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A Taxonomy of Intellectual Capital and a Methodology for Auditing It

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Abstract

Ownership of intellectual property is rarely measured. While many companies spend huge amounts of money filing and protecting patents, too often that activity is defensive. Patents are not exercised and do not generate wealth for the inventor. Their windows of opportunity remain a mystery to their owners, as does their value. Organisations that are unaware of the value of their intellectual property are missing an important asset that ought to be included in any exercise which aims to measure the value of the organisation.

Other intangible assets such as know-how, customer relations, networking infrastructure, business processes and so on, which also add value to the organisation, are neither measured nor their growth monitored and nurtured as part of a corporate growth strategy. These elements are collectively referred to as Intellectual Capital (IC).

Organisations that would agree that the above mentioned intangibles are valuable, are unable to record, measure and audit their IC, due to the absence of a taxonomy for Intellectual Capital and metrics with which to measure it. This paper discusses these issues and proposes a Taxonomy of Intellectual Capital together with a methodology for identifying and valuing it. It discusses mechanisms and tools for locating and identifying IC within the organisation, together with a means for designing and maintaining the IC Knowledge Base. Finally the relationship between corporate goals, Intellectual Capital and the ability of the organisation to succeed is discussed.

Introduction

It seems that every month a new management technique emerges which CEOs, hungry for new ways to improve the performance of their business, readily devour. Companies are right sizing, downsizing, and reengineering. They are promoting a culture of leaders and followers. They are striving to be learning organisations and to promote team building and self empowerment. The options are overwhelming. But all these techniques have one thing in common: they are seeking to discover better ways of utilising organisational resources.

Organisational resources can be split into two categories: tangible and intangible. Tangible resources are those typically found on the balance sheet of a company: cash, buildings, machinery and so forth. The other category comprises intangible assets: people and their expertise, business processes, intellectual property and market assets such as customer loyalty, repeat business and so forth. Collectively these intangible assets are referred to as Intellectual Capital. In our society more and more businesses are evolving whose value is not based on their tangible assets but on their intangible ones. Examples include the service sector and any enterprise where business relies on people, such as software development.

However, although intangible assets may represent competitive advantage, organisations do not understand their nature and value. They do not know the value of their own Intellectual Capital. They do not know if they have the people, resources or business processes in place to make a success of a new strategy. They do not understand what know-how, management potential or creativity they have access to with their employees.. Because they are devoid of such information, they are downsizing and reengineering in a vacuum. They do not know if they are laying off expertise they will have to rehire next month.

That organisations are operating in a vacuum is not surprising, as they do not have any methods or tools to use, which would enable them to analyse their Intellectual Capital and organise themselves to use it appropriately.

To that end, a methodology and valuation system is required which will enable managers to identify, document and value their IC. This will enable them to make information-rich decisions when they are planning to downsize, reengineer, plan their R&D or invest in the protection of various intellectual properties.

Once identified, the Intellectual Capital of the organisation needs to be documented, stored and kept up-to-date. This IC Repository will become in itself a valuable asset. Its impact on the organisation will be as profound as the database was when it was first introduced. In the future we anticipate being able to buy a body of corporate knowledge, by way of acquiring its IC Repository.

Tangible versus Intangible Assets

Companies are typically well versed in assessing and valuing tangible assets, such as buildings, machinery, cash and so forth, but such measures do not include the value of the work force, their knowledge, the way they use computer systems and so on. In an information society, such intangible assets may represent significant competitive advantage. In service-oriented companies there may be few tangible assets, yet the organisation may be extremely valuable.

In a recent survey of 226 FT 500 (Financial Times) companies, undertaken by The Technology Broker, 76% had not assigned any value in their annual report to intangible assets. Where intangible assets were included on the balance sheet, it mostly referred to goodwill.

We have identified four categories of intangible assets which comprise the components of Intellectual Capital: Human-Centred Assets, Intellectual Property Assets, Infrastructure Assets and Market Assets.

The Components of Intellectual Capital

Human-Centred Assets

Human-Centred Assets comprise the collective expertise, creative capability, leadership, entrepreneurial and managerial skills embodied by the employees of the organisation. It will also include psychometric data and indicators on how individuals may perform in given situations such as high stress. We promote a viewpoint that we are not only looking at an individual in order to perform a particular job function, but view the individual as a dynamic entity who may fit into a variety of jobs over time. It is the job of a good manager to ensure that each human "asset" has access and opportunity to mechanisms which enable the employee to achieve his potential within the organisation. Below is a table of categories we have used as the basis for our taxonomy, together with mechanisms by which categories can be documented. It is important to note that all employees are given the same psychometric tests, as we are not seeking to limit the individual to their job function, but to document the potential of the individual to perform a variety of functions within the organisation. The matching of the individual to a particular opportunity is determined through a comparison of perceived job skill requirements and interpretation of those skills from that aspect. Thus the aspect becomes the question - or viewpoint from which the individual is calibrated. Aspects from which the individual may be viewed include: job potential, training programme, criticality to the organisation, risk to the organisation and so on. An individual has numerous aspects from which he can be viewed. This method better reflects the richness of the individual and his potential within the organisation, as opposed to a simple 'best fit for the job' approach.

The review process is three-way and includes peer-to-peer review, manager and reportee review. It is also designed to be open between the individual and his manager, as the method encourages empowerment of the individual and the enhancement of his knowledge of the organisation's goals. Therefore, it also helps managers to identify where and how a particular employee can best contribute to the successful attainment of those goals.

Category	**Mechanism**	**Aspects**
Education	Reported	Job Potential, Training Programmes, Criticality, Risk
Secondary		
Tertiary		
Masters		
Doctoral		
Post Doctoral		
Skills		
NVQ Level	Assessment	
Skill-1	Assessment	
Skill-n	Assessment	
Job Related Expertise		
JRE-1	Elicitation	
JRE-n	Elicitation	
Personal Attributes	Psychometrics	NeoPI Extroversion, Agreeability, Conscientious, Neuroticism, Openness Briggs Myers, Character & Temperament, OPQ, Leaders, Subordinates
Job Related Attributes	Analysis	Subset from above list
Reviews		
Peer Reporting		
Manager Reporting		
Reportee Reporting		

Template for Taxonomy of Human Centred Assets

Intellectual Property Assets

Intellectual Property (IP) Assets include know-how, copyright, patent, semiconductor topography rights, and various design rights. They also include Trade and Service Marks. Undertaking an IP audit is not a new idea. However many organisations have told us that the results of an IP audit are not particularly useful. After all, knowing that you own a patent is not a lot of use if that fact is not accompanied with information concerning its potential. This is evaluated from the various aspects that the patent can be viewed from including: return on investment, commercial potential, competitive advantage and so on. It is important to note that Intellectual Property Assets are usually considered from their legal perspective, which should mirror that raison d'être. A patent for its own sake has no point or value.

Category	Mechanism	Aspects
Patent Evaluation	Return on Investment	commercial potential, competitive advantage
Copyright		
Trade Mark		
Design Right		
Service Marks		
etc.		

Template for Taxonomy of Intellectual Property Assets

Infrastructure Assets

Infrastructure assets are those technologies, methodologies and processes which enable the organisation to function. Examples include methodologies for assessing risk, methods of managing a sales force, databases of information on the market or customers, communication systems such as e-mail and teleconferencing systems. Basically the elements which make up the way the organisation works. Such elements are peculiar to each business, and their value to the organisation can only be attained by survey within the target organisation. Sadly the acquisition of infrastructure assets is frequently as a result of some crisis, positioning them as a necessary evil rather than assets which emhance the value of an organization. Marketing the value of infrastructure assets to the individual within the organisation is also important, in order to share with him/her the aspects where infrastructure protects, enhances and organises organisational resources.

Category	Mechanism	Aspects
Information Systems	Survey .	
Management Infrastructure		ability to achieve goals, risk..
Financial Management Methods		
Corporate Culture		
Forecasting Methods		
Risk Analysis		

Template for Taxonomy of Infrastructure Assets

Market Assets

Markets assets define the potential an organisation acquires from market-related intangibles. Examples include repeat business percentage, value associated with goodwill such as branding, market dominance due to the market strategy, including positioning strategies which have commercial value, and so on. The aspects these assets are viewed from can vary depending upon the goals of both the marketing function and the organisation.

Category	Mechanism	Aspects
Name Recognition	Survey Positioning	validate market strategy,
growth...		
Repeat Business		
Branding		
Customer Relations		
Investor Relations		

Template for Taxonomy of Market Assets

Together these assets make up the Intellectual Capital of an organisation. These highly dynamic assets are just as important to the organisation as its tangible assets, and indeed, should be considered together with them as the assets which truly make up the organisation and its potential.

Using Knowledge about Intellectual Capital

Knowledge of Intellectual Capital is a rich source of information about the organisation, and is of particular value in the following scenarios.

1. Validating the Organisation's Ability to Achieve its Goals.
2. Planning Research and Development.
3. Information for Re-engineering and Downsizing Programmes.
4. Rationale for Organisational Education and Training Programmes.
5. Assessing the Value of the Enterprise.
6. Growing an Organisational Memory.

1. Validating the Organisation's Ability to Achieve its Goals

Strategic planning and goal setting are ways companies seek to plan their future. However from time to time management plans are not able to be fulfilled, not because the plan is faulty, but because the resource is not in place to make the plan succeed. It is easy to tell if a plan will fail due to lack of tangible assets - not enough cash, not the right machinery and so on, but determining if the intangible assets are in place is currently difficult for the strategist to determine. Are the people we employ today the right ones to make us successful in the next century? Do we have the business processes in place which will support the goals we have set? Intellectual Capital Services will provide knowledge about such issues and help identify the gaps which must be filled if the strategy is to be successful.

2. Planning Research and Development

Why organisations undertake R&D is not always clear. The simple answer is to generate new products and services for the future, but the trade off between research to generate know-how and research to develop patents or new designs is unclear. Many organisations who keep a patent portfolio do so as a defence mechanism, as armour against some unseen threat. However, patents are expensive to maintain, and the main benefit of the R&D may not be the patent, but the know-how generated during the project. If know-how reflects competitive advantage, then organisations need to understand the nature of know-how in their possession and how to protect and grow it to competitive advantage. An Intellectual Capital Service of the R&D function will provide the knowledge needed with which to evaluate and design R&D programmes.

3. Information for Reengineering and Downsizing Programmes

When organisations decide to downsize or reengineer, decisions must be made concerning human assets. Who stays? Who is made redundant? What jobs or functions will be merged in the new organisation? These decisions are often made in a vacuum, as human assets are evaluated in an ad-hoc fashion. An Intellectual Capital Service will provide valuable knowledge for executives who are planning to reengineer or downsize, ensuring that neither of these processes inadvertently divests the organisation of valuable capability and know-how.

4. Rationale for Organisational Education and Training Programmes

It is currently fashionable for companies to refer to themselves as "Learning Organisations". In addition, organisations are ranked on how much training they provide for their employees. Whether that training is germane in enabling the organisation to meet its goals is often not considered. Training and education are a means of improving know-how and the value of Human Centred Assets. It should be considered in that light and knowledge resulting from an Intellectual Capital Service will help in planning education and training programmes which are of benefit both to the individual and the organisation.

5. Assessing the Value of the Enterprise

When valuing an enterprise businessmen look to the book value. In many organisations the book value is low, but their actual value may be high. Examples include software companies where the know-how to build software is the greatest asset the organisation possesses. Alternatively, the organisation may be really young and have few tangible assets, yet its people have track records in their own right which should be counted as intangible assets. An Intellectual Capital Service provides in-depth knowledge of the intangible assets of the organisation, which can be used to support the tangibles, giving analysts and financiers an information-rich perspective of the organisation.

6. Growing an Organisational Memory

Organisations spend huge sums of money paying for employees to reinvent the wheel. Skills possessed by individuals remain a mystery to others who have to develop them in order to do their job. The Gottilieb Duttweiler Foundation has estimated that organisations use only 20% of available intellectual capacity on a day- to-day basis. Increasing that figure could have a profound impact on the efficiency and profitability of the organisation. The IC Repository, which will contain information on "who has what skills", can be built as a result of an Intellectual Capital Service and forms the basis for an Organisational Memory. It also provides the potential to boost the 20% utilisation figure. Organisations of the future will have staff whose job it is to maintain the Organisational Memory which will become a valuable intangible asset in its own right.

The Intellectual Capital Management Process

1. The Intellectual Capital Audit

The Intellectual Capital Audit is the first step in understanding the nature and content of the Intellectual Capital of the organisation. Tasks undertaken in an IC Audit are as follows:

Task 1. Identification of Domain, Goals, and Threats.

Task 2. Audit of Human Centred Assets.

Task 3. Audit of Intellectual Property Assets.

Task 4. Audit of Infrastructure Assets.

Task 5. Audit of Market Assets.

Task 6. Status Report on IC and Recommendations for IC Restructuring.

2. Building the Intellectual Capital Repository

Once the IC of the organisation has been determined, it needs to be recorded, as it is highly dynamic and will change as the organisation grows and changes. In order to keep track of IC, the organisation will need to maintain an IC repository, which is a special type of database. Tasks in building the IC repository include:

Task 1. Design of the IC Repository and its User Interface

Task 2. Population of the IC Repository.

Task 3. Customisation of Query Systems.

Task 4. Training of IC Repository Administration Staff.

Task 5. In-house Training Programme on the Use of IC Within the Organisation.

3. Assessing Intellectual Capital Value.

Assessing the value of IC is dependent upon the goals of the organisation and the state of the market. An automatic valuation scheme needs to be designed for each organisation; based on what IC is important to them at any point in time. Tasks included in assessing IC value include:

Task 1. Ranking and Prioritising of Human Centred Assets.

Task 2. Establishing the Business Opportunity for Market Centred and IP Assets.

Task 3. Measuring the Value Added of Infrastructure Assets.

Task 4. Creating an IC Index for the Organisation.

Task 5. Integrating the IC Index with the IC Repository.

Task 6. Generate Automatic IC Valuations Based on the Index.

Intellectual Capital Policy Design

Once the organisation understands the nature of its Intellectual Capital, it needs to design a policy for growing and maintaining it, in order to assure that corporate goals are able to be achieved with the IC resources in place as and when they are needed. The interplay between corporate strategy and goal setting needs to be understood and defined, as separation of the two means that the organisation loses track of which assets it needs, and of which assets it should divest itself. Tasks undertaken in order to design the Intellectual Capital Policy include:

Task 1. Review of Strategic Goals and Threats, Short, Medium and Long Term.

Task 2. Identification of Missing and Redundant IC in order to Achieve Goals and Protect the Organisation from Threat.

Task 3. Design of Acquisition Plan for IC.

Task 4. Design of Organisational Policy on Intellectual Capital Management.

Task 5. In-house Training Programme on the IC Policy of the Organisation

In order to perform the above mentioned steps, expertise from several disciplines is required, including :

- **a.** Management skills to identify and develop hierarchies of goals and make recommendations for the restructuring of Intellectual Capital.
- **b.** Knowledge based system design skills to identify the problem space.
- **c.** Knowledge elicitation techniques to document knowledge about human centred assets.
- **d.** Intellectual property expertise to evaluate patents and so on.
- **e.** Marketing skills to identify business opportunities originating from IP and to various market assets.

Conclusions

In this paper we have proposed a preliminary taxonomy of Intellectual Capital, and we have outlined an approach to develop a methodology and system to document, track and value the Intellectual Capital of an organisation. The proposed system will support decision making about business processes such as reengineering, right sizing, growth of Learning Organisations, and exploitation of IPR. The approach we advocate here is interdisciplinary, and aims to integrate techniques drawn from a number of areas, such as marketing, psychology, management and knowledge-based system.