

**INTEGRATING KNOWLEDGE MANAGEMENT TECHNOLOGIES IN ORGANIZATIONAL BUSINESS PROCESSES****P.KRISHNA PRIYA<sup>1</sup> and K.BANU ROOPA<sup>2</sup>**

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**Abstract:** Initially KM was seen as an extension to Artificial Intelligence (AI) where knowledge was viewed as information: a commodity that can be codified, stored and transmitted. Expert systems were created to 'capture' the knowledge of experts. The 'capture' approach continued with an emphasis on 'capturing knowledge' in databases, manuals, books and reports, and then sharing it in a hard form. The emphasis was placed on managing so called 'knowledge assets' that were tangible, and could be structured and codified, such as patents, trademarks and documents. This view of knowledge as an object continues to dominate the KM field with some researchers still viewing the capture of knowledge as the main challenge for KM .

The specific focus of our analyses is on the application of KM technologies in organizational business processes for enabling real time enterprise business models. The RTE enterprise is considered the epitome of the agile adaptive and responsive enterprise capable of anticipating surprise; hence our attempt to reconcile its sense making and information processing capabilities is all the more interesting. However, our theoretical generalizations and their practical implications are relevant to IT and KM systems in most enterprises traversing through changing business environments. Real-time enterprise (RTE) business model designs for both successful and unsuccessful companies are used to provide real world understanding of the proposed framework.

**KEY WORDS:** Knowledge Management, RTE , Business Models

**Introduction**

The reach of know-how and experience possessed by individuals can be greatly extended once it is captured and explicated so that others can easily find it and understand and use it. In modern times, reports of activities, minutes of meetings, memoranda, proceedings of conferences, and document filing systems maintained by organizations are traditional commonly-used devices for recording content in paper format so that it can be transferred to others. More recently, electronic databases, audio and video recordings, interactive tools and multimedia presentations have become available to extend the techniques for capturing and disseminating content. The availability of new information technology,

particularly the World Wide Web, has been instrumental in catalyzing the knowledge management movement. Information technology may, if well resourced and implemented, provide a comprehensive knowledge base that is speedily accessed, interactive, and of immediate value to the user.

Knowledge management is the way in which organizations create, collect, and re-use knowledge to achieve organizational objectives. It is now widely accepted that knowledge management is the key to future growth and that with proper utilization of knowledge, an organization can significantly increase its efficiency and effectiveness. Knowledge management techniques, an organization can increase its productivity, effect

greater improvements in quality, cost and delivery. For these businesses worldwide are increasingly considering knowledge to be an asset must be properly managed and are introducing measures to reward its sharing the firm. However, it is also necessary to clarify beforehand what constitutes knowledge and it can be identified, gathered, classified, stored, accessed, protected, and shared. aims to answer some of the fundamental questions that need to be used by an organization to give more meaning and purpose to the implementation knowledge management using Information Technology

### **The Value of Knowledge Management**

In an organizational context, data represents facts or values of results, and relations between data and other relations have the capacity to represent information. Patterns of relations of data and information and other patterns have the capacity to represent knowledge. For the representation to be of any utility it must be understood, and when understood the representation is information or knowledge to the one that understands. Yet, what is the real value of information and knowledge, and what does it mean to manage it?

Without associations we have little chance of understanding anything. We understand things based on the associations we are able to discern. If someone says that sales started at \$100,000 per quarter and have been rising 20% per quarter for the last four quarters, I am somewhat confident that sales are now about \$207,000 per quarter. I am confident because I know what "rising 20% per quarter" means and I can do the math.

Yet, if someone asks what sales are apt to be next quarter, I would have to say, "It depends!" I would have to say this because although I have data and information, I have no knowledge. This is a trap

that many fall into, because they don't understand that data doesn't predict trends of data. What predicts trends of data is the activity that is responsible for the data. To be able to estimate the sales for next quarter, I would need information about the competition, market size, extent of market saturation, current backlog, customer satisfaction levels associated with current product delivery, current production capacity, the extent of capacity utilization, and a whole host of other things. When I was able to amass sufficient data and information to form a complete pattern that I understood, I would have knowledge, and would then be somewhat comfortable estimating the sales for next quarter. Anything less would be just fantasy!

In this example what needs to be managed to create value is the data that defines past results, the data and information associated with the organization, it's market, it's customers, and it's competition, and the patterns which relate all these items to enable a reliable level of predictability of the future. What I would refer to as knowledge management would be the capture, retention, and reuse of the foundation for imparting an understanding of how all these pieces fit together and how to convey them meaningfully to some other person.

The value of Knowledge Management relates directly to the effectiveness with which the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future. Without on-demand access to managed knowledge, every situation is addressed based on what the individual or group brings to the situation with them. With on-demand access to managed knowledge, every situation is addressed with the sum total of everything anyone in the organization has ever learned about a situation of a similar nature. Which

approach would you perceive would make a more effective organization?

### **Business KM**

Knowledge Management is a new branch of management for achieving breakthrough business performance through the synergy of people, processes, and technology. Its focus is on the management of change, uncertainty, and complexity. It evolved from the need for advancing beyond the failing paradigm of Information Technology Management that accounts for 70%-80% system failures. As 'IT' becomes more of a commodity and endowed with more complex 'potential' capabilities, there is need for re-focusing on strategic execution. As we transition from an era of information scarcity to information glut, there is need for re-focusing on human sense-making processes underlying decisions, choices, and performance. In this new paradigm for increasingly uncertain and complex business environments, dynamically evolving performance outcomes are the key drivers of how 'smart minds' use 'smart technologies' to leverage strategic opportunities and challenges

### **Real Time Enterprise: The New Knowledge Management**

Real time enterprises are organizations that enable automation of processes spanning different systems, media, and enterprise boundaries. Real time enterprises provide real time information to employees, customers, suppliers, and partners and implement processes to ensure that all information is current and consistent across all systems, minimizing batch and manual processes related to information. To achieve this, systems for a real time enterprise must be "adaptable" to change and accept "change as the process".

- trading analytics: from 30 minutes to 5 seconds;
- airline operations: from 20 minutes to 30 seconds;
- call center inquires: from 8 hours to 10 seconds;
- tracking finances: from 1 day to 5 minutes;
- supply chain updates: from 1 day to 15 minutes;
- phone activation: from 3 days to 1 hour;
- document transfer: from 3 days to 45 seconds;
- trade settlement: from 5 days to 1 day; and
- build-to-order PCs: from 6 weeks to 1 day.

One can see the impact of knowledge management everywhere but in the KM technology-performance statistics (Malhotra, 2003). This seems like a contradiction of sorts given the pervasive role of information and communication technologies in most KM applications. Some industry estimates have pegged the failure rate of technology implementations for business process reengineering efforts at 70 percent. Recent industry data suggest a similar failure rate of KM related technology implementations and related applications (Darrell *et al.*, 2002). Significant failure rates persist despite tremendous improvements in sophistication of technologies and major gains in related price-performance ratios. At the time of writing, technology executives are facing a renewed credibility crisis resulting from cost overruns and performance problems for major implementations (Anthes and Hoffman, 2003). In a recent survey by

Hackett Group, 45 percent CIOs attribute these problems to technology implementations being too slow and too expensive. Interestingly, just a few months ago, some research studies had found negative correlation between tech investments and business performance (Alinean, 2002; Hoffman, 2002). Financial performance analysis of 7,500 companies relative to their IT spending and individual surveys of more than 200 companies had revealed that:

- companies with best-performing IT investments are often most frugal IT spenders;
- top 25 performers invested 0.8 percent of their revenues on IT in contrast to overall average of 3.7 percent; and
- highest IT spenders typically underperformed by up to 50 percent compared with best-in-class peers.

The contrast between the outcomes-driven strategy-pull model and the input- and processing- driven technology-push model is even evident in the latest incarnation of KM under the moniker of RTE. Given the confusion between KM and KM technologies that resulted in the backlash against technology vendors, it is germane to point out a similar future for the proponents of RTE. There is an imperative need for making a clear distinction between the business performance capabilities afforded by the RTE business model and the technologies that are labeled as RTE technologies. As discussed earlier, success in strategic execution of a business process or business model may be accelerated with carefully chosen technologies. However, in absence of good business processes and business model, even the most sophisticated technologies cannot ensure corporate survival.

### **RTE business models**

Successful RTE enterprises focus primarily on the function of the business model that guides the choice of the infrastructure form for accelerating strategic execution. Unsuccessful RTE enterprises, in contrast, often meet their fate because of the misplaced belief that form could somehow compensate for the inadequacy of the function. Successful RTE business models may be apparent in virtual companies such as e-Bay that owe most of their functioning to social capital embedded in their users, buyers, and sellers. Successful RTE business models may also be apparent in companies with brick-and-mortar stores such as Wal-Mart. Regardless of the variations in form, most such companies share a similar but distinctive focus on their higher purpose, which guides their strategy and its execution. This observation perhaps explains how some companies achieved most sustained business performance with lesser investments in related technologies. Often their success was attributable to a differentiated business model based on strong ties with customers and suppliers rather than most recent investments in CRM and SCM systems. Strategic execution of the business models was accelerated with the help of technologies. However, successful companies had superior business models and a consistent track record of strategic execution as a precursor. Smart and selective investments in technologies afforded them the ability to do more with less by accelerating their business capabilities. Also, strong ties with suppliers and customers enabled them to spread the risk of investing, deploying, and utilizing the technologies with their partners and customers



*Figure 1 Strategic execution - the primary enabler of the RTE business model*

### Why do some RTE businesses succeed

The following cases were selected after reviewing the industry case studies of companies that were often described as benchmarks in terms of their RTE business models. Specific companies were chosen based on their visibility in the business technology press and popular media. The reviews of industry cases studies were guided by our interest in understanding the link between investments in advanced technologies and resulting business performance.

#### *Wal-Mart: RTE business model where technology matters less*

Some IT analysts have attributed Wal-Mart's success to its investment in RTE technologies. However, Wal-Mart has emerged as a company that has set the benchmark of doing more with less. Wal-Mart did not build its competitive advantage by investing heavily or by investing in latest technologies (Schrage, 2002). A McKinsey Global Institute reports:

The technology that went into what Wal-Mart did was not brand new and not especially at the

technological frontiers, but when it was combined with the firm's managerial and organizational innovations, the impact was huge.

More recently, Collins (2003) has predicted that Wal-Mart may become the first company to achieve trillion-dollar valuation within next ten years following the performance-driven model delineated and discussed earlier. In contrast to its competitors, Wal-Mart systematically and rigorously deployed its technologies with clear focus on its core value proposition of lowest prices for mass consumers. With that singular focus, it went about setting up its supply chains and inventory management systems to accelerate business performance. Long before anyone had heard about the RTE technologies, Wal-Mart was perfecting its logistic prowess based on the hub-and-spoke model of truck routes and warehouses underlying its inventory management systems. It was much later in the process when for its \$4 billion investment in its supply chain systems its suppliers invested ten times that amount to accelerate its RTE business model underlying its supply chain network (Schrage, 2002). The business model created the strong linkages with suppliers, which not only heavily subsidized the

costs of technology investments but also pre-committed the partners to the success of the shared systems. Simultaneously, given its retail channels, distribution network, and proximity to customers through market scanner data, it has preempted its suppliers from directly competing against it.

***Dell: RTE business model that does more with less***

Dell has developed and perfected its business model by developing strong ties with its customer base over the past 17 years. It perfected its business model over several years before accelerating its business performance with the aid of carefully selected technologies. It has cultivated outstanding relationships with its virtual supply chain partners including outsourcing providers (such as Solectron) and technology vendors (such as HP, Sony, and EMC). Dell also leverages its customer reach and range and market penetration for deriving commercial benefits from technologies developed by its technology partners. It has been developing and extending the real time logic over the past several years first for selling and servicing desktop computers, and later to aggregation and distribution of value-added products and services servers, storage, networking, printers, switches, and handheld computers. According to a survey of 7,500 companies conducted by Alinean (2002), Dell is a thrifty IT spender. Dell is equally frugal in its R&D spending (1.5 percent of revenues), according to a recent *Business Week* report, despite its continuing forays into new products and services. Through its alliances with partners such as EMC, Dell is able to leverage their research on product innovation while itself concentrating on perfecting the linkages with customers as well as suppliers. Dell's early innovations in passionate pursuit for being the low cost "build on demand" leader for consumer computing products has

yielded it the advantage of real time business performance. More recently, it has been able to accelerate the performance of its business model with the aid of carefully chosen technologies.

***GE: RTE automation for operational efficiencies***

GE views the real time movement as an extension of GE's renowned emphasis on Six Sigma quality drive. The business model defined for maintaining quality standards has been extended to control costs by minimizing response time to problems affecting products purchased by its customers. GE's CIO Gary Reiner tracks once every 15 minutes what he considers to be the few most critical variables including sales, daily order rates, inventory levels, and savings from automation across the company's 13 worldwide businesses. He acknowledges that it is neither feasible nor desirable to track all kinds of information in real time even with the aid of digital dashboards. Most operational information is tracked on daily or weekly basis while other kinds of information is tracked on an exception-reporting basis. The company claims operational savings of 35-60 percent in costs involved in customer response, customer service, and sales. Most of these savings are attributable more to management control rather than to technologies that are used to enforce pre-negotiated contracts on its buyers who deal with its various suppliers. Operational automation that is executed in terms of command and control logic seeking compliance has not been without its adverse ramifications. GE has encountered labor management disputes resulting from the workers who are not accustomed to minute-by-minute electronic surveillance.

***Cisco: real time enterprise technology troubles***

Cisco has been lauded for its RTE technologies since three years ago when its market cap was 850 percent of its recent market capitalization during

this year. The company prided itself about the RTE technologies that offered apparently seamless integration of real time data within and across its supply chain and customer ordering systems. The company had legendary faith in its technologies for predictive modeling and decision-making (Carter, 2001). In a *Harvard Business Review* article, the company's CFO (of that time) claimed that:

We can literally close our books within hours ... the decision makers who need to achieve sales targets, manage expenses and make daily tactical operating decisions now have real-time access to detailed operating data.

Unfortunately, real-time access to data could not be of much help when, buoyed by its unparalleled growth over several quarters, Cisco made some fundamentally incorrect assumptions about the future. Cisco ignored a key lesson of KM that is often ignored by many others: the past may not be an accurate predictor of the future. While other networking companies with less sophisticated technologies had cut back on production schedules months earlier seeing impending downturn in demand, Cisco stuck to the forecasts of their "virtual close" system that they considered invincible. As Cisco (or, rather, its technology-driven forecasting systems) had never been proven wrong before, their business partners saw little merit in trying to question their proven wisdom. As a result of misplaced faith in the power of the forecasting systems, Cisco ended up writing off \$2.2 billion in inventories and sacking 8,500 employees. Industry experts and analysts suggest that Cisco's write-off resulted from its blindsided over-reliance on its much vaunted "virtual close" systems. Cisco's case demonstrates that even the best technology offers no protection against bad management decisions, especially when the assumptions embedded in the dominant logic are

taken for granted. Some Cisco executives do maintain that in absence of the RTE "virtual close", the outcome could have been worse. Cisco retains its optimism in perfecting its RTE systems hoping they would eventually provide high certitude in the face of increasingly uncertain business environment.

### ***Enron: destroyed in real time***

Given the dominant and intensive role of real-time information, many of the technologies associated with real-time response were initially adopted by financial services firms on the Wall Street. Given Enron Online's primary business of exchanging and trading financial data, the real-time response model seemed like a match made in heaven. Enron planned to leverage its online exchange for facilitating direct real time instantaneous transactions in the online trading of energy market commodities. In its communiqué submitted to the Federal Trade Commission, Enron had emphasized that:

Efficiency gains made possible by dynamic pricing and trading are especially well suited to Enron's on-line business because electronic trading can match the speed with which commodity pricing changes. Transactions that used to take up to three minutes to complete over the phone now take just a second or two, including complex processes such as credit checks.

The company deployed Tibco's vaunted "RTE platform", sought out new technology wherever possible, and planned to spend hundreds of millions of dollars on technology infrastructure. The management control and oversight vagaries of Enron's management as well its insider- and self-dealings with fictitious entities are well documented in the records of the US Senate hearings as well as the public records of print and

broadcast media. *Post-hoc* analysis of Enron's RTE technologies confirms prior observations about the technology-push model (Berinato, 2002):

If these [accounting irregularities] hadn't come up, the IT inefficiency might well have come up to bite Enron ... Enron IT was as cutting edge as it was Byzantine. There were plenty of great tools, but there was precious little planning ... The core systems supporting the main revenue-generating activities were very disjointed ... There were major disconnects from deal capture to risk management to logistics to accounting. They all worked from different data sources ... They had teams and teams of people who had to comb through the data and massage it so that it made sense ... There was a lot of magic, transforming apples into oranges and oranges into apples. Preparing annual reports was a joke ... The breakneck deployment of state-of-the-art technology was done with little regard for a management plan.

When the cover about the collusion between Enron insiders and its auditing firm blew open, the RTE system triggered the freefall of Enron as it was also covering the risk exposure related to its instantaneous transactions. Unfounded and overly optimistic belief in technology as the means for generating profits despite an inadequate business model led to Enron's downfall resulting in one of the largest corporate bankruptcies in US history.

### **Conclusion**

Based upon our analyses, we counter-argued that the benefits attributed to the RTE technologies should indeed be attributable to the RTE business model. We further contended that in absence of an effective RTE business model, even the most expensive and sophisticated technology could not ensure corporate survival in the short- or long-term. The RTE case studies lent support to the primary

role of strategic execution as the lever for sustained business performance. As discussed, the successful RTE enterprises achieved their success by staying a step ahead of competition and by offering value propositions that inspired customers' imagination instead of playing the "me too" game in an already crowded market. These companies also selected and integrated ICT capabilities that fit directly with what they were deeply passionate about, what they believed they could be the best at, and what directly drove their steady economic growth. The successful RTE businesses did not adopt new technologies motivated by fear of getting behind. Rather, they thought differently about technology as an accelerator of business momentum and not its creator. Unlike the successful models of RTE enterprises, the failures were characterized by thoughtless reliance on technology often grasped as an easy solution, without coherent understanding of how it links to strategic execution for business performance.

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