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A Case of Information Technology and Information Seeking Behaviour among Managers

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ABSTRACT

This paper highlights a case study carried out in a rubber-based medium-sized manufacturing company on the information seeking behaviour and use of information technology (IT) of its 30 top and middle level managers. The theoretical model developed in this study can be used as initial groundwork for future studies in information seeking behaviour of managers generally and Malaysian managers specifically. Generally, results of the study showed that managers relied on both internal and external information. Findings of the study also showed that there was a correlation between the functional role of managers and their IT and information seeking behaviour patterns. An interesting finding was that the managers would rely more on informal seeking patterns rather than computerized information seeking patterns.

ABSTRAK

Kertas ini cuba menonjolkan satu kajian kes yang telah dilaksanakan di sebuah syarikat pembuatan sederhana berasaskan getah berkaitan tingkah laku pencarian maklumat dan penggunaan Teknologi Maklumat (IT) di kalangan 30 daripada pengurus pertengahan dan pengurus atasannya. Model teoretikal yang telah dibangunkan dalam kajian ini boleh digunakan sebagai usaha awal untuk kajian masa akan datang dalam perlakuan pencarian maklumat pengurus secara amnya dan pengurus di Malaysia secara khususnya. Secara keseluruhan, hasil kajian menunjukkan bahawa pengurus bergantung kepada maklumat dalaman dan juga maklumat luaran. Hasil kajian juga menunjukkan terdapat korelasi di antara peranan dan fungsi pengurus dengan pola perlakuan pencarian dan penggunaan IT di kalangan mereka. Dapatan kajian yang menarik ialah pengurus lebih bergantung kepada pola maklumat tak formal (komunikasi interpersonal) daripada pola pencarian maklumat berkomputer.

INTRODUCTION

In the global marketplace of the 1990s, information is power and money; indeed in some industries, as in the securities industry, they function entirely on information. The integration of new electronic systems in the global industry has increased both the quality of information and the speed at which it is disseminated. Information technology (IT) and the need for global information are constantly changing the way managers, as knowledge workers, obtain, manipulate and disseminate information. IT is increasingly becoming an important tool to support managers in decision making relating to planning, controlling and operating company businesses. Managers need new sources of information that cover global economic trends, international production and new products data, international mergers and acquisitions and others. Previous studies in several countries (Vlahos & Ferrant 1995) on the use of IT by managers and the amount of time they spend using it have added to our understanding of the subject matter studied. However, very little study or no specific study has been done in Malaysia on the information use of IT and the information seeking behaviour of managers. Previous theoretical perspectives (White 1986; Ghani 1992; Stein 1995) have shown that the need for information by managers and their seeking behaviour can be defined by the functional roles they perform within the organization. How the information is sought and used in decision making will be dependent on a range of interrelated personal and organizational factors. Organizations in Malaysia have realized the importance of IT in sound decision making, and research have shown that when managers are IT literates, they have helped improve the information systems available in the organization so that information needs for effective decision making can be met by managers (Halimah & Tengku Mohamad 1996).

Studies have also shown that information seeking behaviour of managers are still very much through informal communication (contacting colleagues and experts through 'old boys network' and the 'invisible college'), because information system available (at least the commercial systems) are not yet able to understand and adapt to the needs of managers automatically, managers have to currently understand and adapt to the system they want to use (Yuan 1997). Learning and adjusting to the system takes time and sometimes managers cannot have the time and patience required and thus they resort to colleagues and experts (informally or formally as it may be). However, they do access the information systems but not on a regular basis (Boyd & Warne 1990; Case, Borgman & Meadow 1986; Cassells & Whittall 1990; Kaser 1990; Leipzig, Kozak & Swartz 1983; Walton & Dedert 1983).

Managers in whatever industry form a distinctive group of information-seekers. Operations, corporate affairs and research managers in particular are intelligent and motivated users of information. They are in the forefront in

utilizing information systems that allow them to build forecasting models, enhance new designs of products, create quantitative valuation models, and conduct 'what if' scenarios. These systems, in addition to improving the quality of product research, are to increase a manager's effectiveness and productivity (Yuan 1995). Stein (1995) in his study found that managers in this information era, cannot operate alone and that teamwork methods generally, and methods involving IT particularly, have shown greater success. This means that, in order for it to happen effectively, information that is filtered down to other managers in the department and other departments not only have to meet their needs quickly but will also have to be accurate.

White (1986), Wilson (1996), Jones (1995) and Mawhinney (1990) in their studies indicated that an effective information system that can meet the needs of managers can be defined by models based on differential needs dictated by the functional roles of individual managers within the organization. This paper examines a similar concept but based on an adapted localized theoretical model framework in relation to a case study carried out on IT and information seeking behaviour of managers in a medium sized manufacturing rubber products based company.

THEORETICAL FRAMEWORK

Knowledge workers (including managers) continually seek for new information. They collect, monitor, store and disseminate information that are product-related and industry related. Their information seeking behaviour may be influenced by their environment or their roles and functions. Previous research (Baldwin & Price, 1997) found that knowledge workers generally (including managers) depend on various sources of information (both internal and external information). In this study, the theoretical model is designed based on the basic assumption that managers need to be equipped with the necessary information to keep abreast in the information era: to meet the changing needs of the business world, business legislation, international contacts, investment trends, general economic information and other aspects pertaining to business, that will contribute to effective decision making based on their functions and roles in the organization (Fisher 1998). Five main areas of functional divisions identified in the study are: production/operation, sales, marketing, finance and personnel. Their information needs are as follows:

Production/Operation Managers Their responsibility is to ensure that production lines turn out products on time to meet set targets and schedules. They are also concerned with quality, cost, and measures of performance (machine and man). Previous studies by White (1986) and Stein (1995) found that production/operation managers handled large amounts of internal infor-

mation either from their subordinates or information systems available in the organization. In these studies too, it was found that production/operation managers also relied on external information for new processes and techniques of production.

Sales Managers Their responsibility falls into two categories: firstly, for promoting and selling the company and its products; secondly, handling day-to-day administration of sales. Previous research has shown that they need external information on specific company pertaining to whereabouts, size and nature of the companies. On the other hand, they would also need internal information from other departments to negotiate with customers on price, delivery and progress of products.

Marketing Managers Marketing problems may fall into two broad areas: firstly, the need to continuously access the markets where the company's products are distributed; secondly, the assessment of new markets. Thus, marketing managers would need both internal and external information to execute their tasks effectively.

Financial Managers They are responsible for the collection and collation of cost information within the company, preparation of management and general accounts and overall activity of payments, credits and debts. Thus, financial managers would basically need internal information but external information such as exchange rates, changes in regulations affecting taxation, export duty and credit information on other companies would be an advantage to them.

Personnel Managers They deal mostly with human resource of the company and thus would need more internal information on wages and pension, absenteeism, service and performance. However, they would also need external information on employment law, legislation, wage rates (local and overseas) and pension schemes and rates.

Thus, generally it can be said that the information needs of managers seemed to suggest a correlation between functional roles and specific information needs. The theoretical model of the present study is as shown in Figure 1. The selected constructs are: IT and information needs and information seeking behaviour of managers, functions and roles of managers, external information, internal information, types of information preferred and types of communication: computerized communication (Internet, e-mail, and teleconferencing), traditional communication (printed documents like books, journals, off-line database), informal communication (experts and colleagues or invisible college) and formal communication (seminars, conferences and workshops).

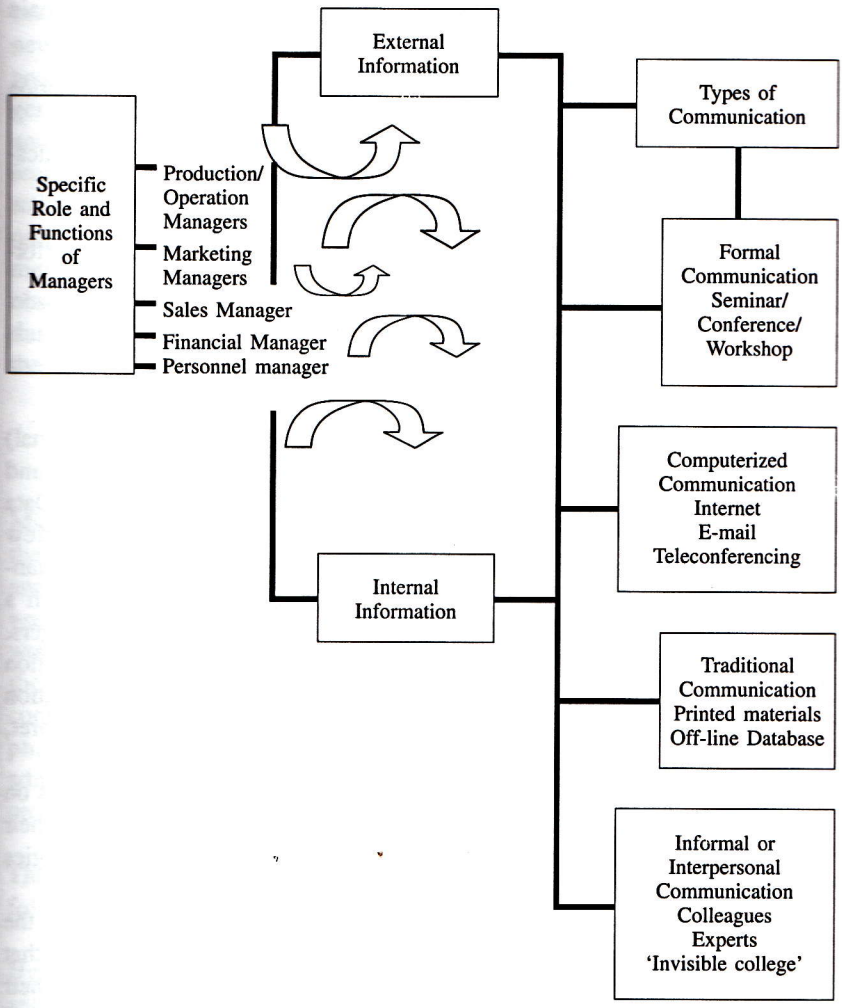

FIGURE 1. Prosposed conceptual model on IT and information – seeking behaviour of managers

OBJECTIVE OF RESEARCH

The main objective of this study is to investigate the IT and information seeking needs and information seeking behaviour of managers in a manufacturing rubber based medium sized company (with paid up capital of roughly between RM2.5 million – RM4 million) in Kuala Lumpur, Malaysia. Other details (company turnover and sales) on the company cannot be released on

request of the company studied. The study hopes to answer the main questions as follows:

- What type of communication method did managers use in information seeking?
- Does the functions and roles of managers affect the type of communication and information used?
- Do managers possess IT and information skills?
- What categories of information do managers found important in performing their tasks?

RESEARCH DESIGN

The research was carried out using an ethnographic method (observational) through workshops (a videotape was run throughout the sessions) and while they were carrying out their information seeking tasks on the job. Data were collected through a semi-structured questionnaire and interview schedule. Data of the research will be presented both qualitatively and quantitatively. This methodology was thought suitable in understanding such a complex social phenomenon as information seeking behaviour of managers. Due to the fact that the researcher was always available (during the duration of the research) as a 'facilitator' to help overcome the subject's information seeking problems, this methodology enabled the researcher to interpret, explain, assess, translate and make conclusions on the data obtained.

The questionnaire was used to obtain information from the managers on aspects among others: pertaining to the background of the managers, their levels and functions, type of information, the sources sought, the strategies used, and the use of IT in their information seeking process.

The interview schedule was devised to enhance certain aspects of the questions asked in the questionnaire (especially open ended questions that needs further clarification) and questions that are subjective based on their perceptions and preference on the methods chosen in the process of information seeking.

The sample constituted of 30 top and middle level managers in a manufacturing rubber-based medium sized company. Each department was represented by six managers and they all had no formal training on information seeking or information searching skills. They include production/operation managers whose role and functions among others include: quality assurance, research and development, and measures of performance of new products developed, of machines and human manpower; sales managers whose role and functions include: promoting and selling the company and its products, acquiring information on size and nature of other companies and their products; marketing managers whose role and functions include: access

markets where company products are/can be distributed and assessment of new markets; financial managers whose role and functions include: collection and collation of cost information within the company, preparation of management and general accounts as well as overall activity of payments, credits and debts; and personnel managers whose role and functions include: overseeing welfare of the human resource of the company, their wages, pension/retirement, absenteeism, service and performance, and acquiring information on employment law, legislation, wage rates (local and overseas) and retirement/pension schemes. The researchers themselves administered the observation, the questionnaires and interviews. Throughout the three months duration of study, the researchers were constantly in the company observing the information seeking behaviour of the managers.

ANALYSIS OF DATA

Miles (1983) stated that the main problem in analyzing qualitative data is that the methods of analysis have not been planned carefully. Due to this, the data analysis of this research was planned in two phases. In phase one, analysis was done based on ethnographic approach where subjects were trained through workshops on information seeking methods. They were given exercises and their seeking behaviour were observed closely through discussion and consultancy with researcher as facilitator (the sessions were videotaped). In phase two, data were obtained from the questionnaire and interview administered. Questions in the questionnaire were analyzed using the SPSSX program.

Three hypotheses were developed and tested using the one-way-ANOVA. The hypotheses were developed to strengthen the data and they are as follows:

Hypothesis 1 (H1) There is a significant difference between the functions and roles of managers and the use of IT.

Hypothesis 2 (H2) There is a significant difference between the functions and roles of managers and their information needs.

Hypotheses 3 (H3) There is a significant difference between the functions and roles of managers and the types of information required.

RESULTS OF RESEARCH

METHODS OF COMMUNICATION USED BY MANAGERS IN INFORMATION SEEKING

Some items in the questionnaire were designed to measure constructs that indicate the mode of communication preferred by managers in their information seeking process. The methods of communication can be divided into three types, namely: interpersonal or informal communication (all information obtained from experts, colleagues and 'invisible college' whether done formally or informally were categorized in the model as informal communication), formal communication (all information obtained through seminars, conventions, meeting of experts, and congresses were categorized in the model as formal communication), traditional communication (all information obtained from the libraries – printed materials like books, journals, technical reports, off line database and the like were categorized in the model as traditional communication) and computerized communication (all information obtained through the use of IT were categorized in the model as computerized communication). Table 1 shows that interpersonal communication is still very important to managers with a mean per cent of 78.2%. Managers also found formal communication (seminars and conferences) and traditional communication (particularly statistical reports) both showing a mean per cent of 79.2% as important methods of acquiring information. Computerized communication (e-mail, Internet and teleconferencing) is very much under used with a

TABLE 1. Patterns of communication among managers

Method of Communication	Mean Per Cent
Interpersonal or Non-formal Communication : colleagues, experts, 'invisible college'	
1. Personal	78.2
2. Telephone	79.2
3. Letter	5.6
Formal Communication : seminars, conferences, conventions, meeting of experts and workshops	79.2
Traditional Communication	
1. Journal	78.2
2. Books	58.2
3. Statistical Reports	79.2
IT Method	
1. E-mail	6.9
2. Internet	6.9
3. Teleconferencing	6.9

mean per cent of only 6.9%. It was observed that the few that used IT as a method of communication were young managers who have just entered the job market. The senior managers were more at ease using the informal, traditional or formal method of communication when seeking information for their tasks.

MEETING INFORMATION NEEDS BASED ON FUNCTIONS AND ROLES OF MANAGERS

This current study confirms the findings of previous research, which indicate that information needs of managers are based on their functions and roles in the organization. As can be observed in Table 2, generally, the operations and sales manager relied very heavily on internal information rather than external information; whilst the marketing, financial and personnel manager relied more heavily on external information rather than internal information. As expected, marketing managers needed more strategic information of qualitative nature suitable for market research and market intelligence, which indicates a mean per cent of 79.2% for internal information and a mean per cent of 89.3% for external information. It was interesting to observe that marketing managers found financial information as important which makes up a mean per cent of 79.2% for internal information and a mean per cent of 79.4% for external information. This pattern can also be observed among financial managers who not only indicated financial information as important with a mean per cent of 89.3% for internal information and a mean per cent of 89.5% for external information, but they also indicated strategic information as important with a mean per cent of 79.5% for internal information and a mean per cent of 79.3% for external information.

TABLE 2. Information needs of managers: Functions and roles

Functions and Roles of Managers	Type of Information							
	Internal				External			
	S	F	T	O	S	F	T	O
	M P	M P	M P	M P	M P	M P	M P	M P
Production	79.3	59.8	82.3	89.3	79.5	82.3	59.8	59.6
Sales	59.8	79.1	82.5	59.7	59.6	59.7	59.5	59.8
Marketing	79.2	79.2	69.5	59.6	89.3	79.5	79.3	82.8
Finance	79.5	89.3	69.5	69.3	79.3	89.5	79.5	69.6
Personnel	69.3	79.2	59.8	59.6	79.2	79.6	79.3	69.3

Key: S-Strategic, O-Operational, F-Financial, T-Technical, M P- Mean Per cent.

MEETING INFORMATION NEEDS USING IT

IT is increasingly used to fulfill information needs of managers more effectively. Table 3 shows that marketing managers followed by financial managers and sales managers are using IT the most. Mostly marketing managers use Internet. It is the same with the information system, e-mail and teleconferencing services available in the organization. On further investigation, it was also found that the younger managers used IT more than the senior managers. This finding correlates with the previous research by Mawhinney and Lederer (1990).

TABLE 3. Meeting information needs with IT

Type of Managers	Information System	E- Mail	Internet WWW	Teleconferencing
	Mean Percent	Mean Percent	Mean Percent	Mean Percent
1. Production	53.5	43.5	–	–
2. Sales	69.3	43.8	43.8	–
3. Marketing	78.9	69.8	78.9	69.9
4. Finance	78.5	43.5	43.5	43.5
5. Personnel	53.5	43.8	43.5	43.5

IT AND INFORMATION SKILLS OF MANAGERS

Managers who are IT and information literates have an advantage over managers who are non-literates. Table 4 shows that marketing managers are the best IT and information literates among the managers with a mean per cent of 78.9% and a mean per cent of 69.5% respectively; followed by finance managers with mean per cent of 78.6% and mean per cent of 53.5% respectively. This is in line with the findings in Table 2. The plausible reason

TABLE 4. IT and information skills of managers

Types of Managers	IT Skills	Information Skills
	Mean Percent	Mean Percent
1. Production	53.6	53.6
2. Sales	69.4	43.8
3. Marketing	78.9	69.5
4. Finance	78.6	53.5
5. Personnel	53.5	43.5

could be that both the marketing and financial managers used financial and strategic information for their decision making tasks.

RESULTS OF HYPOTHESES TESTED

Three hypotheses were developed to strengthen the data obtained. The three hypotheses were tested and the results are as depicted in Table 5. As can be observed, H1 shows the F ratio value (12.66) is larger than the F critical value (3.87) at the significance level of 0.05. Thus, there is a significant difference between the functions and roles of managers and use of IT.

For H2, the F ratio value (4.1435) is larger than the F critical value (3.87) at the significance level of 0.05. Thus, there is a significant difference between functions and roles of managers and their information needs.

For H3, the F ratio value (4.1435) is larger than the F critical value (3.87) at the significance level of 0.05. Thus, there is a significant difference between the functions and roles of managers and the type of information required.

TABLE 5. Tests on hypotheses: H1, H2 and H3

Hypothesis	F (Ratio)	F (Critical)	Significance
H1	(12.66)	(3.87)	0.05
H2	(4.1425)	(3.87)	0.05
H3	(6.185)	(3.87)	0.05

IMPLICATIONS OF STUDY

The findings of this study have implications on information systems designers who can have data on how managers behave in information seeking and thus develop systems which meet specifically the needs of the different types of managers. Systems developers will be able to design not just the different types of information for the different types of managers but they can also design the right retrieval interfaces and database particularly for the managers in the specific fields required based on the information seeking behaviour data obtained.

Study on the information seeking behaviour will also have implications on the general managerial behaviour and work methods, particularly on decision making of the different type of managers based on their role and functions. Managers as knowledge workers today, more than before, need latest and accurate information in decision making to have an edge over their competitors.

CONCLUSION

Data from the study revealed that generally, managers need both internal and external information although there are specific types of information that they preferred. For example, the study shows that marketing managers used more external information for market intelligence, market research and strategic planning. However, they also need internal information in order to carry out their tasks effectively. On the other hand, finance managers used more internal information on wages, cost etc. An interesting finding is that both marketing and finance managers used strategic and finance information in carrying out their tasks.

Generally, the study also revealed that managers preferred informal and formal communication rather than computerized communication in their information seeking process. Whenever information systems, e-mail, Internet and teleconferencing were used, it was only among the younger managers who have graduated within the last five years. The study also revealed that the managers were neither IT nor information literates. This means that the organization will have to make positive efforts to encourage its managers to use IT in their information seeking process.

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