SOCAP and TARP in 1988[11] revealed a wide variety of Consumer Affairs activities which are supported by CIS: generating summary reports (90 per cent), classifying contacts by product or problem type (74 per cent), logging customer identification information (72 per cent), direct entry of customer contact at time of call (58 per cent), word processing (50 per cent), access to an information base (44 per cent), access to a database to tell customers where to buy (22 per cent). These activities can be grouped into the following Consumer Affairs functions.

Planning

An organization may want to install a toll-free telephone system and advertise this through an extensive campaign. If the contact volume increases as the result of installing the system then this will in turn influence the number of satisfied complainants, the costs per complaint, personnel training costs and the return on investment for Consumer Affairs in general. Computer-based simulations of the effects on the variables that were mentioned above allow for a fast evaluation of planning and may facilitate Consumer Affairs decision-making. On a different level a CIS may be used, for instance, relating the costs of each legal claim to the cost of the various stages of arbitration, indicating at which point it will be most advantageous for the company to settle.[12]

Data processing

According to SOCAP/TARP[13] CIS are predominantly used for Consumer Affairs data processing. With respect to the entering of customer data, validation of input can be achieved by indicating mandatory fields which have to be entered before cases can be closed. In this way uniform data can be gathered despite often multi-user input.[14] Moreover, a CIS can be used to screen customer data accurately. Previous contacts can be traced through the use of matchkeys (consisting of for example postal codes and house numbers). In this way repeat complainers can also be identified.[15] Another screening function of CIS is tracking contact status as to whether cases are closed or not[16] and whether set response dates are met.

As far as classification of customer data is concerned a CIS permits fast and very detailed coding of each contact.[17] Furthermore, after a contact has been classified according to a certain code, the CIS may display pre-set responses and procedures referring the Consumer Affairs representative to other departments within the organization. Automatic response and procedure display can be especially useful when severe

problems requiring immediate action occur. Finally, for purposes of data analysis, CIS allow for quick frequency analysis and cross tabulation of any codable data field.

Communicating information

A CIS can also automate part of the communicating information function of Consumer Affairs. Standard and *ad hoc* reports can be generated containing tabular or graphical material, index numbers, etc., tailored to the needs of various groups of internal customers. Part of the communication with external customers can be automated as well. Standard response letters (personalized by complainant's name and address), cheques, coupons or other paper forms of recompense can be generated by the CIS.[20] Some CIS allow users to specify a packing list of enclosure items to be sent to the customer. This is especially useful when other departments in the company are involved (for instance, when Distribution should send the customer a product replacement). Finally, access to in-company databases (e.g., product or distribution channel information) may speed up the communication of the information to the internal customer.

As regards internal customers, the communications need is to present and interpret the information contained in the database for the appropriate level of management. This may require some statistical analysis, such as presentation of frequency distributions or cross-tabulations. There may also be supplemental investigation of significant findings, such as the tracking of complaint frequencies for particular product lines. Most commercial CIS software packages incorporate basic statistical procedures and report writing capabilities, to help facilitate these tasks.

Control

A CIS can also be used to support the control activities of the Consumer Affairs department, in order to see whether predetermined standards are being met. The CIS can provide the department's manager with information on the response time, volume and type of work done by representatives. Furthermore, CIS can be used for drawing samples of customer contact cases for satisfaction and loyalty surveys among customers, and these ratings are then in turn used for assessment of representative performance.[18]

THE PERFORMANCE DIMENSION

Within the performance dimension four major aspects can be discerned in relation to CIS.

Speed

An important performance aspect of CIS is speed, because it is often used in combination with an on-line telephone system. Help menus or so-called 'pop-up windows' allow the users to quickly capture customer data, while on-line access to in-company databases can permit a fast answer to a where-to-buy question or a request for product information.

Security CIS, even more so than MIS, often contains confidential information, from the perspective of the organization as well as the customer. A second performance aspect, therefore, is the possibility to secure the data at several levels (data entry, analysis, backup, etc.) within the system.

Flexibility

A third performance aspect is flexibility. For instance, it has been found that dissatisfied customers first state either their problem, the product to which the problem refers, or the name of the employee that was responsible for the complaint before giving their full address or home and work telephone number. Therefore, it is important that the CIS allows for flexible data capture. Flexibility is also important with respect to durability of the coding structure. Whenever a new product is marketed, a new communication campaign is started or when a new problem area arises, the coding structure of CIS must be able to incorporate these new developments. Flexibility of data analysis is vital to the use of consumer information within the organization. Company management as internal users of the information should be able to adopt a pro-active role in requesting information, for instance for test marketing of a new product, or for trend analysis.

Integration

A final performance aspect is the level of integration of CIS within company MIS for exchanging information and standard packages such as spreadsheets, statistical analysis, graphical and work processing programs.

CASE DESCRIPTION: A CUSTOMER INFORMATION SYSTEM IN PRACTICE

The company is a Los Angeles based company that specializes in quality and premium priced skin and hair care products. Customer contacts were first handled manually and with the help of a word processing package. In 1987, as the number of customer contacts continued to rise and even the use of a word processor seemed time consuming, a CIS was implemented.

Technical dimension

The CIS runs on a four-user PC network served by a fileserver. The software was purchased from a company specializing in CIS. Although it is possible to interface the system with other incompany databases, this has not been realized due to different hardware configurations. At the moment the Consumer Affairs department is building up a product information database within the system.

Data dimension

Unique customer data that can be registered by the system include account number, name, address, phone number (home and at work), the date on which a problem occurred, the department the case has been referred to, the date on which this department's response is due, the date at which the response was recorded, and the amounts of cheque or coupons that may have been sent to the customer.

As far as coded data are concerned, the classification system distinguishes between initial and last Consumer Affairs representative, for in a later state different reps may close the case. Other coded data include method of contact, descriptions for contact, type of contact, reason for contact, the department and person within the company to which the case is referred and the size of the product. Although only 8 coded categories are being used the system has the possibility for as many as 24 categories. Furthermore, within each category four levels of coding can be used each of which has the capacity of 1000 codes. Within the category product, the coding structure differentiates between the company's soaps, acne care, facial care, body care and hair care products. In turn each of these product groups is divided into a large number of the company's products. In addition to coded and non-coded data, various types of verbal comments of consumers can be entered into the system.

Functional dimension

As far as data processing is concerned, the system offers a large variety of functional features: flexible data entry, customer history tracking, case status, frequency, cross tabular and normalized analysis, verbatim analysis, listing of open and closed cases. Because there is a high interest within the company in customer comments the firm is presently experimenting with a new data analysis technique, the crosstabular verbatim analysis. This allows the Consumer Affairs department to analyze qualitative data in a more quantitative way, by listing, for instance, all verbal comments relating to reason for contact by product group or method of contact. As yet, the information is not used in the planning process of the department other than for establishing trends in the volume of contacts.

With respect to communicating information to consumers, approximately 300 standard as well as customized letters can be generated by the system. The use of a particular code for product and reason for contact automatically triggers a suggestion for the appropriate standard letter. Similarly, standard as well as *ad hoc* reports can be produced with the help of the system.

Because of the nature of the product, the company receives many requests for product samples. In order to efficiently deal with this, the CIS automatically generates a packaging list which indicates which products in what quantities should be sent to the customer. The packaging lists are forwarded to the shipping department which can use them as address labels as well.

For control purposes the system enables the Consumer Affairs department to calculate the volume of the data being processed. In addition, the system is used to guard response deadlines, and listings of cases that are still open are produced on a regular basis. Although there is the possibility of calculating the average response time per representative, this feature is not used because the manager of the department is of the opinion that the quality of the response is more important than the actual time it takes to respond.

Performance dimension

The CIS functions fast enough to be used in an on-line telephone situation. Moreover, the explanations of the many codes that are part of the system are readily available by means of pop-up help windows. Despite these facts some representatives put the data on pieces of paper first before entering it into the computer. This inefficient way of working is often attributed to a computer shyness that is especially prevalent with older representatives.

The system is secured at various points by passwords. For instance, the addition of new codes can only be performed by the Consumer Affairs manager and an analyst. Maintenance of the coding structure is easy, new codes can be added or deleted instantly, allowing for flexibility. Another performance feature of the system concerns flexible data entry and selection of data for analysis. The system is interfaced with word processing and graphical packages.

The Consumer Affairs department is striving to achieve a high-tech image in the eyes of company management and recognition of professionalism, yet the department does not want to create such an image in the eyes of the customer. The customer needs to feel the personal touch.

As an addendum to this section, the Consumer Affairs manager was asked to rate the level of achievement of the CIS with respect to certain attributes of efficiency and effectiveness, on the following scale: + + = very much so, + = yes, +/- = neutral, - = no:

Attribute	**Rating**
Reduced overhead costs	–
Reduced costs for warranty, repair and complaint handling	–
Reduced legal costs	+
Higher labour productivity	+
Shorter processing times	+
Increase in data handling capacity	+
Better use of internal information processing	+/–
Constant and predictable quality of data processing	+
More detailed analysis	+
Increased flexibility	+
Professional ('high tech') image in the eyes of internal customers	+
Professional ('high tech') in the eyes of external customers	–
Customer responsive image in the eyes of consumer organizations/government	–
Higher satisfaction levels customers	+
Elimination of repetitive and tedious tasks	+
Higher job satisfaction	+

With respect to departmental costs, it was remarked that the work load has been steadily increasing, so that it is difficult to state the cost reduction attributable to the CIS.

CONCLUDING COMMENTS

It is the era of customer service. The gospel according to Peters and the writers in the excellence tradition is that the company that listens to its consumers has the competitive edge.[19] The technology (hardware and software) that enables a company to listen to its consumers and convert the messages into actionable information has already been developed in the US, and CIS is spreading rapidly to other parts of the world. It is in Australia too, having been carried there by Quantas airlines, among other companies.

The conceptual basis of CIS lies in MIS, as we have attempted to show in this article. CIS is developing a life of its own, however, and in some cases is confronting MIS on its own ground. At General Foods USA, for example, the CIS center has become a profit center, contracting with other divisions of the company to supply intelligence on customer-related matters. CIS is also entering the curricula of colleges and universities,[20] and efforts at developing professional standards for the fields are being made.[21]

In the above, wo have portrayed CIS as a frontier of MIS. There is, in our view, potential for widespread development along that frontier. It remains to be seen whether and to what extent that development will

take place. Much depends on the ability of the consumer affairs departments themselves to convince upper management that they contribute to the bottom-line. There has been a tendency in the past for expenditures related to the consumer to be regarded as a luxury. To combat this attitude, consumer affairs department must be their own internal public relations brokers, continually reminding the organization of their worth.

Notwithstanding the caveat of the previous paragraph, CIS is an idea whose time has come. This should come as no surprise, given the nature of the beast as described above. The technology requirements dovetail neatly with recent developments in communications and computers, and the information generated provides the insight necessary to keep abreast of the rapidly changing consumer society. The question for companies is no longer whether they should have a CIS, but how long can they be expected to survive without one.

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