Management control system of infosys pdf

Advances in data-based information technology in recent years have led to a wide range of systems that managers now use to make and implement decisions. By and large, these systems are developed from scratch for specific purposes and differ materially from standard electronic computing systems. Too often, unfortunately, managers have little to say in the development of these decision-making sysems; At the same time, non-managers who develop them have a limited view of how they can be used. Despite these disadvantages, the author found that a number of the 56 systems he studied are successful. And the difference between success and failure is the extent to which managers can use the system to increase the efficiency of their organizations. Thus, the author suggests that these are the criterion designers and managers should jointly attribute in harnessing the capabilities of today's technologies. What can leaders realistically expect from computers other than a bunch of reports a foot deeply dumped on their desks every two weeks? For example, everyone knows that computers are good at listing receivables. But what about all the promises and speculations of the past few decades about the role of the computer in management? While there have been advances in basic information retrieval, processing and display technology, my recent study of 56 computerized decision support systems confirms the common wisdom that very few management functions have actually been automated to date, and all indications are that most may not be. Instead, my findings show what other researchers have reported: applications are being developed and used to support the leader responsible for making and implementing decisions, rather than replacing him. In other words, people in a growing number of organizations are using what are often called decision support systems to improve their management efficiency.1 Unfortunately, my research also bore out the fact that while more and more practical applications are being developed for use by policy makers, three significant stumbling blocks still stand in the way of others who might benefit from them. First, managers and computer users in many organizations are familiar with only a few of the types of systems that are now in use. As a result, different types of innovative systems have often been conceived and nurtured by internal or external contractors, not by system users or their superiors. Secondly, and closely related to my initial findings, these entrepreneurs tend to concentrate on technical characteristics. Too often, this myopia means that they fail to predict how such systems can be used to increase the effectiveness of individuals in organizations. Finally, highly innovative systems - the very many management should find most useful - run a high risk of never being implemented, especially when the impetus for change comes from a different source than the potential Quite simply, my purpose in this article is to discuss, without getting into the technology involved, the high potential of a variety of decision support systems, the challenges and risks they pose to managers and

implementers, and a wide range of strategies to meet these challenges and risks. Types of decision support systems Although there are many ways to categorize computer systems, it is convenient to compare them in terms of what the user does with them: Retrieves isolated data elements. Used as a mechanism for ad hoc analysis of data files. Retrieves pre-specified aggregations of data in the form of standard reports. Estimates the consequences of proposed decisions. As attachments I indicate, EDP reporting systems usually perform only the third feature of this list of operations, which I have organized along a dimension from data orientation to model orientation. Therefore, unlike the EDP user who receives standard reports periodically, the user of the decision support system usually starts each instance of system usage, either directly or through a staff intermediary. Annex I Comparison of the applications, purposes and characteristics of EDP Systems vs. Decision Support Systems Although decision-oriented reporting systems often grow out of standard EDP systems, I will concentrate on seven different types, briefly describing one example of each type. By the way, it is interesting to note that external consultants developed the systems cited in my second, fifth and seventh examples, while those of the first, third and sixth were creations of people acting as internal contractors through staff roles; only the fourth system was developed on direct missions by the user. The same pattern for initiating innovative systems by people other than users was present in many of the 56 systems. 1. Pick-up only – a retail floor information system. To help production form improve the percentage return on a newly developed 50-step process for the production of microcirceries, the management of one company has installed an on-line, shop floor information system. Operators submit daily work reports, which include returns, release date, identification of the person doing the work, and so on. The foremen then juggle this information to get productivity data by operation, operator, machine and a lot. Thus, they are able to use the system in a variety of ways. They can monitor workflows, find return issues, and determine daily questions such as who worked on which lot when, and which operators are ahead or behind schedule, or below standards. The foremen have 13 standard commands that they can retrieve the data stored in the system and view them at a cathode ray tube terminal. The commands allow them to tailor reports to their needs. 2. Retrieval and analysis – a portfolio analysis system. Before I advise customers or take trading decisions, the portfolio managers in a bank I studied use an on-line system to analyze Portfolios. Managers can bypass time-consuming manual methods and get up-to-date and clearly organized portfolio information in graphical or tabular form. Depending on the situation, a manager can inspect both individual portfolios and groups of portfolios from different points of view, such as rank them in different ways, have breakdowns by industry or risk level, and so on. With this kind of flexibility, the bank's portfolio managers make more efficient use of a huge amount of information, most of which had existed before the system, but had only been available through tedious manual analysis. 3. Multiple databases plus analysis – sales information systems. Greater flexibility was also the reason why two consumer products companies and one manufacturing company I looked at developed sales information systems that are quite similar. Standard EDP features were too inflexible to produce ad hoc sales analysis reports on time and cost-effective for those in the companies' marketing and planning areas. In each case, information obtained from the EDP systems is now maintained separately to have it convenient, and in two cases to be able to analyze it together with remotely purchased proprietary databases and models. Basically, each system is a vehicle in which an employee male or group tries to help decision makers. Their modus operandi is incremental: identifying a problem; bring the current system and existing expertise to bear on it; develop a solution in the form of an analysis or additional system module; and incorporate the results into an extended version of the system. 4. Evaluation of decisions using an accounting model – a source and usage budget. To speed up operational decision-making and financial planning over a two-year horizon, an insurance company uses an online, source-and-application-of-means budget system. Input is estimates of future business levels in different lines of insurance and investment areas, plus assumptions about key figures such as future money market rates. Production is an estimated total cash flow by month. An investment committee uses the model to allocate funds across investment areas and to minimize the amount of cash left inactive in banks. The sample compares expected cash flows based on different allocation decisions; the decisions that it actually adopts are those that produce sufficient expected cash flows and that are acceptable for the different groups in the company. In fact, the system is an accounting definition of the company. There is no doubt about the accuracy of the relationships in the model, so the only way expected results may be incorrect is if estimates of business activity levels or money market rates are incorrect. 5. Evaluation of decisions using a simulation model – a marketing decision system. To provide a more rational basis for repetitive marketing decisions, use a a model that relates to of advertising, promotions and prices at sales levels for a particular brand. The model was developed in a team setting by unperturbing an analysis of historical brand information with a person's subjective feelings about the effect on sales of different levels and types of advertising and other marketing actions. The model was validated by tracking the accuracy of predicting sales based on competitive actions taken. Unlike the accounting model I just mentioned, this is a simulation model where some of the most important relationships are estimates at best. For example, there is simply no rule where it is possible to predict sales with security based on advertising levels. In fact, this was the heart of the problem in the development of the model. Although it has proved useful for prediction, much of the value of the model lies in the company's improved understanding of the market environment. 6. Proposes decisions – optimisation of raw material use. Another consumer product company, which faces short-term supply problems for many of its raw materials, has developed an optimization model to solve the mathematical puzzle of choosing and balancing among various product recipes. The inputs to the model include a variety of different recipes for many products, short-term supply levels for raw materials and production requirements for finished products. Production is the choice of recipes that maximize production with the help of existing supplies. When the short-term supply situation changes, the model can be revised and a new set of recipes selected. The system has had a major impact on how managers view award policies. Initially, they considered allocating scarce raw materials to products by setting priorities among the products. The model showed that it was more advantageous to start with production requirements and then allocate scarce resources by optimizing the mix of product recipes. 7. Make decisions – an insurance renewal system. As an outgrowth of an overhaul of the Group's insurance information system, an insurance company has developed a system to eliminate part of the clerical burden associated with the renewal guarantee and to ensure that the pricing calculations are consistent and accurate. Instead of calculating renewal rates by hand, the guarantors fill out coded input sheets for the system, which calculates a renewal rate based on a number of standard statistical and actuarial assumptions. Since these assumptions may or may not apply to a specific policy, the guarantors review the documentation that comes with the policy and determine whether the standard calculations apply. If they are not, the code sheet is changed appropriately and resubribing. In practice, the system makes the decision in completely standard situations, while the guarantor determines whether the situation is standard and, if not, what adjustments are required. As a result, the guarantors can concentrate on of their jobs instead of the related clergy tasks. Range of possibilities These seven systems represent a wide range of approaches in supporting decision-making. The first helps the productioners by simply providing quick access to historical information such as who worked on what much and when the work was done. But the foremen have to decide what to do when they have the information. At the other extreme, the system supports the guarantors almost making the decision in some cases. Between the two extremes, analysis systems and model-oriented systems help people organize information and also facilitate and formalize the evaluation of proposed decisions. Although managers of most large companies have used budgeting or planning systems similar to the source-and-application-of-fund model I mentioned, the range of options for other types of decision support systems is surprisingly broad. Of course, some of these systems are for no special use in many settings. Nevertheless, their variety suggests that most companies should have a number of real opportunities to use the term computer-based support for decision-making. Motives of managers What do decision support systems do that actually help users? What is their real impact? In my survey, answers to these questions proved elusive in many cases since users valued the systems for reasons that were completely different from initial ideas about what the systems should achieve. In fact, there is a wide range of purposes for these systems. While many decision support systems share the goals of standard EDP systems, they go further and address other managerial concerns such as improving interpersonal communication, facilitating problem solving, promoting individual learning and increasing organizational control. Such systems can influence interpersonal communication in two ways: by providing individuals with tools for persuasion and by giving organizations a vocabulary and discipline that facilitates negotiations across subunitive boundaries. Persuasion Tool Standard texts on system analysis completely ignore the personal use of decision support systems as a tool for persuasion. But consider the following offensive (persuading someone else to do something) uses that various companies have set these systems: The manager of a chemical plant tried to meet production targets (quantities by product) that were set by a marketing group. Unfortunately, the Group set targets without much regard for the raw material shortage under which the plant was operating. The plant had used a model to calculate production mixes. At one point, the factory manager ruled that he could use this model to investigate whether marketing set goals that resulted in poor plant utilization and made him seem ineffective. When he drove the model under a number of different production mix targets, it became clear that this was the case, and he used results to persuade marketing to change the plant's production mix. A data retrieval and manipulation system first gained wide exposure in a transport company when a number of the company's top executives used it to develop a good quantitative justification for a proposed merger. With the system, it was possible to explore and manipulate a large data base of information about the industry. Although the merger was not approved, management believed the system helped set up a good fight. The management of a shipping company found that a system it used in consolidating and fine-tuning strategic investment plans also helped it negotiate with the banks. Banks and other funding sources seemed to be evenly impressed by the cautious computer-based analysis on which management based its funding requests. The resulting edge in credibility was small, but in the opinion of management noticeable. Now that we've seen illustrations of the offensive tools of persuasion, let's turn to examples of the defensive (persuading someone that the user has done a good job) using these systems: When asked if he ever made direct use of a case tracking system, the head of a adjudication group in a state regulatory body said he remembered only one case. This was when he spent a lunch hour generating a report to make the group's recent results seem as favorable as possible despite some unfortunate delays and problems that made the standard report look bad. The new president of a large conglomerate used a one-year budget model to talk about the budget choices that existed, as well as to help him reduce what people in various areas claimed about their own budget needs. The class planner for a training school for a company's service personnel had found the job frustrating because it was always difficult to justify the budget on an explicit basis. With a model that generated optimal training plans, the planner can protect himself very easily by saying: Using these assumptions about attribution, acceptable peak-time deficiencies and other considerations, this is the best budget. If you (the budget cutter) want me to change these assumptions, I would like to generate a new budget. What level of deficiency do you suggest? Thus, the system not only helped the planner make decisions, but also helped him defend them. Many suspected that a new product company in a consumer company might not be worth it, but no one knew exactly why. When a risk analysis was carried out with a model, the reason became clear: the enterprise had a very significant downside risk. In addition to sealing the decision, the analysis provided an understandable response to those who had proposed the venture. A cynic might argue that people in these situations exploited or abused the systems. A more practical conclusion is that these systems only serve to improve managers' efficiency in organizations by helping them communicate with other people. My point is that a lot of the benefit of many of the decision support systems in my test was of this kind. Communication solutions Decision support systems also help managers negotiate across organizational units by standardizing the mechanics of the process and by providing a common conceptual decision-making basis. During the survey, managers often commented that consistent definitions and formats are important means of communication, especially between people in different organizational units, such as divisions or departments. In a number of cases, the development of these definitions and formats was a long and sometimes demanding task that was achieved gradually over several years, but which was also considered one of the most important contributions to the systems. For example, one of the purposes of some of the model-oriented systems in my sample was to estimate in advance the overall result of decisions different people considered separately, by filtering these decisions through a single model. In these cases, the system became an implicit arbiter between different targets for different departments. Instead of arguing from their own divergent views, marketing, manufacturing and financial people can use the model to demonstrate the effect of a group's proposal for another group's actions and on the overall outcome. As a result, questions were clarified and the negotiation process accelerated. The production men I mentioned earlier noted the same type of facilitation. It helped them in work planning discussions and problem surveys by providing immediate access to objective information about who did what, when, and how well on any production lot in the store. Value for the user Although implementers of a number of the successful systems I studied found it necessary to review the movements to present a cost/benefit justification attributable to a dollar value to personal efficiency, they did not believe these numbers more than anyone else did. Management usually decided to continue on the basis that the proposed system seemed to make sense and would likely have a beneficial impact on how people interacted and/or made decisions. Money savings are obviously a very important and worthwhile justification for developing computer systems, but it should be clear at this point that the EDP-style assumption that systems should always be justified in these terms is not enough in the area of decision support systems. Equally obviously there is a clear danger in developing a system simply because some believe it makes sense, especially if someone is not the direct user of the system. In fact, the systems I cited as my first, second and fifth examples began in this way and met resistance until they were moved as something that users want to be more effective. Again, the general problem here is a common for technical people to concentrate on the technical beauty of a system or idea, and to assume that non-technical people will somehow see the light and will be able to figure out how to use the system in solving business problems. This kind of overoptimism was present in the history of almost every failed system in the test. The message is clear: try to take advantage of the creativity of technical experts, but be sure it can be channelled against real problems. The challenge, of course, is how to achieve both of these goals. There are a number of ways, which I will now discuss. Development patterns Despite the common wisdom that users' needs must be considered in developing systems and that users should actively participate in implementing them, users did not initiate 31 of the 56 systems I studied and did not actively participate in the development of 38 of the 56. The results, illustrated in Appendix II, are not surprising. Intended users neither initiated nor played an active role in the implementation of 11 of the 15 systems that suffered significant implementation problems. Conversely, there were relatively few such problems in 27 of the 31 systems where users had a hand in initiating and/or played an active role in their implementation. Exhibit II Systems Resisted by users But it would be wrong to suggest from these findings that systems should be avoided completely, if intended users neither initiate them nor play an active role in their implementation. Firstly, 14 of the 25 systems I studied where this was the pattern was ultimately successful. More importantly, many of the genuinely innovative systems in my sample, including 5 of the 7 that I described earlier, showed this pattern. On the other hand, many of the systems initiated by users do little more than mechanize existing practices. While such mechanization can be very beneficial, and although I certainly do not suggest that major innovations must come from external sources, the real challenge is to be able to use insights regardless of source. One way to do this is to develop an implementation strategy to encourage user involvement and participation through the development of the systems regardless of who came from the concept. Examples of successful strategies follow. Impose gracefully: Marketing and production managers in a decentralized company did not like the extra work (format changes and data submission requirements) needed for an annual budgeting system, which senior management installed. Initially, they were particularly unen enthusiast because they thought the system wouldn't really help them. So at each stage the designers made a point of developing subsystems to provide these middle managers with sales and materials usage information that had never been available. This quid pro quo worked well; instead of seeing the system as a total order, the leader saw it as an opportunity for them to take part in something that would be to them. Run a dog and pony show: Central planning personnel in two companies designed systems for budgeting and economic analysis. In one company, the system never caught on despite long training demonstrations for division employees and other potential users. These people seemed excited about the system's possibilities, but never used it unless corporate planners did all the work for them. In contrast, the training program for the system in the other company fostered immediate and active involvement. To attend the workshops, people were required to include their own financial analysis problems. They learned to use the system by working on these issues. When the workshops were closed, many users were enthusiastic: not only did they know how to use the system, but they had also shown to themselves that it could help them. Use a prototype: Two ever-present dangers in the development of a system create a large, expensive one that solves the wrong problem or creates one that some people in the organization can't live with. Either can happen, not only when the system is designed without consulting the user and affected parties, but also when there is no one who has enough experience with the particular type of system under consideration to clearly visualize its strengths and weaknesses before it is built. Implementers of a variety of systems in my sample avoided these traps by building small prototypes, giving users something specific to react to. As a result, the large version could be developed with a realistic notion of both what was needed and what would fly in the organization. A similar approach, also successful, was simply to build systems into small pieces that could be used, modified or discarded easily. Connect the user with the responsibility: Each new module or application developed as an outgrowth of one of the three sales information systems I mentioned earlier goes through three stages. The first phase consists of general, non-binding discussions about any relevant problem areas that user groups are concerned about. After research from the management's scientific staff, the second phase is a short formal problem statement written in connection with the user group. In addition to describing the problem, this statement goes beyond the methodology and resources that will be needed to respond to it. The third stage is a formal request for authorization of out-of-pocket expenses. Sell the system: In one of the companies I studied, a marketing analytics group used a direct sales procedure to convince people of the benefits of a sales forecasting system. The trajectory was very simple: they compared manual monthly forecasts for one year with the system's forecasts. The system's forecasts proved to be more accurate in ten months out of twelve, with less errors collected than the manual ones. The system was adopted. In another company, management had a real-time system installed for monitoring largely automatic of a cheap consumer item to minimize material losses due to creeping misalignments in machine settings. During the initial installation, the implementation team discovered suspected, but previously unfounded, cheating by stykkavsnapping employees; more pieces left many machines than getting into them. Discrete hints were dropped that the screen had to be checked because the recorded impossible results. The staff were sold on the new system: they knew very well that it worked. Fundamental changes Despite long experience with EDP, many organizations have not used more than one or two of the seven types of decision support systems I have illustrated here. One reason for this is that it can be difficult to justify such systems: quantifying the impact of replacing ten secretaries with a computer is one thing, while quantifying the impact of improved individual efficiency of line personnel is a completely different thing. Another reason is that implementation can be difficult: many of the ideas come from other than the users. Nevertheless, it makes sense to develop a decision support system when it becomes clear that fundamental change may be needed in the way decisions are made and implemented. Often, the process of defining the system is as valuable as the system produced. My last point is that the concept of decision support systems itself can help managers understand the role of the computer in their organizations. As the name implies, the computing systems systematize and accelerate the mechanics of continuing business activities by automatically processing masses of data. On the other hand, the decision-oriented extensions of these systems help people make and communicate decisions about administrative and/or competitive tactics and strategy. The decision support systems I have discussed go one step further. Instead of starting as extensions of existing computing systems, many decision-making systems are built from scratch to improve or speed up a decision-making process. The underlying philosophy is that using computers to help people make and communicate decisions is as legitimate and worthwhile as using computers to process masses of data. There is evidence that this viewpoint has captured to some extent and is becoming more widely accepted. The implication is not that all organisations should come up with the bandwagon, but rather that leaders should be aware of the opportunities and challenges in this area, and should try to consider whether their organizations should move in this direction. 1. Steven Alter, A study of computer aided decision-making in organizations, Ph.D. thesis, Sloan School of Management, MIT, 1978. A version of this article appeared in the November 1976 issue of the Harvard Business Review. Review.