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1. Introduction
During the past few years much has been said and written about the management and organization of information. This concept is mostly referred to as information resource(s) management or IRM. I do not intend to discuss interpretations of different terminological versions of this concept. What I am going to explain is the background and plans of a Danish project aiming at the establishment of better methods to manage the flow of information in companies.

When I refer to IRM in the following, I am thinking of both the treatment of information as a strategic resource as well as the integrated management of automated and manual information resources. The types of information to which I refer are different and come from internal as well as external sources. One could mention political, financial, marketing, research and development information, and the sources might be newspapers, publications, patents, databases, researchers, or employees.

2. IRM has become a concern at managerial level
It has been said that IRM is today where business management was 20 years ago. In the 1960s, the strategic objectives in US companies were technical efficiency and control, based upon the application of electronic data processing and telecommunications. The results have often been that a number of organizational units, handling different kinds of information, are scattered throughout the company and are lacking any central integration or coordinating focus. In most cases, management has considered such activities as overhead expenses and has not equated them with the line organization.

When management has become increasingly aware of this problem, it is above all because of the costs. Even though the unit cost of information technology is decreasing, the cost of information management activities is growing in absolute terms in most companies, largely because such activities have a significant human resources component. The IRM concept has, during the last 6-8 years, introduced American and Japanese business ideas like horizontal management of information technologies and linkage between business planning and information technologies.

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Before 1980, articles and reports concerning information management were mostly written by industrial information officers and focused on their situation. Nowadays, an increasing number of IRM studies and analyses can be found in American business and management reviews, carried out by managers from large private enterprises or research staff members from colleges of business administration. Analyses and case studies from Japan can be difficult to access for linguistic reasons, and the results stated can be harder to generalize because the IRM concept is an integrated part of the individual company's culture and management development. In my opinion, however, we can find a lot of inspiration both from the USA and Japan, and I shall briefly mention an example from a Japanese company where the information management system has been the backbone of the organization.

3. A Japanese example

The company in question, which is primarily engaged in the manufacturing of electronic equipment, has implemented a fully integrated information management system at its headquarters. The aims of the system are: to promote efficient gathering of information from internal and external sources, matching the needs of each hierarchy of management; to ensure effective use of the information processed by individual departments; and, lastly, to facilitate the decision processes at top management level.

The executive office information system has two main functions: firstly, personal activity support, and secondly, presentation of total company information. The first of these has several sub-systems of which the most important are: schedule management sub-system, interview detail retrieval system, and corporate organization sub-system. The second offers search possibilities in an internal and external business information retrieval sub-system and in a business plan sub-system. An economic electronic databank service and an image information system are linked to the executive office information system, managed by the Business Information Centre. This also deals with the central management of internal and external printed, video, and audio-visual material as well as other information services. Finally, another range of online systems is installed which increases the efficiency of daily work. These are an electronic mail system (transmission of notifications of meetings and short documents), a cashier system (disbursement of internal expenses), a conference and reception room reservation system, a time-card system (attendance data of the employees for payroll management), an electronic telephone directory system, and an employee cafeteria system (payment and menu choice).

All these systems are linked and accessible in a Local Area Network (Fig. 1). The corporation has in fact two filing systems, and data are classified and managed in the way most convenient for each department. Only data that are likely to be shared by several departments are stored in the common filing system of the Information Centre.
The system has been designed to fit into the organization of this particular corporation and meets the users' needs, but many of the main ideas and facilities could be applied in a general system concept.

Fig. 1 Flow diagram for the information system in the Japanese example

4. The situation in Denmark
In Denmark the problems and possibilities of optimizing the management of information resources in industrial companies have been the subject of discussion during the last few years. Of course, many large companies have noticed the increasing problems in obtaining or retaining a high level of specialized knowledge necessary for advanced R&D activities, profitable production and marketing, but these problems are seldom connected with possible problems in information handling.

In Denmark you can often observe the following situation. The activities of a big company are registered in a large number of files, each designed to fit a special purpose (e.g. financial control, pricing, cost/benefit analyses). Much of the information, although relevant for other purposes, cannot be re-used, because data are incompatible and stored in such a way that co-ordinated retrieval is not possible. Besides, different search languages make the access complicated. In other words, there is no internal information policy based on
the entire company’s long-range needs. In 1986 a group of people from the Danish I&D sector, the Danish Technical Information Service (DTO), the Royal School of Librarianship, and the National Technological Library took an initiative to present the IRM concept to the Federation of Danish Industry. The first result of this contact was a conference in 1986: ‘Managing the flow of information — a responsibility of the company’s top management’. Managers from Danish companies were invited to attend. The large number of participants at the conference, the viewpoints presented, and the questions asked indicated an increasing interest in the topic.

5. Presentation of the Danish project

The next initiative was the planning of a joint IRM project, which has the following sub-goals:

(i) to reveal general problems in the present situation as to the management of the flow of information;
(ii) to analyse the information management situation in leading foreign companies and, inspired by their experiences, to propose models and methods possible in a Danish context;
(iii) to adjust and implement an integrated IRM system as a model in three companies which agreed to participate in the project as case institutions;
(iv) to develop and pursue IRM training for executives from Danish companies;
(v) to disseminate information about the project results to a broad target group taken from Danish industry and the I&D sector.

Input from the companies involved is anticipated to come from:

(vi) the contact persons appointed by the firms;
(vii) internal information users from different hierarchical levels of the organization;
(viii) organizational diagrams, company plans, descriptions of computerized systems, job descriptions, etc.;
(ix) examples of information products;
(x) descriptions of methods and principles utilized earlier by the companies whether or not they were successful.

We believe that there are parallels between the problems concerning the management of information in the industrial sector and in the I&D sector and that information specialists, with their experience from information analyses, systems design, and user–system interaction, could contribute to the solution of the IRM problems in companies.

The project team consists of representatives from the I&D institutions already mentioned, in close collaboration with the three companies which have agreed not only to open their doors as case organizations but also to supply the project with in-house expertise at the technological and the managerial level.
The three companies all belong to the group of large Danish enterprises. However, it should be noted that even the largest companies in Denmark have seldom more than 4-6000 employees. Besides, the three companies do not have much in common apart from their size. One of them supplies cement plant and machinery, one produces pharmaceutical products, and the third offers services such as cleaning, security, and catering. For all of them, however, the in-house development of new technologies is playing an increasing role, and such developments might turn out as new, valuable by-products.

The back-up and financial co-sponsoring from the companies are prerequisites to getting the financial support which has been obtained from the Council of Technology under the administration of the Ministry of Industry. The project is planned to be carried out within a two-year period in seven stages and was started in the Spring of 1987.

6. The contents of the project stages
The first two stages, which will be carried out more or less simultaneously, are an analysis of the present situation in the three companies and an analysis of the state of affairs in foreign companies where it is possible to draw analogies to Danish companies. Results from the implementation of new management tools and theories, technological as well as organizational, which have been reported in the scientific literature and from conferences will, of course, be used in the research stage.

The three company analyses will focus on different aspects of IRM. In one case, the analysis will especially concentrate on the organizational consequences of the implementation of an integrated, computerized management system, the interrelation between human and computerized information resources, and the correlation between the company’s long-range plan and the information plan. The second one will look especially at the use and re-use of external R&D information and co-ordination between the activities of different internal information centres. In the third case, special attention will be focused on the merging of different kinds of external information (e.g. product information and financial information) and the utilization of value-added information for different purposes in the organization.

In one case, the IRM project is integrated in a corporate plan where the goal is to involve middle and top management in the harmonization between the long range plan and a new information plan. Aspects like users’ needs and systems acceptance, organizational changes and responsibilities at different levels are to be treated, and the views of about 60-70 persons will be collected via questionnaires. The information management state-of-the-art of the company will be explained in terms of the IRM concept and will be the basis for a discussion of the best possible systems planning philosophy, probably in between top-down and bottom-up planning.

It is intended that the knowledge of how to manage information and how to work out an adequate IRM concept should be part of each manager’s know-how.
Figure 2 shows the structure of the internal information and decision system where different levels should be subject to analyses.

The following illustrates the sort of questions we are going to ask. Do you have an information plan of any kind? Does your plan integrate information and IT needs with the company's overall business plan? If you do not have an information plan, why is this so? Does the information taxonomy fit into all levels of the organization? How is information technology used? Does the use of information technology lead to organizational changes? Has the structure of the information system and the quality of the output any registered impact on the company results? What kind of information do you find and in which parts of the organization? Who can access the information? How do you access the information? How is the information presented?

Important factors to take into consideration when preparing detailed questions and evaluating the given answers concern the company profile or the role preferred by the individual firm. For example, is it an innovative company? How is a new product developed? Is there an R&D organization? Is it a financial investment company? Does it manufacture? What sort of marketing organization has it? What education or training system has it?

In the third stage of the project, proposals will be presented on general IRM methods and tools for a prototype IRM system.

Then follow: implementation of the proposals from stage 3 in the case companies; elaboration of material for a one-day seminar on the planning and implementation of IRM in companies; the conduct of two pilot seminars on industrial IRM where the participants will be offered the opportunity to visit the case companies, the target group being the industrial managers; and finally, the results of the project will be further disseminated through the publication of a report and the organization of conferences and by articles in magazines.
7. The vision of the project: to present a model of an integrated IRM system to Danish industry.

The main aim of the project is to present an IRM concept of an integrated systems organization as a ‘product’ like new equipment or any new useful tool to the company. The model should comprise the information technology aspects as well as the organizational aspects.

The basic concepts of the integration of planning and technology, integrated systems support, and operations and information services should be used to build a model of the IRM organization that is appropriate for most companies with any significant information activities. A given company might not perform all the tasks described in the model IRM structure, but most firms include enough of them to make the new organization efficient and cost effective.

An important point is the educational aspect. The knowledge of how to manage information resources should not be centralized in the organization but should be the basic know-how of each individual manager, just like knowledge of how to manage the economical resources. The results and experiences from the project should therefore be used for the establishment of specialized knowledge in the participating companies and the project team that could be re-used for the above mentioned development of IRM training for executives from Danish companies.

The proposed strategy for the implementation of the integrated IRM organization in a company would most likely begin by bringing scattered information units under a common management, and the most logical way of building a new structure would be with the use of computer systems and possibly also telecommunications. It should be added that the model structure could be adopted without upsetting corporate or divisional unit structures and that the fully integrated model need not be implemented in a single step.

A further objective of the project would be to obtain acceptance of the concept from the corporate staff, not forgetting the managers at middle and top level. This point is very important since the most common hindrance to developing an integrated IRM structure is resistance to change. Such objections should be overcome by convincing staff and managers that an integrated system will benefit them through the availability of greater human and technological resources, increased productivity, and lower costs.

Bibliography


