

Value-Drivers and Strategic Management in the Knowledge Economy

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Abstract

This paper provides a precursor to a more profound understanding of the value management process in the knowledge economy. The prominent value-drivers in three intellectual capital-intensive sectors in Australia are identified, specified and extrapolated to provide implications for the strategic management of value in a knowledge-based firm. The perceived value-drivers are identified from case studies consisting of firms in the biotechnology, information technology and energy and environment protection sectors. The value-drivers that pervade the equity capital of knowledge-based firms are identified, analysed and the management implications for strategic value management are discussed and explained.

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1. Introduction

The primary objective of management in maximizing shareholders' value is straightforward and generally involves generating consistently high returns with regular growth. In the modern evolving economic environment where knowledge is regarded as a key organisational asset, one that firms can generate and exploit in the creation and sustenance of wealth, a shift is appearing on how the valuation game is played out. The process of valuation refers to activities such as techniques, procedures and statistical tools that are employed by management and market analyst to ascertain and determine the economic value of an asset. Valuation is central to the financial management function of a business, which encompasses the daily administrative financial and strategic capital budgeting decision-making processes. While this has always been regarded as a difficult area of decision-making, the emergence of the knowledge economy has presented firms with a different and even more onerous environment for valuation of intellectual capital. Therefore, in order to manage performance, management must possess the ability to understand the underlying value of knowledge to efficiently and effectively make continuous investments in intellectual capital. In today's competitive global environment the growing application of knowledge provides a substantial source of competitive advantage and enables firms to benefit increasing returns (Arthur 1996) from investments. The concepts of management in the knowledge economy include the ability to understand and appreciate the value of a firm's bank of intellectual capital, and manage the critical factors that affect value. The motivation of this paper is the need for identification, from a theoretical and strategic perspective, the value-drivers that are important to the management of intellectual capital.

The emergence of the knowledge economy has generated a heightened interest in the principles, methods, and issues connected with the valuation of intellectual capital assets (Smith and Parr 2000, Bontis 1996). The application of currently available valuation to measure intellectual capital, including the most commonly used model the discounted cash flow technique, has revealed serious limitations (Drucker 1993, Dabek 1999, Razgaitis 1999).

These limitations make it imperative to develop new and more appropriate models for valuing intellectual assets. Three industries are selected with the primary aim of identifying ‘value drivers’, i.e. underlying characteristics that create value in intellectual assets as a precursor to understanding how they should be managed. This approach has gained increasing recognition in recent years as a major development in valuation methodologies, and is based on the hypothesis that there are key elements that stand out as significant in the creation of value of knowledge assets (Helfert 2000).

2. Research Methodology

This paper presents the preliminary results of an exploratory research aimed at identifying, evaluating and specifying the key factors that drive the value chain of intellectual assets. The steps involved in the research process are as follows:

- Identify, evaluate and specify the value drivers in each of the selected industries;
- Test the pervasiveness of these factors pertaining to the valuation of intellectual assets across the industries, and
- Extrapolate their significance in the strategic management process.

The research approach adopted in this study is based upon the case study methodology. The primary source of information on the value drivers have been derived from current literature, and case studies drawn from companies in each of the three selected industries based on their suitability both to the purpose of the investigation and to the nature of the data to be collected and analysed (Yin 1993). The industries comprise the biotechnology, information technology, and the energy & environment (E&E). The reason for the choice of these industries is that they represent key sectors in the knowledge economy, and for the potential they offer for growth and profitability. The analysis of the data from the case studies is carried out using Microsoft EXCEL and the NVIVO case analysis software, which uses its pattern matching logic as the fundamental mode of analysis to establish the key value-drivers in each of the three industries. Linking data to propositions can be done in a number of ways, but since the case study analytical software NVIVO will be used, this will be achieved by ‘pattern matching’, which is regarded as one of the best approaches (Campbell 1975).

The pattern matching technique is a good way of relating the data to the propositions, particularly where the multiple case study strategy is used.

The limitations at this stage of the research are that the results are derived from a small sample and this could create a bias in the findings. However, the next stage research will involve a bigger sample size using a questionnaire survey to verify the initial findings and reinforce the hypotheses.

3. Results and Implications for Management

The results from the case study analysis have been tabulated in Table 1 and Table 2 below. In Table 1, the key value-drivers are ranked in order of frequency of observations and Table 2 shows the importance placed on the value-driver by each industry. The implications of these findings for management are also discussed.

Value-Driver	Biotech	Infotech	E&E	Total	Ranking
Profitability	16	7	12	35	1
Uniqueness of innovation	11	9	14	34	2
Reputation of research team & firm	6	11	8	25	3
Growth prospects	16	4	4	24	4
Quality of management	11	8	4	23	5
Economic factors	6	7	2	15	6
Risks	6	6	2	14	7
Patent protection	7	3	1	11	8
Productivity	6	4	1	11	8
Governmental support	0	0	10	10	9
Cost effectiveness	0	1	3	4	10

Table 1 Comparison of Value-Drivers in Different Sectors

Only the first four highest ranked value-drivers are discussed in detail in this analysis. Day (1999) states that profitability, a major objective of any business, is the reward for making investments in the past, which is also a strategic step in establishing a firm's competitive position, and intended market share. The value-driver "Profitability" has the highest observations (i.e. a total of 35 observations across all sectors) indicating the underlying

importance of commercial viability of a knowledge-venture in wealth creation. This perception of profitability as a key value-driver is consistent with the belief that investments in knowledge assets are no different to tangible assets in their role as a vehicle of wealth creation. The objective of achieving profitability is a reflection of the awareness of managers to make commercially viable investments (Anthony 1995, Day 1999). Further, intellectual capital arising out of a firm's innovation extends its technological capabilities, and contribute to the wealth of the firm and society Narayanan (2001).

The value driver 'Uniqueness of an Innovation' scores the next highest number of observations. This value-driver implies a firm's creativity, and has a major role to play in the creation of products that are genuinely unique as distinct from those that are merely extensions or improvements Kuratko (1998). Most innovations result from a conscious, purposeful search for new opportunities (Josty 1990). Intellectual assets are a reflection of intellectual capital, which are products of innovative thinking, new methods or new knowledge (Drucker 1985). Further, there is a strong perception that firms in the knowledge economy succeed because they are able to develop range of unique products and services (Karakaya 1994).

The next highest ranked driver is 'Reputation of Research Team and Firm' and this high ranking is consistent with the findings of Darby et al. (1999). They hypothesised that high-tech ventures with strong link to "star scientists" should be more highly valued by investors and examined the effects of ties to star scientists on the market value for new biotechnology firms. In their conclusions they stated that an increase in a firm's intellectual capital would lead to higher market valuation.

'Growth Prospects' arising out of commercialising the products of intellectual capital is observed to be the fourth most important value-driver. Growth is derived from a firm's

market share, competitive positioning and profitability (Day 1999). Thus business managers are keenly aware of the need to make the necessary investments to maintain and increase their market share (Kotler 2001). For this reason, firms invest in assets that yield long term value creation by giving them a strong market position based on superior customer value, or the lowest delivered cost (Narayanan 2000; Westland 2002), which in turn, give them the competitive advantages of growth in market share and profitability, both of which are strongly related (Day 1999).

The other important value drivers (in descending order) are 'Quality of Management' – where successful management involves not merely discovering new solutions or adopting seemingly effective innovations, but also finding a home for the discovered products and services in the marketplace (Day 1999) and the costs and risks inherent in developing intellectual assets must be issues of careful management consideration (Weil 1983; Contractor et al. 1988); Quality of management is inherent in human capital, such as key scientists employed in high-tech firms, which have a strategic advantage in exploiting the commercialisation of the discoveries. 'Economic Factors' – involves a close management evaluation of the market conditions to manage performance; "Risk" - in driving value is derived from the extensive work in portfolio theory and capital market theory by Markowitz (1952) and Sharpe (1964) in that management incorporate risk considerations in making financial decisions; 'Patent Protection' - reflects the legal environment in regard to the protection of intellectual assets and patents not only protect a firm's investments in intellectual assets, but also provide a basis of valuation (Leuhrmann 1997); "Productivity" - as a value driver defines the productivity benefits that the end-user would derive from using the technology developed by the knowledge firm; "Governmental Support" - as a value driver scores very low overall, with the biotechnology and infotech sectors regarding it as of zero importance (Table 2). A plausible explanation is most firms in these sectors already experience R&D and infrastructure support from operating in an established environment (i.e. technology parks); "Cost Effectiveness" - refers to the cost effectiveness of the R&D activity conducted in knowledge-firms. It has the lowest ranking in

the evaluation. But expenditures on R&D are business costs, and like any other costs and expenses, they have to be effective, that is, they must yield profitable results (Narayanan 2001) and are subject to the same budgetary rigours similar to other classes of expenditures (Kuratko 1998).

Value-Driver	Biotech	%	Infotech	%	E&E	%
Profitability	16	19%	7	12%	12	20%
Uniqueness of innovation	11	13%	9	15%	14	23%
Reputation of research team & firm	6	7%	11	18%	8	13%
Growth prospects	16	19%	4	7%	4	7%
Quality of management	11	13%	8	13%	4	7%
Economic factors	6	7%	7	12%	2	3%
Risks	6	7%	6	10%	2	3%
Patent protection	7	8%	3	5%	1	2%
Productivity	6	7%	4	7%	1	2%
Governmental support	0	0%	0	0%	10	16%
Cost effectiveness	0	0%	1	2%	3	5%
Total	85	100%	60	100%	61	100%

Table 2 Importance of Value-Drivers by Industry

From Table 2, the profitability factor among the three sectors features less prominently in the informational technology sector (12%) compared to the other two (19% & 20% for biotech and E&E, respectively). One likely explanation for this may be the capital market conditions affecting the infotech sector. Generally, the top four ranked value-drivers account for over 50% of the total observations in each sector and this imply that all the sectors regard these factors as critical value drivers that management would have to focus on to maintain and create value for their firm.

4. Correlation of Value-Drivers Between Industries

From Table 3 below, the level of correlation of value-drivers between industries seems to be higher for biotechnology and infotech, than for biotechnology and E&E and infotech and E&E.

	Biotech	Infotech	E&E
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Biotech	1		
Infotech	0.4843	1	
E&E	0.2697	0.3125	1

Table 3 Correlation of Value-Drivers Between Sectors

It can be concluded from this observation that there is a greater degree of cross-over in value management between the biotech and infotech sectors. This can imply a greater degree of similarity in market conditions the two sectors have to confront. These market conditions may pertain to competition, technology, capital risk and return, regulatory frameworks, customer behaviour and so on. The cross-sectional differences can be attributed to varying economic fundamentals that need to be incorporated in industry-specific valuation models.

5. Implications and Conclusion

The implications from the research findings from a strategic management perspective would be to practise prudence in monitoring and evaluating the changes to these pervasive value-drivers in strategic decision-making. There appears to be a distinct agreement among all three sectors on the pervasiveness of the top four value-drivers, being profitability, uniqueness of innovation, reputation of research team & firm and growth prospects. This does not undermine the significance and quality of the other value drivers but does highlight where management should focus more resources. It is conceivable that value drivers will change over time due to changes in market conditions.

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