PERCEPTIONS OF THE KNOWLEDGE-BASE ECONOMY IN EXECUTIVES FROM SELECTED INDUSTRIES

What does the knowledge-based economy mean? Video interviews and its unique web-hosted database platform, was used to perform a qualitative study of perceptions by a variety of business executives. Five themes emerged. While the value of knowledge is well appreciated, many fear technology, even though it is not a source of competitive advantage in its own right.

Introduction

What is this thing called the knowledge-based economy and how does it affect business practitioners? The term falls off the tongues of policy-makers, academics, economists and journalists. Presumably, it affects every aspect of current business practice and will continue to do so for the foreseeable future. Simplified, the term ‘knowledge-based economy’ signifies a shift from an economic base in manufacturing to one of service provision. Clearly, consumption has not declined in concert with this shift away from manufacturing. The converse is likely: consumer consumption has increased. It is rather employment in developed countries that has swung from production of tangible goods to services delivery. In more sophisticated terms, production is focused on the creation of knowledge and knowledge-based products, such as communication technology and other technologies, automated systems that enable less labour-intensive manufacturing and myriad products consisting of compilations of information. The embodiments of the knowledge-based economy, as discussed below, are reflected in the economic base, workforce characteristics, technology development, technology-based corporate assets and the deployment of technology.

Peter Drucker is credited as the originator of the term 'knowledge society'. In 1989, he described the 'post-business society' in which workers would all have university educations, careers in information-based businesses and share characteristics of independence and mobility within the work force. In the 1990's, the knowledge-based economy could be characterized by tangible observations of its predicted elements, such as increases in the creation of intellectual property (IP), number of businesses possessing IP assets, fraction of GDP from such industries, and number of service workers. However, methods for valuing knowledge-based enterprises were still evolving and at the time included such factors as Research

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and Development (R&D) spending, numbers of knowledge worker employees, and number of intellectual property assets such as patents. For example, Cole (1993) cites facts such as in 1993 more people in Canada were employed in the computer service industry than auto manufacturing and predicted that technology creation would soon dominate the economy. "The new economy is based on harnessing of knowledge." Knowledge workers included professionals such as physicians and lawyers, scientists and senior managers (Cole, 1993: 52).

Not all agree that special denotation should be give to the 'knowledge-base' of the economy, or that anything new has really happened to our economic engines. Eisenhardt and Santos (2001) see knowledge-based valuations or competitive advantage as traditional resources in the resource based view of the firm. On the nature of knowledge workers, in Hammer, Leonard and Davenport (2004), the contention is presented that the value these workers contribute to the firm lies in old fashion tacit knowledge that develops from experience. It is also suggested that the knowledge workers of today are a little different, with a desire for autonomy and independence in determining how their job will be done.

Currently, although there are signals that support the existence of the knowledge-based economy, it remains difficult to achieve a direct correlation between those factors considered to be an integral part of the knowledge-based economy, such as R&D activity or expenditure, in proportion to scientific discovery and eventual contribution to GDP. An interesting explanation is offered by Britain (2007) for this particular discrepancy between an expected facet of the knowledge-based economy and observation. This researcher suggest that the required R&D time and spending is far less in service-based products than goods. It is notable that innovation is a concept intimately tied to the advance of the knowledge based economy, although one could imagine plenty of knowledge-based commerce in the absence of innovation.

On a macroscopic level, characterizations of the knowledge-based economy suggest a change in the general character of the workforce, as well as a shift in the basis of economic production. This was summarized by Hamel and Prahalad (1996) in a commentary outlining what they perceived to the impact of the new economy. They referenced the difficulty of managing knowledge workers, the paradigm shift to valuing youthful experience over old, the lack of permanency of employment and its implications, globalization effects, and valuations shifting to an intangible basis.

Ohmae (2005) prefers to focus on globalization as the most significant change in the world economy over the past two decades. However, technology and knowledge are central to his discussions of the evidence, causes and effects of globalization. For example, he recognizes a visionary in the banking industry as one who believed the future of banking relied on the acquisition of technology. Or, in the beginning of a discussion on outsourcing, he states "It is now obvious that in the first half of the twenty-first century, wealth can be created by human resources, as long as they are sufficiently intelligent and educated. Wealth and jobs can be imported and exported using the Internet protocol across national borders" (Ohmae, 2005: 65). Anand and Parashar (2006), while writing about the impact of internet communication technologies (ICT) on rural business development in India, reflect on aspects of the knowledge based economy and suggest that the novelty is in the use of ICT to transfer and distribute knowledge, rather than a novel basis to the economy. They state: "Broadly, ICT has facilitated the death
of distance at three levels - physical distance, psycho-social distance and cultural distance." On the impact of ICT on small, rural business, they write: "The cultural memory interacts with digital memory and that interaction is likely to strengthen the knowledge base of organizations" (Anand and Parashar, 206: 85).

Knowledge, knowledge workers, technology, service provision and technology creation are intertwined concepts related to the knowledge-based economy. What is known about how the evolution of each of these factors affects current business practice and practitioners? Arguably, advances in technology, particularly electronic communications technology, have changed the way every business operates. Some traditional businesses, such as the music, real estate and travel industries have experienced paradigm shifts in business model fundamentals. Other industries, such as investment banking and market research, while ostensibly in the same business, have experienced a significant change in the format of their product and the basis of competitiveness within the sector.

Weinberger suggests that the paradigm shifts in the 'digital economy' are brought about by two overarching principles related to the general availability, ease of access and ease of re-collating information into multiple different forms. The possession of knowledge is no longer the competitive advantage that it once was, and in fact, corporations such as Goldcorp can derive competitive advantage from sharing knowledge which could be kept private. He posits that knowledge is becoming commoditized, and "since the commoditization of knowledge includes its easy accessibility, business loses one of its traditional assets" (Weinberger, 2007:215). Second, there has been a power shift away from producing corporations to their customers. Quoting Yale Economist Yochai Benkler, he suggests "the Web...provides more equality than 'the one way structure of the commercial mass media" (Weinberger, 2007: 202). This has resulted in both opportunity and threat. New business models which essentially rely on knowledge aggregation and presentation, like Travelocity have emerged, while certain traditional models, like CD music sales have declined towards obsolescence. He believes we are "making knowledge our new currency" (Weinberger, 2007: 209).

Based on a review of the literature, another set of scholars examine the paradox that the use and transmission, including codification, of tacit knowledge may reduce its strategic value by making it more imitable, in essence by making it less tacit. These authors suggest the use of technology to transfer knowledge may maintain the strategic advantage, but only if the transferred information is not codified. To quote: "We are left with the somewhat troubling accepted view that knowledge is a promising source of competitive advantage, but it's promise must be diminished in order to exploit the resource"(Coff, Coff and Eastvold, 2006:452). Other scholars provide evidence that US firms invest abroad so as to acquire new knowledge at a reduced cost, or to decrease R&D costs (Chung and Yeaple, 2008: 1207).

The definition of 'knowledge worker' is contentious. Hislop (2008), based on different dimensions of knowledge, such as creativity, intellective skills (reasoning) and knowledge form (from contextual to theoretical), distinguishes the degree of knowledge use between business consultants and office equipment service engineers. De Guzman (2007) outlines recent trends in the recruitment of professionals knowledgeable in information technology (IT). Since early 2000, firms have generally sought IT specialists that can integrate technology into their firm's business. Those that are more highly prized have knowledge not only of IT but also the specific business (DeGuzman, 2007). Similarly, in an email interview discussing the 'new economy' business model at Thomson Publishing, CEO Tom Harrington describes a new role in the organization, one filled by individuals with knowledge of both IT and business. He also speaks of the paradigm shift from information providers to providers of customer responsive, high-value content in an accessible, functional format (Baseline Mag, 2006). Based on the assumption that 'With the coming of the knowledge economy, knowledge and relationships have become the most essential capital in the business", Liyun, Keyi, Xiaoshu and Fangfang (2008) suggest that,
particularly in service based industry, customer knowledge management is of greater importance than customer relationship management in sustaining competitive advantage. In other words, utilization of the customer's knowledge base to build the product is essential to retaining those and other customers. Another observation of the evolution of ICT and the workforce is that firms rely more heavily on e-learning, or the provision of employee training programs based on ICT (Derouin, Fritzche and Salas, 2005).

More controversy rests in the discomfort of firms with their IT usage. Grant (2007) suggests that there are many companies that have not yet learned how to appropriately value their investments in communication technologies to achieve competitive advantage or to achieve innovation. This lack of quantifiable standards of IT value may in part be due to discomfort with the uncertainty of the effect of employing novel technologies in a rapidly evolving area. Research into the growth and localization of knowledge-based businesses in Switzerland suggests that the transfer of knowledge, particularly tacit knowledge, encourages firms to aggregate into large networks. In other words, the knowledge based economy draws value chain members closer together because knowledge does not travel well over long distances (Thierstein, Luthi, Kruse, Gabi, and Glanzmann, 2008). Peppard (2007) describes the on-going mystic-like quality of IT in firms and supports his contention that knowledge is required to integrate IT functions into the firm in order to derive competitive advantage from them. He states: "The notion of organizational competencies provides a device to focus the integration and coordination of knowledge for particular purposes" (Peppard, 2007: 336). A study of 154 companies and their approaches to the acquisition and utilization of external technology by Lichtenthaler and Ernst (2007) suggests, somewhat surprisingly, that few firms aggressively license technology. The authors consider those that do to be innovators in the next wave of the knowledge economy - those who practice innovation by open, trans-firm processes.

Knowledge management has become a topic under consideration in the management literature. In part, it is the link between human capital and the reduction of knowledge to property and therefore products. "Knowledge management (KM) is typically the approach that is used to guide the management of intellectual capital" (Dalkir, Wiseman, Shulha, and McIntyre, 2007: 1497). Dalkir et al (2007) surveyed the KM literature to identify an appropriate framework for creating a measurement system for a particular organization. Hass and Hanson (2007) studied 182 sales teams to delineate various components of knowledge management and found that some may increase efficiency while others increase effectiveness. Discussing a survey conducted by AMR Research of 350 IT and other executives regarding their allocation of resources to knowledge management infrastructure Murphy (2008) suggested that the biggest gap between perceived importance of the function and performance is in knowledge worker productivity. In other words, knowledge workers do not have the tools to work efficiently. Thus, knowledge management software, particular with a client interface, is increasingly being regarded as a source of competitive advantage. A survey of 500 senior managers in US and UK firms revealed their perception that too much time is spent collecting information or knowledge and not enough in using it to build value for the firm (McKellar, 2007). A measure of the growth of the field of knowledge economy may be research studies which delineate different aspects and advantages of knowledge in business processes. A good example is a study by Schulze and Hoegi (2006) that examined the stages of development of new products and determined where the contribution of knowledge creation was most effective.

The objective of this study is to provide insight into how business practitioners and senior executives from a wide variety of industries and firm sizes, perceive the influence or the effect of features of the knowledge-based economy on their individual enterprises. In other words, ‘What does the knowledge based economy really mean to senior business managers?’ This research seeks to identify the real, tangible and perceived effects of economic focus on intellectual capital. The study recognizes that intellectual property, human capital and knowledge are created, derailed, enhanced or detracted from by
such influences as pervasive electronic communications technologies and aspects of globalization, such as international pools of workers and the de-industrialization of the developed world. Taken together these are considered to be responsible for the accelerated pace and competitiveness of all facets of all businesses. While this statement appears to encompass a broad selection of concepts, it does so purposely. It is the objective of this study to narrow the field of investigation to what is relevant based on the impressions of executives of businesses operating in the current global environment.

Methodology

The dataset used in this study was extracted from the Acadia International Executive Insight Series (AIEIS). “The Acadia Video Interview Database [sic AIEIS] is an interactive database of personal interviews that can be navigated and accessed over the Web. The overall database hosts a series of smaller databases. Customizing the content of each small database by selection of themes allows the databases to meet the needs of various target audience. A typical volume of the database is composed of 10 to 15 video taped interviews of business executives, who address 10 to 20 questions crafted to expose their businesses, industry and professional strategies. A transcription of each question and response accompanies the video clip. The interview series is contained in a web based format, with introductory page, contents page and keyword index. Keywords link to individual questions or individual interviews and are searchable. Users select individual questions from the list to play a segment. None are longer than 5 minutes, adding user friendliness and delivery over the Internet in real time” (Dulhanty & Vibert, 2007). This resource was created at our institution to enhance the learning experience in business school environments with ICT. It also allows studies, such as those described here, of current business practices, influences and practitioner impressions. Permission was granted by the interviewees to use the video-taped interviews and their transcripts for research purposes. This covered the research ethics approval deemed necessary by the Research Advisory Board of the investigators' University.

The AIEIS interviews used here conducted as a variation of the Long Interview, described by McCracken (1988). The questionnaires were developed in advance of the interview and the questions were open-ended so as to “glimpse the categories and logic by which he or she [the interviewee] see the world” (McCracken, 1988), in order to obtain as unbiased impressions from the interviewees as possible. The interviewees were provided with the questions in advance of the interview and the actual interviewer was a passive party, generally a faculty member from Acadia University who only intervened if clarifications of the questions were required. Follow-on questions were held until the end of the interview. This approach to the interviews ensured distance between the researcher and the interviewee, protecting against leading or directing the interview. In addition, the interviews were transcribed by independent research assistants, avoiding premature analysis of the data. The lead researcher in the current study did not see the interviews until after transcription.

The questions asked of the interviewees were crafted to elicit open-ended responses about the role the interviewee played in his or her firm, and to obtain an overview of the firm and its industry. Particular emphasis was placed on emerging external factors and how the business responds to them. The theoretical framework from which the questions were developed was that of prevailing strategic management theory, such as that described in (Dess, Lumpkin and Peridis, 2005) although the researchers feel compelled to disclose a positive bias towards the Resource Based Theory of the Firm (Wernerfelt, 1984), which is not a theory embraced by all in scholars in strategic management (Schneider, 2004).

The quantitative methods described by Glaser and Strauss (1967) and later supported by McCracken (1988) and by Charmaz (2004) were used to analyze the data. An overview of qualitative research methods (Denzin and Lincoln, 2005) supports grounded theory as the most applicable approach.
This method was chosen because the goals of the discovery of grounded theory are closely aligned with the objectives of this study: namely determining perceptions of the impact of the knowledge based economy on business. The goal of grounded theory is to generate or find new theory from a set of solid data. We believe our dataset is a solid set of data due to its scope (numerous industries, company sizes and countries of origin), timeliness (the earliest interviews were conducted in 2004) and breadth (over 3000 question and answer pairs). New theory is derived from the data set as a whole, then illustrated with characteristic examples. This can be contrasted with empirical approaches, which would use the data to support or detract from established theory. We believe the creation of theory is more appropriate in this instance as the impact of the knowledge based economy on business is an emerging field. As Charmaz (2004) suggests, grounded theory bridges interpretive studies with positivist philosophies. Another advantage of discovering grounded theory is that it avoids debate on the definition of terms, as the terms are defined by the data and therefore will emerge with definitions. On the basis of the type of study undertaken, we expected to obtain substantive, or applied theory, rather than formal or conceptual theory.

As described by Glaser and Strauss (1967), the analysis of the data proceeded in an iterative manner. The dataset was created by choosing a subset of responses from the AIEIS. These consisted of responses to explicitly stated questions about the knowledge based economy, and answers that included keywords to the knowledge based economy even though there was no specific reference to it in the question.

In the first round of analysis, interview segments were reviewed sequentially. The answers were coded on the basis of either how the key concepts of the knowledge-based economy were defined, considered to impact the business or are perceived to be evolving over time. These answer categories were developed during the process of data review, rather than prior to its beginning. Themes emerged from this work. In order to more thoroughly characterize these themes a secondary analysis was performed. This coded answers on the basis of tangible categories such as internally or externally derived impact of the knowledge based economy, characteristics of the interviewee. The purpose of this round of analysis was to determine if refinement of any of the themes that emerged in the first round was required. Specifically, questions were addressed such as: was the representation of technology specific to technology or non-technology based companies, was knowledge a noted source of value in one industry over another and was there an area of the business where the perceived impact of knowledge, know-how or technology had a greater impact than others.

To minimize bias from prevailing theories, we purposely avoided an extensive literature review until after our data analysis was complete. This is appropriate for grounded theory approaches. We believe our experimental approach is similar to that of Kezer (2005), Palmer and Marra (2004) and Lindholm (2004).
Results

The keywords used to extract interview segments from the AIEIS were developed by creating a comprehensive list of terms found to be associated with the knowledge-based economy. These were grouped on the basis of common language elements to obtain eight independent terms deemed to cover most references that would emerge in general business conversation. Exhibit 2 summarizes the number of interview segments obtained from searching the interview database. Some interview pairs matched more than one keyword, however, specific note was not taken of this, as it is considered unimportant. A representative interview guide, reflecting a representative set of questions provided to the interviewees can be found in Appendix 1.
Exhibit 2

Keywords Used to Create the Dataset

<table>
<thead>
<tr>
<th>Key Word</th>
<th>Number of Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual Property</td>
<td>6</td>
</tr>
<tr>
<td>Knowledge</td>
<td>89</td>
</tr>
<tr>
<td>Know how</td>
<td>24</td>
</tr>
<tr>
<td>Tacit Knowledge</td>
<td>0</td>
</tr>
<tr>
<td>Technology Transfer</td>
<td>0</td>
</tr>
<tr>
<td>Commercialization</td>
<td>2</td>
</tr>
<tr>
<td>Knowledge transfer</td>
<td>0</td>
</tr>
<tr>
<td>Technology</td>
<td>165</td>
</tr>
</tbody>
</table>

Although not a focus of this investigation, note was taken of the types of questions which elicited responses related to the knowledge-based economy. A broad range of concepts, including very general questions, those related to challenges mediated by external influences, communications, management of human capital and competitive advantages were noted.

As the data was surveyed, several types of observations were made. Each answer was grouped into a category related to the type of information it contained. It should be noted that these categories were not developed until the entire dataset was surveyed. Memo type notes were made during data survey. These memos tended to relate either to the experimental methods. In an effort to capture the general impression derived from the dataset, a set of general observations was recorded immediately following completion of review of the dataset. Based on all of the above observations, categorizations and analysis, five themes emerged from the data. Finally, in order to address the question of how generalizable our emergent themes prove to be, the question and answer pairs were future categorized by four tangible characteristics, namely rank or responsibility of the speaker, industry segment, internality or externality of the influencing factor, and area of the business effected.

Categories were developed for the interview segments. These are (i) Know-how: Specific types and applications of know-how were recognized, which include people management, wine-making, communication, agricultural pests, how to run a restaurant, technology, marketing, specific task performance, to negotiate, global, to lead, to apply knowledge, and to manage unskilled labour. (ii) Knowledge: Types of knowledge identified included business, industry specific, government regulations, ethics, commercial, sales, marketing, company-specific, product, of assets, international, cultural, redundant knowledge (for backup), and of client needs. (iii) Value of knowledge. (iv) Accessory knowledge. This is a term we believe we have coined which we have defined as knowledge that is not necessarily a job specification but is valuable for performing the job. Another set of categories were related to characteristics of technology: Technology was characterized as a threat (v), as a valuable resource (vi) and as a difficult to manage entity (vii). There was also distinction made as to the part of the business impacted by technology (viii). The final category (ix) was paradigm shifts or references to dramatically different ways of doing business.

In addition to going through data to identify categories, observations were recorded as memos, distinguishable from the categories in that memos were interpretations of the data, suggestions of trends
in the data and other analytical outcomes, whereas an effort was made to extract information directly from the data for categorization. The substance of many of the memos is found in the discussion section below.

Based on the foregoing categorization, general observations from reviewing the data, and suggested trends, the following themes emerged:

1. Knowledge is a source of competitive advantages, particularly accessory knowledge.
2. Know how is a traditional business concept and commodity.
3. Technology, in all its embodiments, poses on-going challenges.
4. Technology is not sufficient to base a business on.
5. The impact of the knowledge based economy is less in massive paradigm shifts and more in incremental changes to business.

The first four themes are illustrated with specific passages from interview segments, listed below:

**Theme 1 and 2:**

- **Specific types of knowledge**
  - '…subject matter experts. Those are the key suppliers of information and ideas and expertise in various areas…'
  - 'one-on-one knowledge of understanding where they're coming from…'
- **Value of knowledge**
  - '…if you have a solid intellectual property, it is a foundation to protect your business long term'
  - 'the requirements to be successful…ideally some kind of proprietary intellectual property that will differentiate it.'
  - 'Knowledge is always power.'
  - 'The wealth of knowledge is concentrated in very few people.'
  - '…we also need to have a specialized knowledge or expertise that perhaps goes beyond what our competitors are able to offer.'
- **Accessory knowledge**
  - '…you have to know about the management of the business as well you have to have a knowledge of wine making.'
  - [of accountants] 'They have knowledge of the industry or sector that they bring to the client.'
  - 'get your basics in order but think about the soft skills…' [of market researchers]
  - '…knowledge about the whole beverage industry through rules and regulations and consumer trends on the other hand the financing part.'
  - 'There's a tendency to think that if you know how to grow grapes and make wine, then you've got what it takes to be a successful winemaker.'

**Themes 3 and 4:**

- **Technology as a threat**
  - 'On the other hand, it's [the Internet] taken away the competitive advantage of having the information…. Some people worry about the Internet.'
  - 'It's [the Internet] affected it [their business] hugely. It's just unbelievable in terms of the impact that it has had on our business and I think anyone who doesn't get that is going to die.'
'Rapid change in technology that even we, and I think we're good at it, have our hands full keeping up with.'

You have to be able to respond quickly. Very, very quickly. And it surprises me what is asked of us in terms of some of the things we have to do that is predicated on some of the technology that is available.'

Technology as a mystical, difficult to manage entity

'If you're a young person now graduating from University you've opportunities to go and add value ... even in some traditional industries.'

'...the younger generation who are advanced in technology and keeping them interested in staying with the organization...key issue...

'...knowledge changes so quickly... pace at which knowledge changes...'

'...in a world where new technologies come to market in 90-day cycles.'

'In a world of high tech, and high paced decisions, things change very rapidly. You need to change prices on an hourly basis.'

'...blind spot is in regards to where the technology is going. Every year that goes by there are changes in the types of on-line information.'

'Technology is constantly changing and we don't know what's around the corner...You have to be ready because if you don't provide it then someone else will.'

'...we must always and constantly be looking abroad for new technology.'

'...we had an instance of a router that was causing havoc...'

'I do think that there are blind spots in the particularly in the technology end of things.'

'...highest technology...'

'...technology moves so quickly...'

Value of technology

'So, I had all this R&D and technical capabilities. My goal was, "how do I maximize it, to get a better return on investment?"'

'...we differentiate ourselves because we're good below the ground technical people...'

'...having the technical staff gives our non-technical people an advantage vs. other investment banks.'

'...people buy our product because the technology is very high quality.'

'Our strength is in our people and in technology.'

The fifth theme, regarding a lack of massive paradigm shift, was contradicted by some interviewees, as documented in selected quotes below. However, the overall impression from the dataset was that most businesses continued to operate with incremental changes, rather than dramatic changes and that the paradigm shifts alluded to below were more reflective of the pace of life, rather than the factors of production that underlie the economy.

Paradigm shifts

'Our business is changing, in fact it has changed, but it is changing dramatically.'

'In today's world, where there are so many complexities and challenges the ability of one individual to be all knowing and being able to make all the decisions I think is a throw back to yesterday.'

'...in terms of getting information I think that that's changing quite dramatically today...'

'Technology has, in my mind, officially wrestled who is in control.'

'...professionals everywhere... find themselves no longer competing in a local jurisdiction. You are competing nationally, regionally or even internationally.'

'Technology has taken over too much.'

The emergent themes from our analysis of all of the interview segments suggested several lines of further inquiry with the same datasets. We wanted to address whether the perception of technological
impact or knowledge impact differed based on certain tangible characteristics of the interviewees or their businesses. Therefore, the interview segments were coded on four additional parameters: speaker title or position in company, industry segment, perceived internal or external source of knowledge-based influence on business and the area of the business impacted. The final category was divided into four choices: (a) infrastructure or systems that would support many aspects of the business, such as email or videoconferencing, (b) operations or parts of the business involved in the production of the firm's goods or services such as computer controlled fermentation vessels, (c) products that were made possible or modified by changes in knowledge or (d) strategic value of knowledge or technology to the company or instances where knowledge or technology contributed to competitive advantage.

The categorization based on the title or position held by the speakers did not yield useful information. All of the interviewees fell into three categories: business owner, CEO or equivalent, or senior VP. It was decided that there was insufficient information about distinctions in the roles played by each interviewee in his or her business to extract information relating the role to the speaker's perception of the impact of the knowledge-based economy to his or her business.

It was found that 60% of the interviewees discussed the knowledge-based economy with the perspective that it was a factor that impacted their business internally. For example, interviewees commented on the use of communication technologies, changes in manufacturing technologies and personal training. Alternatively, 40% of interviewees alluded to influences of knowledge related factors as an external force on their businesses, such as technology was something to be 'keep up with' or 'watched' or that gave their competitors an advantage or forced change in their business.

Once categorization of the industry segment was completed, it was clear that there were three main categories relevant to the current study. These are: communications-based businesses such as market research, technology-based businesses with products or services created with emergent technology and others, which consisted of many individual businesses in a wide range of areas, such as tourism, or farming. The incidence of the various answer categories, and perceived area of the business impacted were compiled for these three industry categories. Exhibit 3 contains the result of this compilation.
Exhibit 3

Observations of Frequency of Answer Categories and Area of the Business Impacted by Industry Sector

<table>
<thead>
<tr>
<th>Answer Category</th>
<th>Technology Based Industries</th>
<th>Information Based Industries</th>
<th>All Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessory Knowledge</td>
<td>8%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Technology Mystic</td>
<td>36%</td>
<td>30%</td>
<td>24%</td>
</tr>
<tr>
<td>Technology Threat</td>
<td>14%</td>
<td>17%</td>
<td>14%</td>
</tr>
<tr>
<td>Value of Knowledge</td>
<td>3%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>Value of Technology</td>
<td>39%</td>
<td>15%</td>
<td>24%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area of Business Impact</th>
<th>Technology Based Industries</th>
<th>Information Based Industries</th>
<th>All Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>16%</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td>Operations</td>
<td>34%</td>
<td>26%</td>
<td>30%</td>
</tr>
<tr>
<td>Product</td>
<td>27%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>Strategic Value</td>
<td>23%</td>
<td>44%</td>
<td>37%</td>
</tr>
</tbody>
</table>

The above analysis relates the frequency of observation of the interviewee’s impressions of the impacts of the knowledge-based economy to the industry sector of the interviewee. From this analysis, several trends are notable and may be worthy of further investigation.

One of the themes that emerged from this study was that technology is regarded as a mystical, uncontrollable, unfathomable entity by many. Significantly, this sort of reference was not more or less frequently found in speakers from technology based businesses (36%) than knowledge-based businesses (30%). This is surprising, as those in technology based industries might be expected to be more comfortable and familiar with technology. The differences observed in the frequency of emerging themes, such as more frequent reference to the value of technology in technology-based business and more frequent reference to the value of knowledge in information-based business is expected, as it is merely reflecting value in the resources necessary to build the business. This can be contrasted to the observed incidences of the area of the business where the impact of the knowledge-based economy is discussed. The most notable difference from the overall observed frequency is in the strategic value category. In interviewees from technology based businesses, a lower incidence (23%) of reference to the strategic value of the knowledge or technology was found than in other industries. This may be a reflection of what one speaker makes explicit: "proprietary technology in and of itself does not make a product or a business".
Based on this analysis, we modify our third emergent theme to 'Technology, in all its embodiments, poses on-going challenges to most businesses, including those that are technology based.'

**Discussion**

Analysis of a unique resource, consisting of semi-structured interviews of a wide range of executives on their perceptions of the knowledge-based economy, resulted in the emergence of five themes:
1. Knowledge is a source of competitive advantages, particularly accessory knowledge.
2. Know how is a traditional business concept and commodity.
3. Technology, in all its embodiments, poses on-going challenges to most businesses, including those that are technology based.
4. Technology is not sufficient to base a business on.
5. The impact of the knowledge based economy is less in massive paradigm shifts and more in incremental changes to business.

Despite extensive use in the media and the academic literature, we discover that practitioners do not normally use the phrase *knowledge-based economy*. To the majority of respondents, the knowledge based economy is about things distinct from utilizing discovery and innovation to radically change our world including the economy. The only interviewees who spoke in such terms about technology development were those in the business of facilitating such activities. To most practitioners, the knowledge-based economy relates to localized individual impacts on specific parts of their business; it is only high level policy developers who think in the mode of paradigm change. Practitioners recognize its presence and can relate to some of the attributes of the presumed knowledge based economy, such as trends towards selling or using knowledge as a competitive advantage. (Theme 5)

Similarly, there is little reference to *intellectual property* per se in the interviews studied here. Is this an artifact of terminology or of focus? If focus, does it call into question the resource based view of the firm? “The firm must be concerned not only with profitability in the present and growth in the medium term but also with its future position and source of competitive advantage. Firms must think about how they will compete when their current strategies are copied or made obsolete...Competitive advantage can be sustained only if capabilities creating the advantage are supported by resources that are not easily duplicated by competitors” (Hart 1995, 998). A few of the interviewees recognized the value in intellectual property, but many more recognize the value in intellectual capital. The value of knowledge was well appreciated in our study group. Two aspects of this were apparent in our results. Knowledge required to perform a particular task or create a product was valued. However, the concept of accessory knowledge, referred to, but not named, by DeGuzman (2007) and Harrington (2006), was a common thread in many of the interviewee's views of knowledge workers and accorded significant value. (Theme 1) An interesting dichotomy, expressed by one interviewee, was that knowledge could be possessed by those without a significant amount of capital investment, although presumably exploiting the knowledge would require capital input.

Know how, which is easily equated with tacit knowledge, was a surprisingly well understood and appreciated concept in the interview segments we studied. It was generally referred to in a specific context, related to achieving a specific part of the business process, compared to knowledge, which was considered a more general attribute. (Theme 2) In this respect, know how does not appear to be an exclusive domain of the knowledge based industry, although tacit knowledge is frequently referred to and discussed, particularly in the context of knowledge management approaches, in the management literature. An interesting exception to this observation is the reference made by several interviewees regarding the value young employees offer to the firm as a result of their inherent understanding of technology. This leads to concerns about retaining such valuable assets. These allusions by the
interviewees are consistent with characteristics cited by Drucker (1989) and others (see Introduction) of knowledge workers. These new characteristics of knowledge based workers is sometimes referred to as a paradigm shift, wherein younger, less experienced workers are valued more highly than seasoned employees. However, the emphasis and appreciation for know how that we found in our study does not support this as a paradigm shift.

Perhaps the most surprising finding in this study related to the prevalent view that technology is a fearsome, uncontrollable creature, capable of great destruction without notice. Technology maintains a mystic that it is almost self-possessed. It can't be depended on to work, only young people truly understand it. Its longevity is a mystery. To take this concept a little further, when interviewees were questioned about outsourcing, often IT was mentioned. The implication is that IT, or the management of technology, is something someone else can do better. (Theme 3) This dramatic characterization of technology lead us to further investigate the nature of the businesses from which executives can who spoke of technology with fear. It might be expected that those in technology based business would have a more balanced view of technology, but we did not find this. Perhaps for different reasons, technology is perceived to be every bit as much of a threat to executives in 'high tech' business as others. This may be a reflection of the on-going difficulty cited by Grant that firms have in valuing their IT expenditures.

At the same time that technology is an unwieldy, formidable force, harnessing the power of the beast is not sufficient to build a business on. Technology doesn't stand alone. It's not a product. It's not a full service. It's not total communication. It's not total marketing. (Theme 4) The concept of technology in and of itself is interesting. It is sometimes referred to a single entity, even though we all understand that there are various types of technology, such as general (e.g. internet) applicable to all businesses, specific to industries (e.g. oil extraction methods) and general technologies more applicable to some than others (internet for airlines).

Not surprisingly, finding and implementing the right technologies continue to challenge organizations but mastering these same technologies does not in itself ensure success. Knowledge can be a source of competitive advantage but it is also a commodity. For individuals, the differentiating type of knowledge is accessory knowledge or know-how that is in addition to that of one’s profession.

Conclusions

A number of findings characterize the results of this study. Five major themes associated with managerial perceptions emerged. Technology was found to pose on-going challenges in most businesses and but possessing the technology or its right of use does not represent the basis for a successful business. Knowledge, especially accessory knowledge, as a source of competitive advantage is valuable. Business know-how is a traditional and well accepted concept as well as a commodity. Finally, the effect of the knowledge-based economy can be found less in stimulating a massive paradigm shift than in facilitating incremental changes to business practices.

The study suggests two important implications for managers and theorists alike. First, there is still value to be added in the building of core competencies among managers in the comfortable use of communication technologies. Our review of the recent literature suggests this might be in knowledge management. Second, there is extensive recognition of the value of accessory knowledge or practitioner insight that is separate from the professional knowledge bestowed by formal training possessed by that practitioner.

Despite these important implications the study does have shortcomings. The data consisted solely of the reflections of the interviewees. As pointed out by Esterberg “in-depth interviews can provide insight into
people’s thoughts and feelings, but people’s behaviors don’t always match their words.” (Esterburg, 2002: 36). In other words, the interviewees were expressing their opinions not necessarily reflecting the outcome of an investigative exercise. The interviewees in this study were all executives from viable businesses. Therefore, the perspective of the effects of the knowledge-based economy would be that from within the business and not that of general employees, customers, shareholder or the broader community. In addition, the study is not informative about businesses that have failed as a result of the knowledge-based economy. There was only one source of data and it was not designed for the purpose of learning about the impact of the knowledge based economy. However, we also view this as an asset, providing distance and spontaneity to the responses.

Future work

The type of knowledge obtained from this study is likely to be directly applicable to strategizing in firms faced with current, global circumstances. Future research may focus on accessing and categorizing insight according to industry, location, or occupation. Data collection could be broadened to take into account views of customer, shareholders and employees. The video database may be used to undertake research focused on other important managerial concepts. One general impression, outside the scope of this work but worthy of further study, from a wide range of interview segments, is reference to lack of time, doing everything in a rush, being frantic and particularly rushing to keep up with technology. Additional studies may be warranted on the general attitude reflected by many interviewees describing technology as omnipotent and possessed of magical powers that it can bestow on the holder. A recent survey related to the informal and web2.0 learning practices, in which 235 respondents from firms of all sizes and industries, indicated that 75% of respondents feared their employees and businesses were not adequately preparing themselves for the future (Cross, 2008).
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Appendix 1

Acadia University
Fred C. Manning School of Business

Acadia International Executive Interview Series

General
1. Can you share some descriptive details about your company? HISTORY
2. How would you describe the culture of your company? CULTURE
3. How would you describe your leadership style? LEADERSHIP
4. Can you describe a typical workday for yourself? WORKDAY
5. Can you describe your role in the company? ROLE

Competitive Features
6. What is your company’s basic business model? BUSINESS MODEL
7. What are the major trends currently affecting your industry? TRENDS
8. What are the most significant uncertainties facing your industry? UNCERTAINTIES
9. What common characteristics do successful firms in your industry share? SUCCESS FACTORS
10. What factors do struggling firms in your industry share? FAILURE FACTORS
11. Can you describe the value chain of activities in your industry? VALUE CHAIN
12. Are there any areas of the industry value chain that are currently facing unique challenges? VALUE CHAIN
13. What is the next frontier for your industry? What are the key drivers that must be successfully managed to benefit from this frontier? FUTURE
14. In your opinion, is there a skill shortage in your industry and if so which skills are in particularly high demand? SKILL SHORTAGE
15. What actions might be taken to alleviate this skill shortage? SKILL SHORTAGE

CSR, Governance and Ethics
16. What actions is your company taking to behave in an environmentally sustainable manner? ENVIRONMENTAL SUSTAINABILITY
17. What are the greatest challenges or barriers faced by your company in its efforts to act in an environmentally sustainable manner? ENVIRONMENTAL CHALLENGES
18. How does your company ensure employee health and safety? Can you provide a few specific examples of how you manage this important issue? HEALTH & SAFETY
19. How does your company seek to ensure employees adopt a proper ethical framework for decision-making? ETHICAL DECISION MAKING

Careers
20. Why might a new graduate have an interest in pursuing employment with your company? CAREER