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## MBA 4

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## “Company A: Implementing Five Drivers of the Knowledge Economy”

### 0.0 Abstract

“Company A” is an industrial manufacturing firm impacted by increasing competition and global economic slowdown. The company is weathering the most difficult period of its 100 year history, and is facing a potential survival issue. Whilst the management of the top-down hierarchy is highly averse to change, the parent company is in the process of rolling out a new ERP system mandating adaptation. The company has potential to implement five key drivers of today’s knowledge economy in order to address their declining organisational health. Company A has the opportunity to build a “knowledge culture” and knowledge-supporting organisational structure through internetworking. This will enable them to utilise “knowledge sourcing” techniques, including globalisation and re-intermediation, to feed into innovation, allowing them to leverage their knowledge capital in original ways through digitalisation and immediacy “knowledge operations”. In implementing these initiatives, there will be several barriers to change, including senior management buy-in and support, the change resistant corporate culture, poor communications structures and political barriers. However, through enabling these five drivers during the downturn, the firm may be able to improve their deteriorating health, nurture their core competencies and develop sustainable competitive advantage.

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## 2.0 Introduction

Company A is a small firm manufacturing large industrial products, suffering from heightened competitive rivalry combined with the impact of the global financial meltdown on capital purchases. For decades, their high margins were supported by their high market share, brand name and reputation for quality, but in recent years, the global market has opened up, and they are under threat from more than 150 competitors within their previously niche market. These new competitors are offering similar products at fractions of the cost. The challenge for Company A is to market their decades of knowledge and experience to leverage their core competencies in this area (Prahalad & Hamel, 1990).

Alongside this, they are also suffering from the macro environmental factors of reduced credit availability which has greatly reduced demand for their products. They have been forced to downsize their operations and lay off staff in order to remain stable. Furthermore, due to the poor flows of capital through the economy, customers are pushing for discounts. Due to the high cost structure of the organisation, even discounting beyond an economic level, global competitors are able to offer products at a significantly cheaper price.

The parent company is in the process of implementing a new ERP system with the aim of bringing the organisations closer together. Rather than look at the endemic cultural issues, senior management are hoping that the new system will address the issues in the competitiveness of the organisation. However, without looking systemically at the issue and resolving the root cause of the problems, it is unlikely that the ERP deployment will be able to save the company.

By analysing Company A for their competitiveness and their ability to adapt to five key drivers of the Knowledge Economy, several possibilities for change become clear. The eMatrix model from Prasena (2007) was adapted to select five key drivers selected as most applicable to Company A (Appendix A). These are Internetworking, "Knowledge Sourcing", Digitalisation and Immediacy and Innovation (Figure 1).

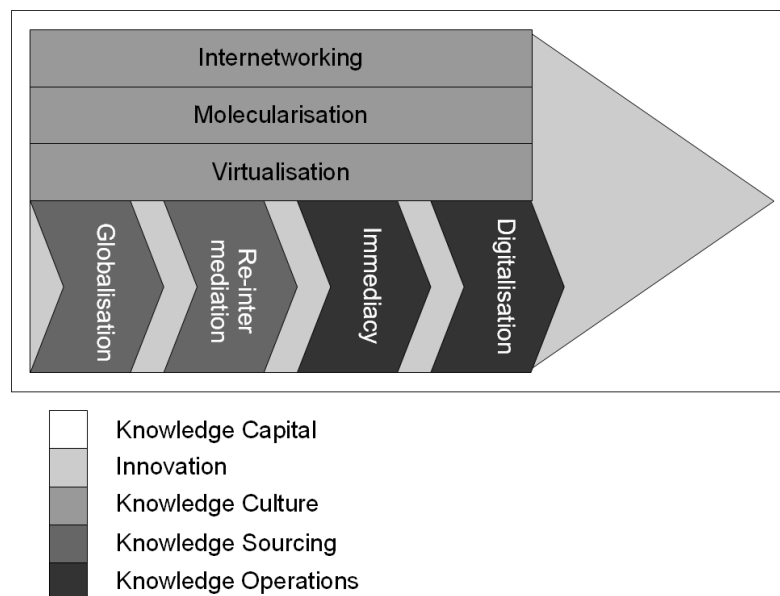


Figure 1 - Knowledge Value Chain (Adapted from Prasena, 2007)

## 3.0 Competitiveness, Potential and Readiness for Change

### 3.1 Internetworking

Internetworking is one of three central components involved in forming a "knowledge culture". A knowledge culture represents a knowledge-supporting organisational culture and structure, which is empowered to leverage globally, externally sourced knowledge and apply and capture it within processes and operations (Appendix A). Internetworking relates to the forging of external strategic partnerships across traditional barriers throughout the knowledge value

chain via the infostructure. At Company A, there is no provision for connectivity between suppliers, customers and only minor connectivity with the parent company. Whilst the purchasing department makes an effort to build relationships with suppliers, this does not extend to involvement with development teams.

There is potential for Company A to build a supporting organisational culture and structure to enable knowledge sourcing and operations through external partners. As the new ERP system is implemented, they could improve their linkages with external companies. The ERP will provide tools for supply chain management and customer relationship management, including supplier and customer portals (Brews & Tucci, 2007). However, at Company A, whilst there is an understanding of the importance of strong supplier relationships and interconnected companies, there is little understanding of how this can be achieved. By not building interconnected networks within their strategic supplier relationships, Company A are reducing their competitiveness.

### 3.2 Knowledge Sourcing

“Knowledge Sourcing” is the process of globally acquiring the optimal expertise and know-how at the optimal cost (Appendix A). Currently, Company A is operating in global markets, with a US parent company and a recent joint venture in India. They have also forged strategic alliances with distribution partners in remote regions providing access to local market knowledge and expertise which they utilise to sell into these specific regions. Although they have access to this knowledge, neither the infostructure nor the culture is in place to capture and store it within the organisation.

Company A has an extremely old fashioned approach to management, with a typical “Machine bureaucracy” top-down hierarchy (Laudon & Laudon, 2007). Whilst suggestions for improvement are raised within the firm, these are rarely taken any further by management. There are numerous competency carriers but the importance of these knowledge resources is not recognised (Prahalad & Hamel, 1990). These key staff members represent decades of expertise in their field but are highly under-utilised. Rather than leveraging their expertise to develop new products or innovative service offerings, they complacently support obsolete products. There is clearly scope for HR to utilise these skills in a more competitive fashion. Furthermore, the recent joint venture in India offers opportunities for sourcing knowledge and competencies in new fields and markets from this strategic alliance. After a year of alliance, there has been very little communication between the organisations, and they function as separate companies.

However, there are some signs of increased internal sourcing of knowledge from across the firm and improved competitiveness. The incoming ERP solution should greatly increase the availability of cross-border information. It should also improve communications and reduce the stagnation of information flows within business unit silos.

Moreover, there have been steps towards re-intermediation through implementation of a wiki internally and a frequently asked questions area on new microsites. The internal wiki was intended to be a storage area for ideas, concepts and suggestions; a knowledge repository for a molecularised community of practice (CoP) (Wenger, 2000). Initially, the system was open to all to contribute, and the uptake was strong. During the formative stages of the CoP dynamics, senior management, in keeping with the organisational culture, limited the openness of the site and contributions dropped. Now, the sole contributor is a marketing resource<sup>1</sup>.

Company A has also moved towards Web 2.0 by opening up a frequently asked questions area on their microsites to user-generated questions. However, uptake has been poor due to minimal holistic management support for the Web 2.0 initiative. This is evidenced by the fact that after a major overhaul of the main website, even though a support forum was one of the main requested features, it was not created, and the site continues to host only static data.

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<sup>1</sup> The impact of politics and organisational culture in Company A on the formation of the wiki-based Community of Practice has been considered in greater detail in Lynn (2008).

### 3.3 Immediacy

Immediacy is the first of two “Knowledge Operations” that Company A could implement. Knowledge operations are processes which can be utilised to acquire, capture, leverage, disseminate and distribute knowledge across an organisation (Appendix A). In terms of immediacy, Company A has little mobile infrastructure and little willingness to invest in new messaging technologies which are precursors to mobile deployments. Whilst external agents have remote access to the network via a VPN and webmail, they rely on internet connectivity provided by their hosts. External staff often request mobile email and broadband but the infrastructure is not in place, and investment in new messaging solutions is considered unjustifiable.

This low emphasis on communications infrastructure is epitomised by the poor communications both internally and within the supply chain. There is little emphasis on cross-boundary communications, and no strategic intent regarding information sharing on demand levels and expected delivery times with suppliers or customers.

Whilst this is the case, Company A has progressed on some levels. Their microsites offer RSS feeds for interested customers, and the ERP system should improve availability of the business tools. The company has also moved towards virtualising their physical organisational structure through holding remote meetings via Live Meeting and Skype.

### 3.4 Digitalisation

Company A has been slow to move into digitalisation. Information flows are still achieved by moving folders of papers between departments. Any particular work-in-process could be in any department on its route through the organisation. Whenever a member of staff needs to ascertain why there has been a delay, they follow the path of the product through the organisation until they find the folder. It is clear that these practices slow the flow of information through the organisation and reduce their competitiveness.

However, these arcane practices are improving. The paper folders used to be filed onsite, but over the last two years, they have been scanned into a database. After the products have been shipped, invoiced and paid, folders are sent to a scanning company for processing. A CD with the scanned folders and key data points encoded into a database is returned. Unfortunately, the archive scanning tool was chosen without thought to systems integration. All of Company A’s archived data is now stored in a proprietary format which can only be accessed through proprietary software. They also do not have any tools to edit or change the database. Additionally, the software will not integrate with the new ERP system, which will limit the flow of information through the organisation.

Despite these issues, the incoming ERP system should provide opportunities to reduce the dependence on paper filing systems and should offer tools for recording and acquiring knowledge. Through this deployment, the company has the potential to leverage knowledge throughout their operations strategy.

### 3.5 Innovation

Company A has been technologically uncompetitive for the last decade. The MD is Head of R&D and is heavily invested in the past and the traditional ways of doing things. The company has recently been forced to update some of its products due to component obsolescence, but rather than be prepared in advance and deliver an updated product, they reused their 15 year old schematics and redesigned it to work with replacement components. Furthermore, as yet, they have not implemented USB as a replacement for the RS232 serial port, whilst newer competitors have been offering USB technology for several years.

Company A’s old processes are no longer competitive. Abernathy and Utterback (1978) state that as a market becomes mature, innovation tends to move from product-based to process-based developments. At Company A process changes have been grafted on top of the previous steps, adding complexity levels, and reducing efficiency.

Alongside the ERP project is a concurrent plan to streamline the processes through a more moderate form of business process reengineering, removing all unnecessary steps. Whilst this will enhance the competitiveness of the organisation, without strong change management

efforts, the initiative could face significant user resistance (Davenport, 1995). Clearly, with out-dated products and processes, Company A will struggle to retain their competitive edge.

However, there are signs of potential and readiness for change in innovation. They have a new software platform and updated electronics in the pipeline and they are moving towards more modular designs and open source components. They have instituted a Marketing Analysis Group (MAG) to propose potential developments to the Head of R&D.

Table 1 summarises the competitive status of Company A with regards to their knowledge capital and their potential and readiness for change.

**Table 1 - Competitiveness, Potential to Enable and Readiness for Change**

Driver	Competitiveness	Potential	Readiness for Change
<b>Innovation</b>	2	3	3
<b>Internetworking</b>	1	4	3
<b>Knowledge Sourcing</b>	1	3	3
<b>Digitalisation</b>	1	4	4
<b>Immediacy</b>	2	2	1

Scale: 1 to 5, 1 = Very Low, 2 = Low, 3 = Medium, 4 = High, 5 = Very High

## 4.0 Recommendations

### 4.1 Internetworking

Internetworking is a key development through which companies can access available knowledge capital throughout the knowledge value chain, and, hence, build competitive advantage (Tapscott, 1996). Through building more interconnected networks between first, second and third tier suppliers and customers, Company A would be able to better manage their supply chain. Improving these information-based linkages between organisations will enhance competitive priorities of reduced lead time, consistent quality, customisation and low-cost operations (Brews & Tucci, 2004, Krajewski & Ritzman, 2004). By using the incoming ERP tools to offer online portals to customers and suppliers, or developing their systems to integrate further with their supply chain, performance could be greatly improved, as could transparency.

Over time, these tools would allow collation of a vast database of partner information, including buying trends, demand forecasting, and supplier performance. Although knowledge is the source of wealth in the new economy, information is one of the initial drivers of knowledge. By datamining partner information, relationships could be managed more efficiently and effectively with lower external co-ordination costs, building into stronger partnerships, narrower organisational scope and increased specialisation (Brews & Tucci, 2004; 2007).

Furthermore, through providing more integrated sales and purchasing tools, Company A could reduce their partner's costs of doing business (Porter, 2008). Company A should utilise the new technologies in the incoming ERP suite to leverage improved communications and integration of purchasing, forecasting, order tracking and project monitoring tools. They should use these information-based analysis tools to improve on lead times, on time deliveries and quality. Through these tools, Company A could add value throughout the supply chain, reduce their partners' costs of doing business, mitigate risks and improve profitability, all building into their own sustainable competitive advantage.

Company A could also consider developing an Internet-enabled self-monitoring tool for their products (Retkowski, 2006). Using open source technology and automatically building an online database of customers, Company A could offer a service to remotely monitor the performance and health of their products. By monitoring if a fault was likely to occur or if maintenance was required, Company A would be able offer preventative maintenance before problems arose, offering a highly competitive service value proposal. Additionally, if the

problem was software-based, or could be achieved through re-programming, this could be achieved remotely through these tools.

Moreover, through developing their partner relationships and internetworked design tools, Company A could engage in collaborative innovation (Rigby & Zook, 2002, Krajewski & Ritzman, 2004). Collaborative innovation can be achieved through leveraging strong networked linkages to involve partners early on in the design process. Through early supplier involvement there are opportunities for leveraging the competencies of strategic allies to their own benefit (Dowlatshahi, 1998). Typically, specific partner competencies can offer reduced development costs, fewer design flaws, cheaper materials and improved quality.

By embracing a knowledge culture, where knowledge is sourced and utilised across the value chain, Company A could become greatly increase their competitiveness.

## 4.2 Knowledge Sourcing

In order to build sustainable competitive advantage, Company A must develop a strategic plan for knowledge sourcing. This will require adopting a knowledge culture, an updated IT and communications infrastructure and a new strategic interpretation of the nature of the business and its core competencies at management level. Through a designing new knowledge sourcing strategy Company A will be able to access concepts, ideas and possibilities for new product and process development.

Company A's knowledge sourcing strategy should leverage the skills and competencies from within the organisation. This means identifying competency carriers and recognising the capabilities of other staff members. Competency carriers should be empowered to disseminate their knowledge throughout the organisation to deliver improved performance (Pralhad & Hamel, 1990). Particularly important is to leverage cross-border competencies between the Indian joint venture, Company A and the parent company. There is potential for organisational learning and cross-fertilisation through these strategic alliances. Increasing the speed of knowledge transfer through the organisation is likely to lead to greater innovation. Furthermore, in order to enhance contributions from staff across the organisation, Company A should aim to build a learning organisation (Senge, 1990). The company is "learning impaired" and suffers from a lack of empowerment for learning and change and an insular management approach, unwilling to explore best practices of other firms (Harper & Glew, 2008). They have poorly defined decisions rights, and the "passive-aggressive" organisation rarely engages in "decisive dialogue" (Neilson et al, 2005, Charan, 2006). Company A should utilise the upcoming ERP system change process to forge a catalyst for change, initiating an organisational restructuring which enshrines decision making rights across the company and an organisational culture that encourages and visibly acts upon contributions and dialogue at all levels. Through harnessing the collective genius of the human harvest, and putting in place these structures, an organisational learning culture can be achieved (Hill, 2008).

Another focus for their knowledge sourcing strategy is in leveraging the knowledge culture through partner re-intermediation (Pralhad & Ramaswamy, 2000). Whilst there have been minor attempts to involve customers through the microsites, Company A has made little attempt to source knowledge or co-opt competencies externally. They should provide a support forum, and reengineer their support function so that all incoming support emails are rerouted to the forum. This would have several benefits for the company. It would drive customers to the forum, using their customer base to generate content, building a searchable knowledge base. It would identify common problems which could be shared with suppliers and developers and would increase page rankings in search engines by more closely associating the brand with the industry. It would also provide tangible evidence of the quality of service provision.

Over time, as the levels of content developed, with appropriate support, the site would begin to bring interested external parties and form a community or tribe (Godin, 2008, Shirky, 2008). Through connecting interested parties with one another, crowd sourcing becomes possible. Encouraging participation in the online community can lead to reduced support costs through outsourcing components of the support function to the community. It can also lead to improved customer satisfaction through increased involvement, a stronger brand and another

source for inspiration, innovation and product design ideas (McKay, 2009). By capturing the experiences of customers using the products daily, both positive and negative aspects can be identified and fed back into the R&D team.

There are also potential downsides, including poor feedback from angry customers or inefficient service provision. Whilst it is rare for a company to want customers to see these negative comments and opinions, with effective monitoring of the forum, a negative customer experience can be turned into a positive one. Additionally, participating with the community in a dialogue about product design problems and quality issues, useful information regarding possible improvements can be acquired (Kaufman, 2008).

Furthermore, there is potential to feed into innovation and enhance development speeds through open sourcing software and firmware. As Raymond (1999) argued, whilst there are benefits to the open source model, this means a change in business model. In Company A's case, their situation is similar to Raymond's "widget frosting", where hardware companies outsource driver development costs to the community. However, Company A does generate revenue from their software and, whilst their current software is outdated, their anticipated new release should provide a significant differentiator.

Company A could also consider the loss leading market positioning model; open sourcing the software to gain greater market penetration for their industrial products. The software is effectively useless without an industrial product, so greater software market penetration could increase hardware sales. However, the software has been written so that it can work with competitor's products, so by open sourcing, competitors could sell their own products based on Company A's software-based differentiator.

Company A could use a license with a similar clause to 3.2 of the Yahoo! Public License, where redistribution requires retention of "copyright, patent, trademark and attribution notices", to ensure that their brand was associated with the software (Yahoo!, 2009). They would also need to forecast the increased software market penetration and its anticipated impact on hardware sales. Also, Company A should project the cost reductions of open sourcing the software and its impact on innovation and development in order to make an informed decision as to whether they would experience a net benefit from open sourcing their software.

Another form of knowledge sourcing involves the supplier relationship component of the internetworking driver. This has been addressed in the Internetworking section.

### **4.3 Immediacy**

Immediacy has become a driver of the knowledge economy as communications tools have improved and mobile devices have become net-enabled, building into a virtualised Knowledge Culture. This has improved information flow, and has increased consumer expectations for reduced lead times, faster deliveries and generally increased speed of doing business. Company A has not deployed these technologies to accelerate the flow of information to customers, suppliers or employees, however, there are several opportunities within this realm that they could exploit.

Through developing their online profile Company A could provide more immediate feedback to their customers. The incoming ERP solution will track orders as they progress through the business using bar code scanning. This data will initially be used internally to manage the efficiency of the process. The ERP system also provides a web portal that will enable users to track the progress of their orders. Through this tool, users will be kept apprised of their order status. This concept could be extended by linking an RSS feed to the barcode scanning. By allowing customers to subscribe to these RSS updates, as the product progresses, the information will be delivered to the customer (Kaufman, 2008).

Furthermore, by enabling the remote workforce with mobile internet capabilities, Company A would be able to increase the velocity of information within the organisation. Through a combination of push email and enabling the incoming ERP tools with mobile broadband communications technology, remote staff would be able to act on changes in the environment as they occurred. Through this level of empowerment, the organisation could react quicker to

customer needs and supplier pressures, and effectively becoming more agile (Lee & Lau, 1999, Keil, 2009).

#### **4.4 Digitalisation**

The challenge for Company A with regards to digitalisation is not only to move away from the current situation of paper trails around the organisation, but also to find ways to capture and store knowledge to feed into innovation and knowledge sourcing. Through the sourcing strategies and innovation tools, knowledge should be surfaced. It then needs to be captured, digitised and redistributed through the organisation and externally.

The first issue of the information flow through the organisation being processed as folders of paper passing from desk to desk should be addressed by the incoming ERP system. It will reduce this dependence on paper-based systems by ensuring that all steps within the production process are linked into the database. Theoretically, all note-taking and critical information should be stored in the system and accessible instantly across the entire organisation. Once this process has been achieved, with all new data generated within the order fulfilment, customer relationship and supplier relationship processes stored in the same database, information will flow more quickly around the organisation. Neilson et al (2008) found that the second most important trait within effective organisations was related to the velocity of information flow. Thus, through this incoming change in the infostructure, Company A should improve their competitiveness.

The second issue of capturing the surfaced knowledge also requires extensions to the infostructure. As discussed earlier, this can be achieved through tools such as the wiki, or a forum-based knowledge base. However, there are extra challenges involved in encouraging recording the surfaced knowledge. It is necessary to build a culture where knowledge sharing and is recognised and rewarded. Knowledge sharing tends to be better incentivised through attribution and peer recognition rather than monetary incentives (Brown & Duguid, 1991; 2000). To be successful, Company A must work to create a knowledge culture that nurtures creativity to achieve knowledge acquisition and digitalisation.

In order to provide a process for storing, assessing and acting upon employee, customer and supplier contributions, it is necessary to implement a supporting information and communications system. Initially, this could be achieved through an open area on the wiki, but it would be necessary to provide a more structured format for inputting suggestions, for a transparent process for action on the feedback. For the community to remain engaged, it is important for there to be evidence of involvement and action from the organisation. Through implementing tools such as user rating systems along with feedback from the company these forms of knowledge sourcing tools will be viable.

#### **4.5 Innovation**

Innovation is central to delivering sustainable competitive advantage. It is achieved through applying the capabilities, competencies, knowledge and know how of an organisation to enhance performance of processes, products or services. A knowledge sourcing strategy will contribute to enhanced innovation, as will building a knowledge culture across the organisation. This should be combined with forming communities of practice, an institutional emphasis on experimentation and a more structured approach to NPD.

Company A should aim to encourage the creation of communities of practice internally, externally and virtually (Wenger, 2000). These molecularised organisational forms support knowledge sourcing and innovation by providing space for experts, competency carriers and passionate individuals to gather together and form working groups structured around particular issues, topics and areas of focus. Through these groupings, a fertile ground for cross-fertilisation of ideas is formed, potentially leading to insights which can be applied to achieve innovation. Community members exposed to cross-boundary knowledge brokering practices, when operating beyond traditionally delineated functional lines are more likely to deliver strategic insights leading to innovation (Brown & Duguid, 1991).

Experimentation is essential for enabling innovation. In order to avoid strategic errors of omission, failure to take advantage of an opportunity, Amazon aim to “maximise the number of experiments [they] can do per given unit of time.” (Kirby & Stewart, 2007). Through this process, they aim to exploit as many innovation opportunities at the lowest cost as possible. By aiming to increase the numbers of ongoing experiments, Company A could increase the chances of identifying a breakthrough innovation.

Company A also need a more structured new product development (NPD) strategy (Wheelwright & Clark, 1992). By building a project plan, focusing on delivering product platforms from which they can build a wide range of product offerings, Company A would be able to improve their rate of development. Through planning delivery dates and cycling their development team amongst different projects, there is an opportunity to disseminate organisational learning and competencies between developers.

Furthermore, by modularising products, and aiming to reduce the overall number of components, Company A could reduce costs and improve competitiveness. Through offering a platform product, the major components remain the same, though specific extensions to the initial platform change. This will simplify the assembly procedure, reduce the purchasing and inventory costs and reduce lead time. Again, early supplier involvement in the development process can help with these goals. By using these tools for innovation, Company A can hope to increase its competitiveness through an accelerated development process with combined with reduced prices. These innovative tools can then be applied to the operational side of the knowledge economy.

## 5.0 Challenges

Company A will face several challenges in implementing these change initiatives towards competitiveness within the knowledge economy. These challenges include cultural and political barriers, senior management issues, communications difficulties and HRM and training problems. These will be addressed below.

In order to re-engineer the business to adapt to the new drivers of the knowledge economy, Company A needs to adopt a culture of change throughout the company (Senge, 1990). Since the incoming ERP solution will act as a key enabler for many of the knowledge operations recommendations and is already in the deployment phase, these objectives should be most easily achieved. However, without appropriately managing the cultural and human resources aspects of change, there is a risk of inadequate change management, reduced user training, poor transfer of skills, and for the change not to sufficiently “bed in” (Kotter, 1995, Performance Point, 2007). With large systems implementations, the system itself can often be seen as a panacea, but for a successful deployment, addressing underlying cultural issues is also necessary. All stakeholders need to be made aware of the need for change. By leveraging the impact of the downturn, the downsizing and the lay offs to emphasise that a successful outcome is a survival issue would establish a sense of urgency and help drive the change (Kotter, 1995).

This requires strong leadership from the senior management, alongside clear communications of objectives, realistic targets, milestones and short term wins (Kotter, 1995, Nah et al, 2001, McManus & Wood-Harper, 2007). With the current ERP deployment, there is little support from the UK senior management team. Whilst there is a project manager in the parent company in the US, there is no individual with key responsibility for the deployment in the UK. This has meant that there has been no clear and consistent message from the senior management to communicate the vision or the importance of the change (Kotter, 1995; Wagstaff, 2006). Management should be utilising top-down information dissemination strategies to keep the employees aware of how the project is progressing, sending out weekly email updates, and sticking up posters about the change initiative. Furthermore, change champions and “key influencers” from each department should be seconded and provided with key information and support to evangelise the change within their teams (Kim & Mauborgne, 2003).

Further, from a political viewpoint, the senior management who should be tasked with supporting the change have most power to lose from the change as they will no longer have control of information flows and the hierarchy will become flatter (Kim & Mauborgne, 2003; Laudon & Laudon, 2006). The pervading sentiment amongst the employees is that the senior management within the UK are not acting to address the issues related to the downturn or

acting with urgency to accelerate the deployment of the ERP. The US project manager should second a key influencer to manage the project in the UK with responsibility and accountability for bringing the deployment back on track. By empowering an individual with decision making rights over resource allocation, training and communicating the vision, they could lead the demoralised workforce to increasing involvement in the deployment. By forging a culture of empowerment across the organisation, employees may be more inclined to change and adapt to the new economic realities of the external environment.

The ERP initiative is also experiencing user resistance in the implementation period, due to minimal end-user training (Lapointe & Rivard, 2005). The employees fulfil the processes enabled by the ERP, so without quality training, there is a risk that there will be reduced benefits from the deployment. Unfortunately, due to slipping deadlines and the project running over-budget, the training aspect has been neglected, but time saved in implementation may be lost as employees are unable to perform their role after deployment (Performance Monitor, 2007). One way to support end-users is to address the training function from an internal service perspective, providing support as if they were external customers, since this should increase awareness of the importance of quality (Whyte & Blytheway, 1996). Additionally, personnel in the UK office require face-to-face training from the consulting partner company, as currently, they have only been offered e-learning tools, which they feel have had limited effectiveness.

Whilst the ERP project is undergoing difficulties, there has been considerable investment in it, and a successful implementation is one of the core strategic objectives of the organisation. As such, it is likely that with appropriate focus on cultural, political and HR aspects of the project, the deployment will have a successful outcome. Through this implementation, several of the knowledge operations recommendations should be achievable.

Additionally, there are likely to be cultural, political and senior management barriers to implementing knowledge culture, knowledge sourcing and innovation recommendations. The MD has strong emotional attachment to the traditional ways of doing business and the innovations that he helped develop 15 years ago. He is highly change averse to the extent that he blocks trialling different suppliers for generic components and has a "Not Invented Here" attitude towards external knowledge (Chesbrough, 2003). He is also incredibly mistrusting of all information systems initiatives, believing that "the world was a better place when everyone knew how to use a pen and paper". The culture is one of top-down hierarchy and does not empower employees across the organisation towards continuous process or product improvement. These rigid viewpoints limit the potential for Company A to benefit from innovation-focused knowledge sourcing internally or from internetworking for early supplier involvement or from customer sources.

In order to implement these recommendations, it would be necessary to convince the MD of the potential benefits of the initiatives (Standish Group, 1994; 1999; 2001). Without top executive support for information-based projects, direct communication of goals and objectives and management of change and culture, there is evidence for high rates of change initiative failures. To convince the MD of the potential benefits, it would be necessary to identify the issues that the MD recognises in the business. Company A has financial issues due to the downturn, stagnant product and process development, slow time-to-market and regular delays in lead time.

Knowledge sourcing through Web 2.0 models, software development through open sourcing and process and product development through internetworking and internal empowerment requires minimal investment except in the change of culture, but could outsource much of the cost of development to external partners. By crowd sourcing support via a forum, there would be clear time savings for service personnel who could be reallocated more profitably to other billable support areas. Evidencing expected ROI and saved R&D costs alongside forecast improvements in time-to-market through reuse of software in rapid development models, would also help attain buy-in at the top level. Alongside that, working with the MD and MAG to identify strategically important innovations and build them into the project plan to focus developer time and attention on key objectives should deliver clear time-to-market enhancements and win support from senior management. Additionally, the incoming ERP system by its nature should flatten the hierarchy and increase internal knowledge sourcing, leading to a more molecularised culture. Whilst this should enabling continuous process improvement and associated cost savings, it also entails difficulties of cultural change.

Through working to achieve senior management support for these initiatives, and aiming for cultural change towards a knowledge culture to develop a more dynamic, open, accountable and empowered organisational design, Company A may be able to achieve a turnaround in their fortunes.

## 6.0 Conclusion

The issues facing Company A of increasing competitive rivalry, the economic downturn and the impact of the decreasing competitiveness of the product portfolio are all combining to reduce the health and stability of the organisation. They are only lately beginning to adapt to the new knowledge economy, and as such, their performance as an organisation has been declining. However, through developing and exploiting their available knowledge capital and successfully implementing the recommendations of building a knowledge culture, supporting knowledge sourcing and operations and feeding into innovation, Company A should be able to adapt to the changing environment.

There are several barriers to implementation and Company A currently scores fairly low on the competitiveness scale for each of the key drivers. The traditional, hierarchical organisational culture, uncertain decision making rights, low velocity of information through the company and the senior management attitude towards change, alongside an inconsistent message and a poorly communicated vision all combine to form obstacles to change. There is evidence of potential and readiness for change. The ERP initiative mandated by the parent company should address several of the central failings of the current strategy, but that deployment in itself entails risks. Given the current culture and the political issues surrounding the deployment of new technology, achieving change in this organisation could be highly problematic. There is evidence of growing strategic dissonance as Company A moves towards a Strategic Inflection Point (Burgelman & Grove, 1996). The apparent strategic intent of Company A and their strategic actions are becoming increasingly divergent. At some stage, the pressures of the external environment will force change in strategic action, moving into alignment with strategic intent. Whilst this will require considerable change in cultural and senior management perspectives, it is the only viable alternative for a company already facing a survival issue.

There are several recommendations for Company A to better leverage their knowledge capital. The company would benefit from building a knowledge culture, initially particularly focused on internetworking to form strategic partnerships throughout the knowledge value chain and with customers to form a supporting structure for both knowledge sourcing and operations. They should also develop a knowledge sourcing strategy to determine how to leverage internal competency carriers across company barriers, how to co-opt the competencies of partner companies, how to crowd source support, open source development and open up innovation. Finally, they should work to find effective ways to integrate knowledge assets into their operations, by using digitalisation to capture and store knowledge and immediacy to disseminate and deploy knowledge to the boundaries of the organisation and beyond. Company A already has numerous knowledge resources at their disposal, they have not developed a supporting culture to enable and utilise them. They should focus on building a knowledge culture, developing a knowledge sourcing strategy, leveraging their knowledge operationally and successfully deploying the ERP system in order to create an organisational climate whereby knowledge, competencies and expertise become the driving forces of growth and sustainable competitive advantage.

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## 8.0 Appendix A

The Prasena (2007) eMatrix drivers includes Knowledge, Digitalisation, Re-intermediation, Immediacy, Innovation, Internetworking, Molecularisation, Virtualisation and Globalisation. When considering the five most relevant drivers to Company A, it appears that within today's economy, each of these interrelated drivers is a facet of knowledge and knowledge capital, the key generator of wealth in today's society (Senge, 1990, Garvin, 1993, Jeníček, 2006, Nonaka, 2007).

In order to gain the optimal benefits from knowledge capital, the organisational structure and culture needs to be adapted to provide a support for the new economic drivers.

Internetworking, molecularisation and virtualisation are each different aspects of a paradigm shift in the organisational structure and culture required to best support acquisition, capture, storage, usage, dissemination and deployment of the knowledge capital available to a company.

Internetworking represents extending the organisation beyond typical boundaries, deeper into the supply chain, by creating links and relationships between suppliers, customers, the organisation and the community. Internetworking leads to re-conceptualising the organisation not as wholly independent, self-reliant islands within a sea of competition, but rather as one of many interrelated, cooperative networked clusters of partners, with a flexible dependency on the network, sharing key areas of know-how, competencies and expertise. Through this understanding, the internetworking allows the organisational structure to be formed accessing cross-boundary knowledge and enabling that access within the infostructure (Tapscott, 1996; Chesbrough, 2003).

Molecularisation is a congruent concept for forming an organisational structure geared towards sourcing and utilising knowledge assets internally. It entails redesigning the organisational structure to flatten the hierarchies, forming smaller teams of empowered workforces with responsibility and accountability for enhancing and improving products, processes and performance. Through creating a culture of empowerment, the organisational structure will encourage internal knowledge contributions (Wenger, 2000, Laudon & Laudon, 2006). Virtualisation supports the extension of the organisation beyond not only traditional barriers, but also physical barriers. By providing an interface into the organisation through virtual portals and opening up the infostructure to remote access, the organisational structure must support a variety of flexible working arrangements, including working from home, supporting partner contributions and communications across a dispersed environment (Tapscott, 1996; Wenger, 2000; Krajewski & Ritzman, 2004).

Together these 3 drivers can be seen as representing the collective changes required to build a knowledge-supporting organisational culture and structure or "Knowledge Culture" (Figure 1). A knowledge culture supports knowledge sourcing, operations and innovation, through which knowledge assets can be acquired, captured, stored, utilised and deployed.

Globalisation and re-intermediation can be addressed together as the single driver "Knowledge Sourcing". From the perspective of the knowledge economy, globalisation has progressed through several stages. Globalisation initially took the form of manufacturing physical goods in offshore locations to access to cheap labour (Daruvalla, 2003). Over time, this developed into outsourcing non-core service components of the business to external organisations which could deliver better quality and performance at lower cost through inexpensive labour, economies of scale and increasing returns to knowledge (Choucri, 2007). Through offshoring, sourcing knowledge and competencies could be achieved at a much reduced cost in comparison to local markets (Knowledge@Wharton, 2004).

As the communications and collaboration tools on the Internet have developed, new ways of sourcing knowledge for innovation have become possible. Sourcing knowledge, skills and innovation through open sourcing development allows for massively reduced research and development costs. Equally, by bringing the customer further into the organisation, as supported by internetworking, providing internet-based communications tools, such as forums and wikis, allows closer relationships between business partners. It allows the community to intermediate in support needs and contribute to product development concepts. Through Web 2.0 and user-generated content, companies are able to crowd source knowledge at minimal cost, whilst building customer satisfaction and brand loyalty (McKay, 2009). Furthermore, development and innovation costs can be opened to a global knowledge market through open sourcing software code. Through open source, software has greater market penetration, and

potentially a greater number of developers contributing to fix and extend the software (Raymond, 1999). In this way, knowledge sourcing, globalisation and re-intermediation can be viewed as the process of acquiring knowledge and competencies at the optimal level at the optimal cost from across the globe.

Additionally, Digitalisation and Immediacy can be seen to represent operational methods to improve the velocity of knowledge throughout the organisation. Digitalisation is a way to capture, store and disseminate knowledge. Immediacy leverages recent developments to distribute knowledge faster and more efficiently. By enabling competency carriers to disperse knowledge through the firm faster, the resources contributing to sustainable competitive advantage are more effectively provisioned across the organisation (Prahalad & Hamel, 1990; Neilson et al, 2008). Together, these drivers can be considered to be “Knowledge Operations”.

Moreover, with knowledge as the central source of wealth generation, innovation is the output of that resource. Each of the different knowledge drivers fuel and are fuelled by innovation. Innovation is generated from the application of knowledge, skills and competences. When knowledge is sourced from global and intermediated sources, they provide a rich and diverse platform for product and support ideas, concepts and possibilities. Equally, as innovation is applied to the knowledge operations drivers, new and original ways to deliver knowledge, information and services both internally and externally become available. Each of these interrelated drivers offers opportunities for innovation and improved performance and quality. These innovations, knowledge sourcing and knowledge operations can only be fully realised within an organisational structure and culture which supports and enables these drivers, as exemplified by the knowledge culture.

When taking a Schumpeterian (1939) view of economics, business cycles are driven by innovation. On this basis, Friedman's (1970) famous aphorism can be adapted to “The social responsibility of business is to increase its innovation”, rather than its profits. In this way, leveraging knowledge within the organisation through key drivers, leading to increased innovation and growth, a corporation becomes at once more effective, and also more socially responsible. In this analysis, innovation becomes the driver that powers growth within the knowledge economy.

Together these concepts when applied to the eMatrix produce the model in Figure 1. From this, the five key drivers most applicable to Company A are the Internetworking component of knowledge culture, knowledge sourcing, immediacy and digitalisation components of knowledge operations, and innovation.