

The impact of enterprise systems in management decision making

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Abstract

An Enterprise Resource Planning (ERP) system is composed of a basic transactional system and a management control system. Sammon et al. (2003) describes these 2 components of ERP systems as the solution to “operational” integration problems and “informational” requirements of managers. Thus, the extreme standardisation of business process inherent in ERP systems creates huge volumes of data without providing a clue for how to exploit it and may therefore not be beneficial from a decision-making point of view. In this paper, decision-making theory and models are reviewed, focusing on how an ERP implementation might impact on these constructs. This paper is an analysis about centralisation of decision making in an organisation and its impact on performance at a local level.

Keywords: ERP, ERP implementation, Decision support system, Decision making

Decision Making Models

Many researches in decision making focused on the difficulty of defining a rational model for an ever-changing process that also allows for the unreasonable or contextual factors that make up the innumerable decisions made by management in organisations. In Simon's (1972) theory for decision-making, he posits that a business tried to make a decision that was "good enough". He called his theory "bounded rationality" and invented a name to

describe it: "satisficing", a composition of the words satisfy and suffice

It is difficult to find whether management decisions can be structured into distinct phases (eg. intelligence, design and choice from Simon, 1977), or whether the complexity of factors influencing an individual decision will mean that there can be no pre-determined outcome

During an ERP implementation, we can expect many impacts at all levels in the decision domain:

- The roles and responsibilities of an actor need to be changed because of the re-assigning in the new template processes. At a minimum, their contribution may have to change towards less autonomy and less control.
- The decision process may have changed in that there will be new or modified sources of information and / or different steps to the process
- The decision itself may change as the system may have incorporated some of the conditions and exception traps which were previously dealt with manually. This may be perceived as less freedom or additional constraints by the decision maker.

Now the key concept of organisational learning is to question whether a decision is subject to encoding. Following the implementation of an ERP system, information that was tracked manually or not at all will now have to be recorded unambiguously in the system in order for automatic triggers to be activated allowing transactions to move on to the next stage in the process.

Aspects of decision making

Langley (1995) identifies 3 aspects of decision-making which render it a difficult subject for empirical research:

- Many decisions do not imply distinct identifiable choices, and are difficult to pin down, in time or in place
- Decision making processes do not necessarily proceed as a linear sequence of steps, rather they are driven by the emotion, imagination and memories of the decision makers, punctuated by sudden crystallisations of thought
- It is difficult to isolate decision processes, as decisions typically become intertwined with other decisions.

Gorry (1971) argues that the spreading out of information systems into higher management functions has resulted in blown up quality on information, at the expense of an emphasis on decision making models and their components – i.e.: constraints, goals and other parameters. He also explores the relationship that managers have with information and models design helps in reducing complexity to understandable dimensions.

Managerial models for decision - making

Interestingly, the implementation of an ERP system will only serve to aggravate this lack of managerial models for decision-making.

- Firstly, each ERP package uses operational models as underlying frameworks and these models can differ in terms of how they operate. Both Oracle and SAP are based on the principle of “work orders”, for example, which correspond to unique production jobs which consume inventory as they progress. However the manner in which they tie back to sales orders is different from one package to the other. Understanding and being able to communicate this new process blueprint and how it differs from the old way of working is a huge challenge for managers going through an ERP implementation.
- Secondly, managers may not initially understand the reasoning behind some of the configuration options embodied in the business template as implemented by the ERP project team. Only few project team members are interested in knowing the logic behind the configuration decisions that are made during the implementation stage, and furthermore, once implemented, users will usually be against from any course of action which implies changes to these decisions. This may reduce the scope of a managers decision domain.
- Thirdly, there is a wealth of information important for decision-making, which lies outside the traditional ERP boundaries (Stefanou, 2001). For example, information from external sources, such as published statistics, market data, and experts’ opinions are not easily accommodated within the ERP environment. Legacy systems may contain years of historic data that can be crucial in determining trends and patterns.

Managers require decision-making models to help them to interpret the complexity of the real world. ERP systems provide a huge volume of information to managers, but in so cases, adding more information may create a greater complexity to decision making at the management control level.

Moreover, the ERP vendors are more concerned with the notions of “best practice” and “zero modifications”, and not for the individual managers’

perception and processes. Equally the tight timescales for their implementation allows little boundary for questioning the corporate template. Hence managers

are expected to take on models that are not their own, with parameters they had little influence on, and deal with the corresponding increase in information volume.

Little's (1970) observations would seem to bear this out:

"People tend to reject what they don't understand. The manager carries responsibility for outcomes. He prefers simple analysis to grasp, even though it may have a qualitative structure, broad assumptions, and only a little relevant data, to a complex model whose assumptions may be partially hidden or couched in jargon and whose parameters may be the result of obscure statistical manipulation."

Pfeiffer (1992) discusses the selective use of information in management to rationalise decision processes, and how, under conditions of uncertainty, individuals would prefer to use data and decision-making processes "with which they are comfortable".

The organisation, must adopt a broader perspective like integrating mechanisms in increasing its information processing capabilities (Galbraith, 1974). The integrated mechanism in ERP systems allow routine and predictable tasks to be automated. This would equate with Winter's (1985) notion of routines or high volume mechanistic decision

Conclusion

Management decision making can be said to be made up of a combination of structured information "handling", and the application of knowledge based on information and experience that is unstructured. The application of highly integrated systems such as ERP to business activities is further evidence of the "evolutionary nature of the line separating structured

making, which implies the use of some sort of system.

The choices inherent in implementing and configuring ERP processes do, in effect, eliminate or suppress the choices to be made by process users (employees), thereby reducing the responsibility on employees to make decisions for day to day routine work. Taking procurement as an example, if Purchase Order approval levels are parameterised within an ERP such that certain PO's with amounts that fall within acceptable limits can be approved automatically (i.e. don't require manager sign-off), as long as they are from a recognised list of items from an agreed set of corporate suppliers (the only ones available in the system), then the decision making has been reduced to a mechanistic level. This will improve the efficiency of the procurement process by allowing faster PO approval for those "standard" items, and should yield monetary benefits as well, in terms of volume discounts from suppliers.

To perceive uncertainty in MIS is as "threatening rather than inevitable", and, rather than exploiting information for its "educative" (Gorry, 1971) potential, information systems professionals tend to design models that mask reality with "assumed certainties".

from unstructured decisions" (Gorry & Scott Morton, 1971).

We now know that it is very much expensive to build a system. Implementing ERP systems has not prevented 40% of companies in the world with revenues. The total market for ERP software has been estimated at \$1 trillion by the year 2010 (Bingi et al. 1999).

In spite of this strong push to implement ERP among today's business organizations, there is a lack of understanding of the real post-implementation benefits of these integrated systems, and more insidiously, little knowledge among adopters of the longer-term organizational impacts (positive or negative) that may result.

Research on ERP experience in industry suggests that the single most important factor in their successful implementation is the organisation itself, that is, the readiness of employees to embrace change. This is comprehensible, given that the alignment of resources to the new ERP enshrined business processes means that roles, responsibilities and

Fundamental research questions is

What models are used in the post-ERP organisation to identify and prioritise the problems which managers focus on?

ERP projects in research literature have been treated like large IS projects, using many of the analytical tools from traditional information systems research. Our approach to research in this area is to acknowledge that the biggest impact

therefore job descriptions will be impacted at the operational level

Researchers should strive to understand the longer-term effects of the impact of ERP systems on management decision-making. In evaluating the impact, the critical criteria will be the standardisation of processes and the centralisation of responsibility for decision-making.

Furthermore, as responsibility for decision-making tends to be more centralised in the post-ERP world, managers may find themselves with a perception of having less control over their decision domains, and with less autonomy to take new or different approaches to the resolution of issues

to the company has been on people and their jobs, and that these effects are better defined in terms of organizational change. Using constructs adapted from the study of organisations rather than the study of information systems will give researchers the lens to view ERP implementation impacts in the context of the bigger picture of organizational driving forces.

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