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CRM AND EDI EFFECTIVENESS IN MIS - A CASE STUDY OF SELECTED ORGANIZATIONS

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Abstract

The abstract is a succinct account of the thesis or dissertation containing a statement of the problem, procedure or method, and conclusion. The pace of change in technology has accelerated rapidly in the past decade providing various opportunities to companies to improve their efficiency and competitiveness. One of the useful and cost effective technological innovations is electronic data interchange (EDI). EDI has being increasingly used in many industries, as companies realized the potential benefits and competitive advantages of adopting electronic data exchange in their operations. EDI is strategically important, because good information systems are critical to the survival of many organizations. This paper presents an application of EDI in a SME in automotive industry in Gurgaon. With this study, our aim is to show the benefits of using EDI applications, explain how companies easily implement EDI in their system and what the advantages of these applications are.

Management Information System

Management information system (MIS) plays a significant strategic role within organizations (Bergeron and Raymond, 1995; Henderson and Venkatraman, 1999;

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Porter and Miller, 1985; McFarlan et al., 1983). Strategic management information system can support or even shape business strategy. Furthermore, some conventional management information systems become strategic when used in innovative ways. Since the early 1990s, improving the management information system planning process has been one of the top 10 concerns of senior MIS executives (Janz et al., 1996).

What is MIS

A management information system (MIS) provides information that is needed to manage organizations efficiently and effectively.[1] Management information systems are not only computer systems - these systems encompass three primary components: technology, people (individuals, groups, or organizations), and data/information for decision making.[1]Management information systems are distinct from other information systems in that they are designed to be used to analyze and facilitate strategic and operational activities in the organization.[2] Academically, the term is commonly used to refer to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision making, including systems termed decision support systems, expert systems, and executive information systems.[2].

The following are[2] some of the benefits that can be attained for different types of management information systems.[3]

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[1]http://www.occ.gov/publications/publications-by-type/comptrollers-handbook/mis.pdf

[2]O'Brien, J (1999). *Management Information Systems – Managing Information Technology in the Internetworked Enterprise*. Boston: Irwin McGraw-Hill. ISBN 0-07-112373-3.

[3] Pant, S., Hsu, C., (1995), Strategic Information Systems Planning: A Review, Information Resources Management Association International Conference, May 21–24, Atlanta.

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- Companies are able to highlight their strengths and weaknesses due to the presence of revenue reports, employees' performance record etc. The identification of these aspects can help the company improve their business processes and operations.
- Giving an overall picture of the company and acting as a communication and planning tool.
- The availability of the customer data and feedback can help the company to align their business processes according to the needs of the customers. The effective management of customer data can help the company to perform direct marketing and promotion activities.
- Information is considered to be an important asset for any company in the modern competitive world. The consumer buying trends and behaviours can be predicted by the analysis of sales and revenue reports from each operating region of the company.

Kenneth and Jane Laudon identify five *eras* of MIS evolution corresponding to five phases in the development of computing technology: 1) mainframe and minicomputer computing, 2) personal computers, 3) client/server networks, 4) enterprise computing, and 5) cloud computing.[4]

The *first (mainframe and minicomputer) era* was ruled by IBM and their mainframe computers; these computers would often take up whole rooms and require teams to run them - IBM supplied the hardware and the software. As technology advanced these computers were able to handle greater capacities and therefore reduce their cost. Smaller, more affordable minicomputers allowed larger businesses to run their own computing centers in-house.

The *second (personal computer) era* began in 1965 as microprocessors started to compete with mainframes and minicomputers and accelerated the process of decentralizing computing power from large data centers to smaller offices. In the late 1970s minicomputer technology gave way to personal computers and relatively low cost computers were becoming mass market commodities, allowing businesses to provide their employees access to computing power that ten years before would have cost tens of thousands of dollars. This proliferation of

[4]Laudon, Kenneth C.; Laudon, Jane P. (2009). *Management Information Systems: Managing the Digital Firm* (11 ed.). Prentice Hall/CourseSmart.p. 164.

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computers created a ready market for interconnecting networks and the popularization of the Internet.

As the complexity of the technology increased and the costs decreased, the need to share information within an enterprise also grew, giving rise to the *third (client/server) era* in which computers on a common network were able to access shared information on a server. This allowed for large amounts of data to be accessed by thousands and even millions of people simultaneously.

The *fourth (enterprise) era* enabled by high speed networks, tied all aspects of the business enterprise together offering rich information access encompassing the complete management structure.

The *fifth and latest (cloud computing) era* of information systems employs networking technology to deliver applications as well as data storage independent of the configuration, location or nature of the hardware. This, along with high speed cellphone and wifi networks, led to new levels of mobility in which managers access the MIS remotely with laptops, tablet PC's, and smartphones.

Enterprise applications

- *Enterprise systems*, also known as *enterprise resource planning (ERP)* systems provide an organization with integrated software modules and a unified database which enable efficient planning, managing, and controlling of all core business processes across multiple locations. Modules of ERP systems may include finance, accounting, marketing, human resources, production, inventory management and distribution.
- *Supply chain management (SCM)* systems enable more efficient management of the supply chain by integrating the links in a supply chain. This may include suppliers, manufacturers, wholesalers, retailers and final customers.
- *Customer relationship management (CRM)* systems help businesses manage relationships with potential and current customers and business partners across marketing, sales, and service.

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- *Knowledge management system (KMS)* helps organizations facilitate the collection, recording, organization, retrieval, and dissemination of knowledge. This may include documents, accounting records, and unrecorded procedures, practices and skills.

Marketing was the first functional area to embrace the concept of a management information system(MIS) and tailor it to the needs of its managers. In 1966, Philip Kotler coined the term Marketing NerveCenter and explained how a firm could create a separate area for its computer resources dedicatedto supporting marketing activity[5]. This notion was immediately grasped by a number of marketingacademicians who developed conceptual models of marketing information systems (later given the acronym MKIS) to illustrate system components and uses. Montgomery and Urban[6] and Crissy and Mossman[7] viewed the MKIS as a decision support system, whereas King and Cleland[8] recognized its value in planning marketing strategy. Brien and Stafford[9] described how the MKIS could be used in developing marketing programs. All of these models reflect systems concepts by showing the transformation of data inputs into information outputs, with marketing management serving as a control unit and feedbackmechanism, using the outputs to make changes in the firm's operations and its environment.

With the groundwork laid by the theoretical models,marketers turned their attention to applying evolvingcomputer technology to the model components. Thecomputer has been applied to both input subsystems, and output subsystems, as wellas to such advanced applications as mathematical modeling, knowledge bases, and artificial Intelligence. Over the years, the MKIS haspersisted as a concept of how the computer can be applied to support one of the firm's functional areas. The success

[5] P. Kotler, A design for the firm's marketing nerve center, Business Horizons 9, 1966, pp. 63-74.
[6] D.B. Montgomery, G.L. Urban, Marketing decision-information systems: an emerging view, Journal of Marketing
Research 7, 1970, pp. 226-234.
[7] W.J.E. Crissy, F. Mossman, Matrix models for marketing planning: an update and expansion, MSU Business Topics 25, 1977, pp. 17-26.
[8]W.R. King, D.I. Cleland, Environmental information systems for strategic marketing planning, Journal of Marketing 38, 1974, pp. 35-40.
[9] R.H. Brien, J.E. Stafford, Marketing information systems: a new dimension for marketing research, Journal of Marketing 32, 1968, pp. 19-23.

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that firms have enjoyed in applying theconcept should be credited in no small degree to thesound theoretical base provided by the early modelbuilders.The marketers' success has also served as a stimulusfor similar activities in the other major functionalareas. The manufacturing area has always been astrong computer user, both as a conceptual information system and as a component in the physical systemthat performs the production processes. However,manufacturing failed to label their system an ``information system,'' electing instead to adopt the acronyms MRP (first meaning material requirementsplanning and then manufacturing resource planningand CIM (computer integrated manufacturing[10], andnow ERP (enterprise resources planning). Likewise, inthe financial area, the term ``financial informationsystem'' was never really embraced, but considerableattention has been given to a subset of financialactivity called the ``accounting information system''[11]. The most recent effort to develop functionalinformation systems has come in the human resourcesarea in the form of the human resources informationsystem (HRIS) or human resources management system (HRMS) [12]. All of these functional information systems reflect the intent of each area to ensure theavailability of information to be used in understandingand managing its own operations. The systems usuallyinvolve the joint efforts of both the functional areasand the firm's information services (IS) unit.

Research Model and Hypothesis Development

This part begins with describing the components in the research model of this study. It isthen followed by describing the implied relationships between the five main competitivedimensions and the nine typical CRM functionalities identified from the existing studies.

[10] J.F. Cox, S.J. Clark, Problems in implementing and operating a manufacturing resource planning information system, Journal of Management Information Systems 1, 1984, pp. 81-101

[11] J. Choe, The relationships among performance of accounting information systems, influence factors, and evolution level of information systems, Journal of Management Information Systems 12, 1996, pp. 215-239.

[12] R. McLeod Jr., G. DeSanctis, A resource-flow model of the human resource information system, Journal of Information Technology Management 6 (3), 1995, pp. 1-15

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Factors affecting the adoption of CRM packages

Adoptionof a technological innovation is affected by several factors. This results in the belief that theadoption of CRM software package can also be affected by the recognized adoption factors ofIT innovations – top management attitude, organizational characteristics, knowledgecharacteristics, and external competitive pressure. The first three are the internal factors affecting innovative activity, and thelast one is the external factor. Our rationales to identify the stimulating factors were based on:

(1) the study focus on CRM software package adoption, (2) the research scope in the manufacturing industry, (3) the assumed respondents of directors or project managers in thecompany.

External stimulating factors

External stimulating factors indicate how the external environment affects theadoption of the CRM software package. The environmental pressure is mainly due to highcompetitive intensity within an industry or a segment of the particular industry. For a certainIT innovation, the pressure on companies to its adoption may be increased by a high level ofcompetition among themselves in a certain industry. Ifthose companies ignore the importance of its adoption, they may be in a competitivedisadvantage.

There is empirical support for the line of reasoning positing relationship betweencompetitive pressure and the adoption of new innovation. Companies are likely to be the adopter of aspecific innovation within a specific competitive industry because of the interrelatedness ofthis innovation to their existing IT application, qualification of entrepreneurs, company.With the popularity of CRM software packages, many companies are also undercompetitive pressure to adopt this innovation. They acknowledge that some companies arecompeting effectively and winning the race of re-establishing their connections to new andexisting customers through the implementation of technology-based CRM applications foroperationalized relationship marketing principles. CRM softwarepackage

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adoption is asserted to be influenced by external competitive factors – use of ERPand possession of retail outlets. The following hypotheses are proposed:

H1: CRM package adoption is positively related to ERP package adoption

Companies adopting ERP are believed to go further to integrate their ERP systemswith CRM systems because of the interrelatedness of these two innovations. Many companies which have a fully integrated back-office are also lookingfor a fully connected integrated front office. A CRM system is the logicalnext step of ERP as traditional ERP does not include a customer management aspect. According to APICSdictionary, ERP is defined as an accounting-oriented information system for identifying andplanning the enterprise-wide resources needed only to take, make, ship, and account forcustomer orders. The weakness of ERP software, which focuses on the backoffice,can be overcome by integrating with the CRM software.The benefits identified from the integration of CRM and ERP systems are in obtainingup-to-date customer information (e.g., customer service inquiries, customer surveys, customerfeedback and sales force input, in pinpointing and correctingdeficiencies of the internal process, in connecting customers to the companyproduction process, and in improving relationships between partners andcustomers. The integration between front-office and back-office enables acompany to have an effective company-wide planning and to enhance customer service. Itresults in ERP users being under pressure to adopt a CRM package or design their own CRMsystems. Those ERP adopters are also likely to be CRM softwareadvocators. To respond to the need of integrating ERP with CRM, a number of ERP vendors(e.g., SAP, Siebel, Oracle) have integrated some CRM functionalities into their ERP softwarefor product enhancement. In this context, the variable of 'Use of ERP' is defined to seewhether a manufacturing company uses an ERP product, which is either purchased or self developed.

H2: CRM package adoption is positively related to possession of retail outlets

Scholars realize that the amount of customer data in a company is directly related tothe intention of using CRM. Retailingand other servicing companies which gather lots of customer data are recognized to be in thebest position for CRM package adoption. Retailingcompanies (their customers are usually with small order quantity) are under pressure to findtechnological support on customer-facing

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activities, leading retailers have a greater interest in adopting CRM technology thanothers no matter what industry they are in.

Internal stimulating factors

Instead of environmental influences, organizational characteristics are also recognizedto have impact on IT innovation adoption. Thosecharacteristics are associated with company culture, such as top management characteristicsand internal organizational structural characteristics. Internalfactors indicate that those company factors would have an impact on CRM package adoption.Supportive company environments for easy adoption of a new technology among people (topmanagement and users) and willingness to learn that technology, especially in topmanagement, can facilitate its adoption process.For a CRM software package, CRM adoption is affectedinternally by managerial, organizational and knowledge characteristics. In this context, theinternal factors are then divided into two categories – company's specific capabilities and topmanagement attitude. Top management attitudes indicate the familiarity with CRM whilecompany's characteristics indicate specific company's culture and information infrastructure.The following hypotheses are proposed:

H3: CRM package adoption is positively related to CRM familiarity

The knowledge about the innovation's existence and how it functions are necessary toform an attitude towards that innovation. Many studies argue that knowledgeabout an IT innovation has the direct impact on its adoption. According to COLINSCOBUILD English dictionary, familiarity with something stands for how well you understandor know it. It is believed that the company's familiarity with an IT innovation (the extent ofknowledge about it) affects its adoption attitude. Directors play a vital role in buildingfamiliarity with an IT innovation within a company because top management is the decisionmaker on adopting IT innovations. Ifthey are not familiar with an innovation technology, they may not express interest on adoptingthis technology.For adopting a CRM software package, top management must familiarize with this. They have to understand that theCRM software package is a complex application aims at providing assistance in operationlizing relationship marketing. The dependent variable of 'CRM familiarity' is then defined as the awareness ofcompany director's and knowledge about the term of CRM. From the

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above arguments,companies are likely to adopt the CRM software package if they realize what CRM is.

H4: CRM package adoption is positively related to customer-oriented cultural capability(CCC)

Supportive company culture is essential to facilitate the process of IT innovationadoption. Computer-based system is closely associated with the company's environment. It leads to the belief that an effective implementation of new technologiesis linked to the compatibility of a company's culture to make the adoption and diffusionprocess smooth. With a compatible culture for an ITinnovation adoption, it is easier to obtain the commitment among employees to the company'sgoals and strategy. In addition, the willing of top management may provide relevant trainingprograms for their employees due to IT innovation adoption. Proper company culture canreinforce company's goals and strategy by providing employees with a sense of identity andgenerating a commitment to the company's beliefs and values. It results inshared values, beliefs, and understandings that leads employee to support the innovationadoption.In this context, customer-oriented culture is essential prior to implementing the CRMsoftware package. A company has to place customers at the heart for decision-making and setout clearly the importance of the relationship to its business before the utilization of CRMapplications. Customer-oriented companies are with theirbusiness goal on customer retention and they put customer retention in the top. Those companies are looking for thetechnology that will enable them to deliver superior customer value and satisfaction. A company is likely to adopt a CRM package if there is a commitmentto the common goal and vision of making customer value as the key of the corporate strategy. Companies with a customer-oriented culture are likely to beCRM advocators. The independent variable of CCC is, then, defined as the company's abilityto put customers at the centre of decision-making about the issue of customer retention.

H5: CRM package adoption is positively related to information infrastructural desirability(IID)

Information infrastructure desirability indicates how well a company handles datacollected from customers. A well-developed information infrastructure has to

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contain properdata standards, data models, and data structures to ensure the data collected is with highquality, accurate, and readily available. Companies with a well-developed information infrastructure are recognized to be themost enthusiastic users of data-processing technology for maintaining the infrastructurerobustness. Most of them prefer to build an appropriate informationinfrastructure before implementing a business application to facilitate the adoption process.This may be due to they understand that placing infrastructure investments and investments inbusiness applications at the same time may result in infrastructure fragmentation. Information infrastructural desirability may, then, affect the attitude to adopt dataprocessingtechnology (e.g. CRM software package). Launching a CRMsystem requires a large amount of customer, product, and service data. Among these threetypes of data, customer data is the most important in configuring CRM-related informationinfrastructure. Further, it is essential to ensure the required data is readily available, accurate,and in-depth enough to facilitate the CRM package adoption process. Companies with a desirable CRM-related informationinfrastructure are more likely to notice the benefits of a CRM software package. They arealso likely to be CRM package advocators. For that reason, information infrastructuraldesirability is recognized as a key factor affecting adoption of CRM software package. In this context, the independentvariable IID is defined as a company's ability to have readily-available, accurate, and in-depthcustomer-related data.

H6: CRM package adoption is positively related to perceived front-office importance (PFI)

Companies are likely to adopt the innovation which would improve their areas area offocus. Compatible innovation technology, which meets and is consistent with the specificneeds, is able to boost up the rate of adoption. Company may adopt an ITinnovation technology due to its compatibility. Innovation compatibility indicates whether aninnovation is consistent with the company's perceived important areas to improve or not. Acompany is able to improve the existing procedures and value systems by adoptingcompatible innovation. This is why the innovation compatibility to a company has impact onits adoption.A CRM software package improves the productivity and efficiency in the front-officeareas of sales, marketing, and customer service support. Implementing CRM applicationssupport

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customer relationships at customer contact points to optimise the sales process, toimprove service, and to increase knowledge about customers. When companies treat these three areas as strategies for improvement, theyare likely to adopt the CRM software package because of its compatibility. Most companieswho have adopted or have the intention to adopt CRM applications focus on improving frontofficeoperations. If companies once look primarily for point solutions to address specific front-officeneeds, they are likely to seek the solutions that can tackle both customer-facing and financialfunctions. Companies will have a higher chance of adopting CRMsoftware package if front-office areas are important to them. The independent variable of PFIis defined as company's perceived importance of sales, marketing, and customer servicesupport areas.

Summarized statistics

CRM technology is found to be uncommon in Gurgaon manufacturing companies,based on the data collected. The respondents prefer to define CRM as a strategy, and face-to-facecontact is the most popular communication method with customers. The CRM definition withthe highest rating is "the development of win-win relationships with the customer and thecompany". This implies that businesses are less concerned about the supporting technology incustomer relationship management in spite of its popularity in foreign countries. Mostrespondents are classified as non-CRM advocators who have not adopted, or have no intention ofadopting a CRM software package because of resource constraints and the package complexity.

One of the case companies believes that the contemporary CRM software packages are onlysuitable for the companies with lots of customer data and with a large customer base. Thecompany indicated that it would adopt the CRM package if it was economical and easy-to-use.Mostrespondents also perceive little or even no risk in CRM package adoption although risk is acommon factor which affects an IT innovation adoption. A possible explanation for this could be that Gurgaon companies are characterized bya willingness to try new things and to pioneer in testing new things).OM is found to be the most important CRM functionality among the respondents. Itimplies that enhancing the order tracking capability is critical to most Gurgaon manufacturingcompanies. This finding is consistent with the notion

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that order-tracking capability is importantto manufacturers (Matthews, 1999). On the other hand, they place SWS functionality to be of theleast importance. It implies that company's web site was an uncommon tool for communicatingwith customers. The number of companieswith interactive web site will increase tremendously if companies are with a more concreteunderstanding on the interactive benefit of Internet in fostering customer relationship. It can beconcluded that the entire CRM software package is not suitable for Gurgaon manufacturingindustry.

10.4 Identification of stimulating factors on CRM software package adoption

The main findings of this study in the area of CRM software package adoption provide
affirming evidence for the presence and impact of external and internal adoption factors.

External stimulating factors

Literature has shown that the competitive pressures coming from ERP software adoptionand retail outlets possession affect CRM package adoption in manufacturing industry. The studyresults show that only the competitive pressure on ERP adoption has a positive impact on CRMadoption. ERP adopters among the survey respondents may understand that a CRM package caneliminate the weakness of ERP software on the mere back-office support. ERP adopters arelikely to be CRM advocators. The results indicate that possession of retail outlets has nosignificant impact on CRM adoption. A possible explanation could be that those Gurgaonmanufacturing companies with retail outlets have not felt much pressure to adopt a CRM packagefrom their competitors yet. It can be concluded that only the external pressure on a CRMpackage adoption among companies with ERP systems is significant in this research.

Internal stimulating factors

Decision-making on CRM package adoption is also affected by company's internalfactors. Literature has shown that there are four manifestations of a company's internal impacton CRM package adoption: CRM familiarity, customer-

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oriented cultural capability, informationinfrastructural desirability, and perceived front-office importance.

CRM familiarity is found to have an impact on CRM package adoption. It implies thattop management plays a crucial role in making adoption decision of CRM software package. Theresult is consistent with the belief that the adoption decision of IT innovations is largely a resultof top management's attitude. The studyfindings give a message that the company-wide enthusiasm on adopting CRM package will belimited if executives are not familiar with this innovation.Perceived front-office importance (PFI) has a positive impact on CRM adoption. Resultsindicate that a company with greater focus on sales, marketing, and customer service is likely tosearch technological support for effective customer relationship management. This confirms theargument that a company prefers to adopt a compatible IT innovation to its business needs.To CRM software package, it iscompatible with a company with business needs on customer-facing areas – sales, marketing andcustomer service. Additionally, PFI is found to be significantly related to both customerorientedcultural capability (CCC) and information infrastructural desirability (IID). The result isin agreement with the theoretical background that possessing a strong emphasis on the frontofficeis vital in customer-oriented companies and data-driven companies. Customer-facing areasare important for a company with strong customer-oriented culture to improve its performance inmanaging customer relationships. Front-office areas are also important for a company withdesirable CRM-related information infrastructure for making decisions on capturing, managing,and delivering valuable information to shorten customer response time in all customer interactionpoints. The results suggest that CCC is related to PFI in a larger extent than IID is, thus implyingthat a company's awareness of front-office operations relies more on its ability to put customer atthe heart of decision-making than in its desirability of the CRM-related information infrastructure.

From the data collected from the survey and the company interview, customer-oriented companies might not have intended to adopt CRM software package. This contradicts with manyscholars' belief that customer-oriented companies are sensitive to CRM package adoption. The contradiction can be explained by the

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analyzed result that customerorientedcapability (CCC) is only an indirect stimulating factor of CRM software adoption. Thisis because CCC is associated with company's perceived front-office importance (PFI), which isfound to be the potential indicator of CRM package adoption. Those responding companies mayhave little focus on improving the performance in customer-facing areas. The occurrence ofparadox may also due to they lack resources to adopt a compatible IT innovation. Cost and skillconstraints are found to be the major reason for customer-oriented companies not to adopt CRMpackage based on the qualitative company interviews. As a result, adopting a CRM softwarepackage is not directly culture-driven. There may be other constraints which prevent a customerorientedcompany from adopting the package.IID is a significant factor to CRM adoption as expected. It is consistent with theargument that a desirable CRM-related information infrastructure boosts up the probability ofCRM package adoption and the successful rate of CRM package implementation. A company with a desirable CRM-relatedinformation infrastructure is likely to search technological support for maintaining theinfrastructure robustness. It suggests that companies who spend much effort on building adesirable CRM-related information infrastructure are probably being CRM advocators. Thosecompanies may also have a relatively high success rate in CRM package implementation.The stimulating factors identified which have an impact on CRM imply that thecontemporary scholars' beliefs may not be totally applicable to different nations, countries oreven cities. Retail outlet possession (Harvard Management Update, 2000) and customer-orientedcultural capability (Ling & Yen, 2001; Plakoyiannaki&Tzokas, 2002) identified from theliterature that have an impact on CRM package adoption are found to be insignificant. Thepossible explanation could be that there is cultural difference on the adoption attitude to CRMsoftware package between Gurgaon and other areas. This research can then deliver avaluable insight into the factors affecting the likelihood of CRM package adoption in Gurgaonmanufacturing environment. For further research, the research model of this study can be testedfor its applicability in the manufacturing companies, specializing in non-consumer goods or indifferent areas and countries.

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Relationship between competitive orientation and CRM functionalities

Because business applications have to align with business objectives (i.e. competitiveorientation), this research has identified four types of competitive orientation namely "EfficientConformers", "Speedy Deliverers", "Do All" and "Starters". The study has empirically addressedthe attitude of each group to various CRM functionalities.The taxonomy developed provides analytical evidence that supports three of the fourcompetitive priority groups identified by Kathuria (2000). He identified "Speedy Conformers"group which highly focuses on quality dimension while the "Speedy Deliverers" group in thisstudy does not even though both groups are also with a great emphasis on the delivery dimension.The group formation was also considered service dimension, besides the four competitivedimensions of cost, delivery, flexibility and quality as suggested by Kathuria (2000). Thepurpose of taxonomy development is substantially different between Kathuria's (2000) study andthe current study. Kathuria (2000) has utilized his taxonomy fully to investigate the managerialperformance of each group. On the other hand, the contemporary study has utilized thedeveloped taxonomy for investigating the attitude of each group to various CRM functionalities.It results in the study of Kathuria (2000) providing a blueprint for group labelling and groupinterpretation in the contemporary research.

The result reveals that respondents in each of four competitive orientation groups have

their unique emphasis on the five competitive dimensions. Members in the "EfficientConformers" group emphasize the cost and quality simultaneously. Members in "SpeedyDeliverers" group place delivery as the most important dimension to achieve a competitiveposition. Members in "Do All" group place a comparatively high emphasis on all the fivecompetitive dimensions simultaneously. Members in "Starters" group place a relatively lowemphasis on all competitive dimensions although they focus more on cost, quality, and deliverythan other two dimensions. The constituents of "Efficient Conformers", "Speedy Deliverers","Do All" and "Starters" in the sample are 35%, 24%, 21% and 20% respectively. The evendistribution of companies in four groups suggests that there is no dominate combination ofcompetitive dimensions among survey respondents.It is interesting to

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find that the four groups of manufacturing companies are not confinedby a specific industry type, manufacturing role, major customer base, CRM familiarity or thelikelihood of adopting CRM software package and ERP software package. The findingscontradict with the belief of Miller & Roth (1994) that a certain strategic group is more likely tobe found in a certain industry and to adopt a specific type of IT innovation. The result is alsocontrary to the argument that specified competitive orientation is likely to have a certain range ofcustomers (Porter, 1998) and the belief of Kotler et al. (1999) who recognize the relationshipexistence between manufacturing roles and competitive priorities. The belief of Hills (2000) andSkinner (1969) on the relationship existence between a company's cultural variables andcompetitive orientation is supported because it was found that the four developed groups aredifferent on IID.

Group characteristic can be explained by the existing literature. The result indicates that members in the "Do All" group are likely to be customer-oriented and have a very high emphasison customer-facing areas. A possible explanation is that the emphasis on service dimension isassociated with customer-oriented behaviour (Chase & Erikson, 1988).

The study results show that more than one CRM functionality can determine the group membership. Two underlying factors have been discovered from nine CRM functionalities: salesefficiency importance (SEI) and sales scope importance (SSI). Four developed groups havesignificantly different importance on these two factors. "Do All" group has a significantly higheremphasis on SSI than other three groups. It implies that this group may also focus on enlargingtheir customer base, besides improving company performance on five competitive dimensions."Efficient Conformers", "Speedy Deliverers", and "Do All" groups place significant higheremphasis on SEI than SSI. This shows that improving sales efficiency is more important tomanufacturers in these groups rather than enlarging sales scope. "Starters" group, however, gavethe same emphasis to SEI and SSI.By considering each of the nine CRM functionalities, each group is likely to emphasizecertain CRM functionalities that are found to be consistent with its competitive orientation."Speedy Deliverers" group focuses more on OM to improve its order-tracking capability. It isconsistent with the top emphasis of this group on pursuing

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the delivery promises. The resultsindicate that the "Efficient Conformers" group equally emphasis OM and CNM to make betterinventory decisions (e.g. backlogs reduction, better management of work-in-process in eachproduction task), preventing or detecting earlier the production of defective products orunnecessary product features. This finding illustrates their high focus on improving qualitydimensions and pursuing cost reduction. Companies in the "Do All" group place a relativelyhigh emphasis on all CRM functionalities, except for SWS and PC, than other three groups do.This is consistent with their relatively high emphasis on all five competitive dimensions as it isidentified that the existence of a relationship between competitive dimensions and perceivedimportance of CRM functionalities. "Starters" group has a relatively higher focus on CCM andOM than other functionalities. These two functionalities are with the purposes on detecting theproduction defectives and building customer trust with up-to-date customer information (e.g.change of order quantity). It is consistent with their high focus on the dimensions of cost, quality,and delivery. A group's perceived importance of different CRM functionalities could give moreinformation. The "DoAll" group is characterized by a relatively high emphasis on CAM among the four groups,indicating that companies in the group aforementioned probably spend extra effort on customeracquisition than other groups. The other three groups may then be concerned with retainingexisting customers. "Starters" group is characterized by their "neutral" role in determining theimportance of various CRM functionalities as there is no CRM functionality particularlyimportant to them. It implies that "Starters" group possibly is lacking knowledge about this ITinnovation. Additionally, companies in this group may also highly concern with improving backofficeoperations instead of front-office operations.

10.6 Implications for researchers

As there are only a few studies concerning CRM software packages, this study helps to fill the gap in the literature. The research findings have theoretical implications forunderstanding two issues on CRM software package: (1) the adoption of the package and (2)relationship between competitive orientation and CRM functionalities.The result provides evidence for the explanatory power of Kennedy's

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(1983) frameworkon IT innovation adoption. The strong positive association between internal factors/ externalfactors and the likelihood of IT innovation adoption is reproduced and turned out to be true inthis study. Future research can further extend and elaborate the usage of Kennedy's (1983)framework on other software packages.

The study is able to provide directions for future research. MIS, EDI and CRM software packageadoption is not voluntary by making a collective or an authority decision. The pressure amongERP adopting companies is found to have great potential on MIS, EDI and CRM package adoption. Thiscompetitive pressure forces them to adopt a MIS, EDI and CRM package not purely voluntarily. Literature hasshown that this external pressure may come from the innovation adopted that needs to bundlewith another innovation for complementing its weakness (e.g. ERP software package bundle withEDI and CRM software package). This contradicts with the belief that innovation adoption is based on thevoluntary adoption. Future study on innovation adoption should investigate the impact on ITadoption by not only company internal factors, but also external competitive pressure. Othervariables on MIS, EDI and CRM package adoption are also recommended to develop a more comprehensivemodel for this study or the study about adopting other packages in manufacturing industry.

Implications for practitioners

This study provides multiple cues to practitioners on adoption-related and suitabilityrelatedissues of MIS, EDI and CRM software package. The implications of the findings are provided for twotypes of practitioners: (1) MIS, EDI and CRM software package vendors or developers, (2) top management ofmanufacturing companies.

MIS, EDI and CRM software package developers

Faced with the lack of suitable MIS, EDI and CRM solution in the Asian market, thisresearch provides information for MIS, EDI and CRM software package developers about the design of anappropriate package for manufacturing companies. The result of this study showsthat the major roadblock of resource (cost and skill) constraint hinders most manufacturing companies from adopting a MIS, EDI and

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CRM package. It leads them to realize that thosecompanies may adopt a small-scale and economical MIS, EDI and CRM package bundle with training materials(e.g. CD-ROMs, on-line courses).

In addition, this research can help the package developers to pinpoint who their potentialcustomers in manufacturing industry are. From this study, they can gatherinformation about companies which are ERP users, CRM expertise, customer-related dataconcentrator or front-office concentrator are likely to adopt a MIS, EDI and CRM software package. It helpsthem to determine the likelihood of MIS, EDI and CRM package adoption in a company by using aboveindicators. This research also helps them to have a better understanding on the relationshipbetween competitive orientations and EDI and CRM functionalities. MIS, EDI and CRM software package developerscan design a suitable MIS, EDI and CRM package for their customers' companies with only the necessaryfunctionalities included according to the competitive orientations of those companies. It can beconcluded that the study findings give an opportunity for MIS, EDI and CRM developers to explore how topenetrate their products into the manufacturing industry.

Top management of manufacturing companies

The potential indicators identified on MIS, EDI and CRM package adoption suggest important strategiesfor company executives to initiate the implementation process. Top management of companiesadopting ERP software should play much attention to the study findings for strategy planningbecause of intensive pressure on EDI and CRM package adoption among ERP users.Company executives with a positive attitude to EDI and CRM package adoption could implementa variety of strategies to ensure their employees are also advocating EDI and CRM package adoption.They probably need to take employee education and training programs into consideration forstrategy planning to ensure the success in implementing CRM software package. To build acompany-wide customer-oriented mindset, those company executives provide employees withthe commitment to common goals and the vision to make customer value as a key to thecompany's strategy to generate their customer-oriented sense. To boost up employees'awareness of front-office operations, the executives also need to educate their employees thatsales, marketing, and customer support areas are no less important than other areas becausecustomer-oriented

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culture has been found to have passive influence on CRM package adoption.To enhance the employees' focus on handling customer-related data, those company executivesshould draft a vision that the accurate, in-depth and readily-available customer data can facilitatethe decision-making process. A well-developed CRM-related information infrastructure wouldsupport customer relationship management at every customer contact point. To increase theemployees' knowledge on CRM technology, those executives need to educate employees on howto operate a CRM software package and what the benefits are from adopting the package. It canbe concluded that top management plays an important role in cultivating employees' positiveattitude about the CRM software package.The study findings are also applicable to the non-CRM advocating companies. Thosecompanies may lose their competitive advantage if more CRM advocating companies haveadopted CRM package. Non-CRM advocators are under pressure to catch up with this futuretrend of CRM package adoption. Although non-CRM advocating companies may engage fully indaily operations and be reluctant to find time to evaluate the need of a new innovation, it isadvisable for them to explore the stimulating factors of CRM package adoption to equipthemselves for launching a CRM package in the future without any surprises. To staycompetitive, executives of those companies need to know how to build a customer-orientedculture, how to increase knowledge (as well as positive attitude to) of CRM package, and how tobuild a desirable CRM-related information infrastructure because they are recognized as thegenerators of company-wide attitude to IT innovation adoption. This research provides avaluable insight for non-CRM advocating company top management on how to equip theircompanies on adopting CRM package.

Study limitations

Despite the valuable findings, there are three major limitations that should be addressed infurther studies. First, data collected from the mail survey provides merely a snapshot of theconcern in this study (i.e. Factors affecting MIS, EDI and CRM package adoption and the attitude of variousMIS, EDI and CRM functionalities). This is because the number of MIS, EDI and CRM advocators is limited and a largeproportion of respondents are not familiar with what MIS, EDI and CRM is. There is a definite need forundertaking longitudinal studies with the same research population to see if the identical result will be found over

time.Second, the result may suffer from common method variance because the data collectedwas from a single key informant. This study examined only the attitude of directors or projectmanagers. If respondents either do not take the process of completing the questionnairesseriously or they have a negative attitude towards the survey study, data collected might notaccurately answer the research questions. It leads to the possibility that the data reported by thesingle key informant may be overstated or understated. To overcome this problem, data isnecessary to be obtained from multiple key informants.

Third, the study is localized in manufacturing companies. The findings might not hold true for other manufacturers. It isadvisable to collect data from those companies for making a comparison between their attitude toCRM package adoption and various CRM functionalities and the contemporary research findings.Besides broadening the view on the study issues, a cross-country study could be held in order totest the stability of CRM package initiatives identified and the four developed groups globally.

Summary

Both findings of this study, potential indicators of MIS, EDI and CRM package adoption and thetaxonomy developed, were discussed briefly about its contribution to researchers andpractitioners. Thefour groups, developed and labelled with reference to Kathuria's (2000) study, have their ownattitude to various CRM functionalities.

This study is limited by three main components, merely localized study, "snapshot" ofresult obtained and single informant. Cross-countries studies, longitudinal studies, and usingmultiple informants are recommended to overcome those limitations. It can be concluded thatresearchers can conduct much more comprehensive studies in future based on the recommendedfuture directions.

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