

MEASUREMENT, MANAGEMENT AND REPORTING OF INTANGIBLE ASSETS: A REVIEW

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Abstract *Changing business environment demands an urgent shift of focus from the tangible assets to the intangible assets. The present paper attempts to explore and analyse the major issues related to the importance of intangibles, approaches to measure intangible assets, relationship between intangibles and firm performance, and trend of disclosures related to intangibles. Intangible assets have created a new research domain. Intangibles continue to be a complex research domain. Problems associated with the domain start right from identification and definition of intangibles. Difficulties in the identification stage are passed on to measurement and reporting. The organisations are spending a huge amount of money on acquiring and creating Intangible Assets. For sustained investments, the impact of intangible assets on firm performance needs to be ascertained. With increased awareness and recognitions of these assets the future challenge will move from merely “identifying and reporting” to “nurturing and exploiting” these assets. There is a dire need for research insights on organisational level management of intangibles.*

Keyword: *Intangible Assets, Measurement, Reporting, Management, Review*

INTRODUCTION

Peter F. Drucker (1994) in his book, “The post-capitalistic society” stated in context of new society that “the mean of production” is not anymore the capital, the natural resources and the “labour” but it is and it will be the “knowledge”. Knowledge includes facts, information, descriptions, or skills acquired through experience or education. Knowledge economy refers to a system of consumption and production that is based on intellectual capital. The knowledge economy stands on three pillars. The first is knowledge has become what we buy, sell and do. The second pillar is knowledge assets i.e. intellectual capital which is gaining more importance than the tangible assets. The third pillar is to prosper in the new economy and exploit these newly vital assets. For this, we need a paradigm shift in vocabularies, management techniques, technologies, and strategies.

A major portion of the knowledge industry is human capital intensive which when combined with physical assets improves the productivity and profitability of an organisation. Given the changes in the environmental factors of the business, a company cannot excel by only focusing on the improving the physical assets of the enterprise. The changing business environment demands an urgent shift of focus from the physical assets to the knowledge assets. The profitability of a knowledge company depends not

only how it efficiently manages its physical assets but also on its knowledge assets, its ability to influence the learning ability of its professionals and enhance the reusability of its knowledge and expertise. Most of the knowledge assets can be categorised as intangible assets. In a knowledge economy, a significant portion of a company’s value is on account of intangible assets. Intangible assets of the companies are business reputation, name recognition, intellectual property, knowledge assets, know how, research and development and relationships with the stakeholders. There are numerous studies available on the concept of intangible assets, reporting and disclosure practices of intangible assets, measurement of intangible assets, and relationship of intangible assets with firm performance and management of intangible assets thereby leading to diversity in these aspects which in turn do not provide any clarification on the inferences which could be drawn from the available literature. The purpose of the research is to draw valid conclusions from the available literature related to the concept of intangible assets, reporting and disclosure practices of intangible assets, measurement of intangible assets, and relationship of intangible assets with firm performance and management of intangible assets.

The present work is aimed at providing the glimpses of the research efforts on the different aspects of Intangible Assets. Using online search of three key words ‘Intangible Assets’, ‘Intellectual Capital’, and ‘Knowledge Assets’ a set of articles were identified. Discussions in the following sections

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are based on the contents of 85 research papers. Although, the research publications included in this paper span from 1961 to 2013, the majority (58 percent) of research studies belong to the period 2001 to 2013. Articles from 38 different titles have been included. Majority of papers included in the present work are from Accounting Horizons, European Accounting Review, Journal of Intellectual Capital and Journal of Accounting and Finance. While appraising the articles, dimensions of interest included time period of the study, the industry, the country, the number of firm years and the different aspects related to intangible assets. The majority of studies were conducted in Australia, India and USA whereas the remaining studies were from other countries which included Spain, Thailand, Brazil, Romania, Korea, and France. The studies related to intangible assets have been conducted in diverse industries. No homogeneity was observed in context of classification related to industries in which the studies have been conducted. There is considerable concentration on research on Intangibles in R&D intensive firms, knowledge intensive firms, MNCs, Government organisations, banking industry, healthcare and biotechnology firms. This study contributes to the literature on account of understanding the concept of intangibles, purpose of organisations for reporting information on intangible assets, benefits of reporting information on intangible assets, type of reporting practices adopted by the organisations and value relevance of intangible assets, measurement of intangible assets and the course of relationship of intangible assets with the performance of the firms. Keeping in view the increasing importance of the intangible assets a glimpse into the literature review was conducted to get a comprehensive view of the concept of intangible assets.

This review paper is divided into five sections:

- Definition of intangible assets
- Reporting and disclosure practices of intangible assets by the companies
- Measurement of intangibles
- Relationship of intangibles with firm performance
- Management of intangibles

DEFINING AND CLASSIFYING INTANGIBLE ASSETS

A diverse framework emerges in pursuit of defining intangible assets. This framework includes the nature of these assets, their structure, the benefits accruing from these assets and the source of evolution of these assets. With time, divergent approaches have evolved for defining intangible assets based on their nature, structure and source. Accounting perspective advocates that intangible assets are the difference between the company's market and book value (Pablos, 2003; Kwee, 2008). The accounting approach is considered as a

narrow approach for defining intangible assets while the economics and management approaches are considered as broader approaches. Most of the researchers visualize intangible assets as capable of generating economic benefits in present as well as in future and a source of competitive advantage (Australian Accounting Research Foundation, 1989; Anantadjaya, 2008; Steward, 1997; Bontis, 2000; Sveiby, 1997; Cañibano, García-Ayuso, and Sánchez, 2000a). On the basis of source of intangible assets, there are diverse opinions of researchers. Some researchers say that intangible assets are generated by innovation (discovery), unique organisational designs, or human resource practices (Lev, 2001) while others consider that intangible assets are self-generated (Edvinsson, 1997; Edvinsson & Malone, 1997; Andreou, Green, & Stankosky, 2007; Steward, 1997; Cañibano, García-Ayuso, & Sánchez, 2000a).

Intangible assets act as silent performance indicators for an organisation. Traditionally these indicators were not known and valued but with the emergence of knowledge driven economies an increase in their significance has been observed. Initially intangible assets included goodwill, intellectual property and technical know-how only. In the present era brand equity, human resource, organisation structure, research and development, relationship with the stakeholders and reputation of the business have also been added to the class.

Two competing views for intangibles, narrower and broader, are prevalent. These views are based on the environment to which these belong. Former is related to the components which are internal to an organisation, while latter is related to the components which are external to an organisation. According to the narrow view intangible assets can be classified as Human Capital and Organisational Capital (Edvinsson, 1997, Roos, Roos, Dragonetti, & Edvinsson, 1997; Petty, 2000; Tovstiga & Tulugurova, 2009). The broader view on intangible assets was first identified by Brooking (1996) which included market assets, intellectual property assets, human-centred assets and infrastructure assets as constituents of intangible assets. Sveiby (1997) also supported this view by categorising intangible assets as internal organisation structures, external organisation structures and the competence of its personnel. According to the broader view intangible assets can be classified as human capital, social capital, and structural capital. Pablos (2002) and Bozzolan, Favotto, and Ricceri (2003) extended this list by including other components i.e. structural/internal capital, external/relational capital, and human capital. Kaplan and Norton (2004) contributed information capital into list of categories. Two other components i.e. partner capital and customer capital, were added to the list by Stewart (2005) and Anantadjaya (2008). Swart (2006) divides intellectual capital into five categories i.e. social capital, structural capital, organisational capital, customer

capital, and relational capital.

Intangible assets can also be classified as controllable and uncontrollable. The components which are internal and external to an organisation defined as are controllable and uncontrollable. The former includes human factors, internal organisational structure, industrial designs, etc. while the latter includes the relation with the customers, suppliers, technology related aspects, market related aspects, brand image etc.

Overall, it can be inferred that the basic definition of intangibles has remained more or less consistent during different time periods. The list of components of intangible assets has undergone a change. Some components like human capital, structural capital, organisational capital and relational capital have strong evidence in their support while partner capital, customer capital and social capital lack evidence in their support.

REPORTING OF INTANGIBLE ASSETS

Reporting of intangibles has also attracted significant attention from the researchers. Major research issues related to reporting of intangibles include:

- Purpose of reporting
- Benefits of reporting
- Voluntary v/s statutory reporting
- Reported content
- Value relevance of intangible assets

The information related to intangible assets is reported to provide information to the investors for decision making.

Purpose of Reporting

Basic purpose of reporting information is to enable the organisations to communicate important information such as management policies, corporate culture, strategies, and future prospects to the stakeholders of the organisation. It also helps the organisations to secure and develop their value. The wealth of the organisations is non-financial resources rather than financial sources of information. The reporting of this type of information helps an organisation to compete with others in the marketplace. There is a divergence between the purpose and benefits of reporting non-financial information. Organisations provide qualitative disclosure to improve investors' understanding of firms, fundamental business activities as well as influence investors' interpretations of changes in financial performance and their assessment of future prospects. The purpose of reporting is to enable the organisations to create value and prosper in future. The central motive in disclosing the intellectual capital information is to communicate corporate culture,

strategy and future direction for the purpose of branding (Saleh, Hassan, Jaffar, & Shelkor, 2010).

Benefits of Reporting

The benefits of reporting vary from organisation to organisation. These may be in context of increasing the value of the firm or to improve quality of human capital, relational capital and market related capital. As explained by Kamath (2007) the benefits of intellectual capital reporting include a true reflection of the actual worth of the company and providing insight into the drivers of sustainable performance. It supports a corporate goal of enhancing the shareholder value and it provides more useful information to existing and potential investors. Saleh *et al.* (2010) highlighted five benefits from the information disclosure i.e. to retain and attract quality employees, to retain and attract customers of company products, to lobby for more synergetic collaborations with partners, for the society, and to manage the perceptions of the capital market. It seems that including information on human resources in the annual accounts would increase the usefulness of financial statements for investment and credit decision making, especially for knowledge intensive firms. Qualitative disclosure helps market participants to bridge the gap between the financial statements and the economic reality of firms' operations (Glassman, 2003). Increased disclosure may also lead to lower information asymmetry and an increase in market liquidity (Leuz & Verracchia, 2000).

Statutory and Voluntary Disclosures

Disclosures on intangible assets may be voluntary or statutory. Voluntary disclosures are not mandatory as per the law while statutory disclosure practices are mandatory as per the law. There is strong evidence that companies across different countries emphasised on voluntary disclosure practices. At the earliest, the guidelines for the statutory disclosures were made available in Japan in the year 2002 and Germany in the year 2004. A high degree of reliance on voluntary disclosures has been observed across different industries which included biotechnology, banking, information technology and manufacturing industries. It was also observed that the major studies have been conducted to study the variables which affect the voluntary disclosure practices of the firms. Studies related to the period 1970's and 1980's found that listing status, earning margins (Singhvi & Desai, 1971) firm size, financial leverage and proportion of assets in place (Chow & Wong, 1987) affect the level of disclosure. Research efforts in 1990s support the fact that large institutional ownership results in a higher level of voluntary disclosures (El-Gazzar, 1998; McKinnon & Dalimun the, 1993; Mitchell, Chia, & Coh, 1995, Chow & Wong, 1987; Cooke, 1989; Hossain,

Perera, & Rahman, 1995; Meek, Roberts, & Gray, 1995; Raffournier, 1995). Some other variables were also identified which have an impact on the voluntary disclosure practices of the firms which included audit size or quality (DeAngelo, 1981), types of industry (Cooke, 1989; Meek *et al.*, 1995), leverage (Hossain *et al.*, 1995) and level of multinationality or internationality (Cooke, 1989; Raffournier, 1995). The belief of negative relation between the size of the firm and voluntary disclosure practices of the firms by Schadewitz and Blevins (1998) and Meek *et al.* (1995) lacked supporting evidence. However, the credence of negative relation between the firm size and voluntary disclosure got benefaction afterwards (Cerbioni & Parbonetti, 2007).

Most often and consistently identified determinants of voluntary disclosures include size of company (Chow & Wong, 1987; Watson, Surives, & Marston, 2002; Belkaoui, 2001), profitability (Haniffa & Cooke, 2002), and ownership concentration (Chau & Gray, 2002; Haniffa & Cooke, 2002; MohdGhazali & Weetman, 2006; Eng & Mak, 2003; Cerbioni & Parbonetti, 2007; Chen, Lin, & Hsun, 2006). While the voluntary disclosures have been given much more consideration in the previous literature studies, the statutory disclosure practices have not received much attention. It has been found that the statutory disclosure practices have gained importance after the accounting standards came into existence. It has been observed that the countries which adopted the international financial reporting standards in the years 2002-2007 have started adopting the statutory disclosure practices while reporting the non-financial information. The countries which have not started complying with the international financial reporting standards are disclosing only that much information which fulfils the accounting criteria and their internal requirements. It has been observed that the information which is disclosed in the financial reports is related to the goodwill, intellectual assets, research and development and other intangible assets which satisfy the accounting criteria. It means only that information is disclosed which is required under the accounting standards. For example, Ind AS 38 deals with intangible assets and the companies report the information related to intangible assets in their annual reports. The information related to employee and customer relationship, employee and customer satisfaction, skills and competence of human resource, models used in business is missing in the annual reports of the companies.

Intellectual reporting in India is in its evolutionary stage because some firms are reporting it in their annual reports while others publish these reports as a supplement to their annual report, and some others give the details of growth in their IC over the previous period in a separate section in their annual report. It has also been observed that in Australia the disclosures have increased from 1980's and the Australian organisations are more concerned with reporting

information related to R&D and human capital. Due to lack of intellectual property rights, there is weak and distorted reporting of information related to intangible assets in UK. In Spanish countries it has been observed that the more disclosures are related to the information technology and technical know-how whereas information on other intangible assets is lacking. In Romania more disclosures are related to the structural capital as compared to human capital and relational capital (Lenciu, Matis, D., & Lenciu, 2011).

Type of Information Reported

Basically, there are two types of disclosures: qualitative and quantitative. These two forms have also been termed as hard and soft information in the literature (Petersen, 2004; Engelberg, 2008; Demers & Vega, 2010; Minnis, 2010). The information related to the qualitative disclosures includes information on human resource, brand equity, employees, customers, stakeholders, policies, and strategies of the organisation. Quantitative disclosures include the information related to goodwill, patents, intellectual property and other intangible assets which are acquired by the organisations. The majority of companies disclose quantitative IA information, with both financial and nonfinancial components, rather than qualitative (Kang & Gray, 2011). Significant differences have been observed in the nature of information reported by the organisations belonging to different sectors. The organisations belonging to the service sector count on human and customer related information more than the manufacturing sector. The diversity has also been observed in the organisations belonging to manufacturing sector. The technology driven organisations emphasize on information related to intellectual capital more as compared to the R&D organisations, where research and development, technical know-how and innovativeness are given more prominence. There is clear pattern in the literature that the type of information reported by the organisations depends on the industrial sectors to which an organisation belongs.

Value Relevance of Intangible Assets

There runs a general thread in the literature that the disclosure of information related to Intangible Assets would attract more investments by the investors (Barth, Kasznik, & Nicholas, 2001; Gelb, 2002; Wyatt & Abernethy, 2008). A strong evidence in this context is also available. More information reported by the organisations on intangible assets points toward more earnings of the organisation (Roulbtone, 2011; Ling, 2013; Doukas & Padmanabhan, 2002; Carmeli & Azeroual, 2009; Su & Well, 2014; Ritter & Wells, 2006; Barth & Kasznik, 1999; Nogueira *et al.*, 2010). Reporting of information related to intangible assets also signifies that the firms are more sensitive to the financial

valuation of the firm (Bosworth & Rogers, 1998; Godfrey & Kon, 2001; Hwang & Basu, 1996). The information reported on intangible assets is also an indicator of the market value and stock prices of the firms (Riedel, 2011, Ritter & Wells, 2006; Behname, Pajoohi, & Ghahramanizady, 2012; Diviera *et al.*, 2006; Bouleune *et al.*, 2011; Sveiby, 1995; Khedri, 2012). Few studies from the nineties advocate that the effect of information reported on intangible assets on the market value can also be negative (Diamond & Verrecchia, 1991; Elliot & Jacobson, 1994; Coles, Coewenstein, & Suay, 1995; Botosan, 1997, 2006; Sengupta, 1998). Information on intangible assets demonstrates the value relevance of accounting information. It may be viewed in positive and negative sense. In positive sense it means that higher disclosures on intangible assets would lead to greater value relevance of accounting information (Collins, Maydew, & Weiss, 1997; Brown, Lo, & Lys, 1999; Rattanaphaphtham and Leemanonwarachai, 2012). The negative sense represents higher disclosure on intangible assets which would lead to less value relevance of accounting information (Lev & Sougiannis, 1996). The information on intangible assets disclosure indicates significant association with the corporate governance factors (Li, Pike, & Haniffa, 2008, Cerbioni & Parbonetti, 2007). The forecast errors are also entwined with the information on Intangible Assets. The more information reported on Intangible Assets indicates the less forecast errors (Jensen & Meckling, 1976; Gu & Wang, 2005; Hwang & Basu, 1996; Chalmers, Clinch, Godfrey, & Wei, 2012; Aboody & Lev, 2000; Chan, Lakonishok, & Sougiannis, 2001).

MEASUREMENT OF INTANGIBLE ASSETS

Measurement of intangibles can be termed as the most challenging aspect of the domain. With varied definitions and classification of intangible assets, the measurement of intangible assets has become the biggest obstacle for the organisations and researchers. The measurement of intangible assets effects the reporting of intangible assets. Broadly there are two research streams for the measurement of intangible assets i.e. IC1 - ostensive and IC2 - performative (Mouritsen, Bukh, & Bang, 2006). The IC1 - ostensive stream is related with the quantitative information and IC2 - performative is related with the qualitative information. The research studies which are based on IC1 stream used Ohlson model (1995) for the measurement of intangible assets (Kohlbeck & Warfield, 2007; Khedri 2012, Nogueira *et al.*, 2010; Huang & Wang 2008; Sahut 2010, and Behname *et al.*, 2012), other regression models (Kavida & Sivakoumar 2010; Lu, Tsai, & Cyen, 2010; Chalmers *et al.*, 2012; Heiens, Robert, & Mcgrath, 2007; Kang & Gray 2011; Li *et al.*, 2011; Oliver & Fumas, 2011; Wyatt & Abernethy 2008), and Value Added Intellectual Coefficient (VAIC) method (Murale & Ashrafali, 2010; Kamath, 2010; Nogueira *et al.*, 2010).

Besides, in a number of research studies new regression models were developed (Gao, Rong, Hou, & Chien, 2012; Pastor *et al.*, 2010; Chiucchi, 2008; Hall, 1993; Pike, Roos, & Marr, 2005; Denekamp, 1995).

Research studies based on IC2- performative stream have used content analysis (Sonnier, Carson, & Carson, 2004; Finch, 2006; Holmen, 2011; Anuradha, 2008; Kang & Gray 2011; Li *et al.*, 2008; Lenciu *et al.*, 2011; Abeysekera, 2006), survey method (Khalique, Hassan, Abdul, & Shaari, 2013; Ahmadi, Jalilian, Salamzadeh, Saeidpour, & Daraei, 2012; Yang & Lin, 2009; Chen *et al.*, 2006, Rattanaphaphtham & Leemanonwarachai 2012; Lenciu *et al.*, 2011; Shin, Lin, & Lin, 2011; Chiucchi, 2008; Srinivasan, 2006; Suraj & Ajerfuke, 2013; Lee & Lee, 2007) and event study method (Collins *et al.*, 1997).

The studies which have been conducted in Taiwan, USA, Italy, and Thailand are based on IC2 - performative stream whereas the studies conducted in India, Romania, and North America are based on IC1 - ostensive stream. Thus a similarity has been observed in the methodology adopted for the measurement of Intangible Assets across different countries. Homogeneity has also been observed in the methodology adopted in different time periods. The importance of content analysis has increased from 2000 onwards. The methodology based on survey was in use from the early 1990s and are widely used at present. The methodology for the measurement of intangible assets also varies across different industries. Majority of research studies conducted in banking industry are based on IC2 - performative stream, while the research studies which are conducted in R&D intensive and knowledge intensive firms are largely based on IC1 - ostensive stream.

RELATIONSHIP BETWEEN INTANGIBLES AND FIRM PERFORMANCE

The organisations are spending a huge amount of money on acquiring and creating intangible assets. For sustained investments, the impact of intangible assets on firm performance needs to be ascertained. Investment in intangible assets internal efficiency of an organisation, market performance of an organisation and thus, expected to result in increased profitability. The impact of intangible assets on firm performance may be direct (Heiens., 2007; Ritter & Wells, 2006; Gao *et al.*, 2012; Kavida & Sivakoumar 2010; Khedri, 2012; Agustin, Aleson, & Manuel, 2010), whereas in certain cases the impact of intangible assets on the performance of the firm may be indirect (Surroca, Tribo, & Waddock, 2010; Carmeli & Azeroual, 2009; Wiwattanakantang, 2001; Fukui & Ushijima, 2007; Doukas & Padmanabhan, 2002).

The influence of intangible assets on the performance of the

organisation can be studied in context of the nature of business, country and class of intangible assets. Intangibles manifest in diverse manner. This is evident from the research studies dealing with the investigation of the relationship between intangibles and firm performance. Table 1 summarizes the outcome of previous studies in this domain. There is overwhelming majority in favour of the argument that Research & Development efforts have significant positive effect on the performance of the firm (Gleason & Klock, 2006; Black, Jang, & Kim, 2006; Guo, Huo, & Chien, 2012; Chauvin & Hirschey, 1993; Gelb, 2002; Lu *et al.*, 2010; Hall & Hall, 2013; Sveiby, 1995; Sougiannis, 1994; Gu, 1990; Kavida & Sivakoumar, 2010; Gao *et al.*, 2012). On the other hand, research studies advocating negative relation between the R&D expenses and the performance of the firm (Heiens *et al.*, 2007; Godfrey & Kon, 2001) are clearly in minority.

Table 1: Impact of Intangibles on Firm Performance

Intangible	Relationship	Studies
R&D Efforts	Positive	Gleason and Klock (2006), Black <i>et al.</i> (2006), Guo <i>et al.</i> (2012), Chauvin and Hirschey (1993), Gelb (2002), Lu <i>et al.</i> (2010), Hall and Hall (2013), Sveiby (1995), Sougiannis (1994), Gu (1990), Kavida and Sivakoumar (2010)
	Negative	Heiens. (2007), Godfrey and Kon (2001)
Human Capital	Positive	Chen <i>et al.</i> (2006), Contractor and Mudambi (2012), Carmeli and Tisher (2004), Hale (1992), Gao <i>et al.</i> (2012), Nogueira <i>et al.</i> , 2010.
	Neutral	Hsu and Wang (2012), Elias and Scarbrough (2004)
Structural Capital	Positive	Chen <i>et al.</i> (2006), Carmeli and Tisher (2004), Hall (1992), Doukas (1995), Doukas and Travlos (1998)
	Negative	Hsu and Wang (2012), Ling (2013)
	Neutral	Ahmadi <i>et al.</i> (2012)
Intangible Assets	Positive	Murale and Ashegali (2010), Khalique <i>et al.</i> (2013), Ling (2013), Morch and Yeung (1991), Doukas and Padmanabhan (2002), Lee and Lee (2007), Matolcsy and Wyatt (2006), Ritter and Wells (2006), Khedri (2012), Collins <i>et al.</i> (1997), Godfrey and Kon(2001), Barth and Kasznik(1999), Basworth and Rogers (1998)
	Negative	Amadiou and Viviani (2010), Su and Wells (2014), Heiens <i>et al.</i> (2007)

Similar pattern may be observed in case of human capital. Literature strongly supports the fact that the impact of Human Capital on the performance of the firm is positive (Chen *et al.*, 2006, Contractor and Mudambi 2012, Carmeli and Tisher 2004, Hall 1992, Gao *et al.*, 2012 and Nogueira *et al.*, 2010). Only few studies have reported neutral relationship in this context (Hsu & Wang, 2012; Elias & Scarbrough, 2004). Structural/organisational capital also impacts the firm performance in a positive manner (Chen *et al.*, 2006; Carmeli & Tisher, 2004; Hale, 1992; Doukas, 1995; Doukas, 1998). Only a few research studies have reported contrary findings in this context. These include reporting of negative impact (Srinivasan, 2006; Ahmadi *et al.*, 2012) and neutrality (Hsu & Wang, 2012; Ling, 2013). Advertisement expenditure, treated as another constituent of intangible assets significantly pumps the performance of the organisation (Gleason & Klock, 2006; Chauvin & Hirschey, 1993; Black *et al.*, 2006). Advertisement expenditure may not provide substantial benefit for some organisations where the accounting methods are not adequate (Heiens, 2007; Godfrey & Kon, 2001). Apart from the impact of individual asset categories on firm performance, the overall impact of the intangible assets has also been investigated. Majority of research studies support the fact that there is a positive association between the intangible assets and firm performance (Murale & Ashegali, 2010; Khalique *et al.*, 2013; Ling, 2013; Domingo *et al.*, 2010; Morch & Yeung, 1991; Doukas & Padmanabhan, 2002; Lee & Lee, 2007; Matolcsy & Wyatt, 2006; Ritter & Wells, 2006; Khedri, 2012; Collins *et al.*, 1997; Ashrafali, 2010; Godfrey & Kon, 2001; Barth & Kasznik, 1999; Basworth & Rogers, 1998). The notion of negative association between the intangible assets and firm performance does not get strong support (Amadiou & Viviani, 2010; Su & Wells, 2014; Heiens *et al.*, 2007).

Effect of intangible assets on firm performance varies across sectors. A significant relation can be seen in biotechnology, pharmaceuticals, and information technology; largely R&D and knowledge intensive firms. The firms from food and agricultural sector depict a negative relation. The organisations belonging to banking, insurance and local government authorities have exhibited neutral association between intangible assets and performance of the firm. Diversity has been observed with regard to the relation between intangible assets and performance of the firm across different countries. Majority of studies conducted in the USA, the UK, and France advocate negative relationship between the intangible assets and performance of the firm. The studies from Israel and Taiwan fail to find any relationship, while all other studies from developing countries have shown a positive association.

MANAGEMENT OF INTANGIBLES

The transition of the economies from capitalist to knowledge and technology driven demands an urgent shift of focus from the financial resources towards non-financial resources of information. The focus of the organisations is shifting from 'tangibles' to 'intangibles'. Various methods have evolved for measuring the intangible assets and what can be measured needs to be managed. The need for managing intangible assets arises from the fact that major portion of the value of the firm is derived from intangible assets. Intangible assets are also considered as a source of competitive advantage for the firm. The changing nature of the global economy requires dynamic management at firm level (Eisenhardt & Martin, 2000; Henri, 2006b; Teece, 1998; Witcher & Chau, 2007). Managing intellectual capital would help in sustaining the global competitive edge provided by Intellectual Capital depend on developing and implementing an integrated business strategy (Brown *et al.*, 1999, Schiller, 2005; Leitner & Warden, 2005). Management of intangibles helps in improving the performance of the organisation (Wu *et al.*, 2006). Not much literature is available related to the management of intangible assets at firm level. The studies available on intangible assets have not clearly brought up the issue of management of intangible assets. The issue of management of intangible assets at the organisational level is still unmapped and lot of research opportunities are available in this domain.

The important factors which affect the management of intangible assets are the structure of the organisation, accounting standards, entrepreneurial skills of members of the organisation, organisational behaviour, and policies. The responsibility of managing intangible assets lies with the managers, technical experts, and top brass of the organisation. Intangible assets are complex in nature and involve profound understanding of the aspects related to intangible assets which are scarcely available in the organisations. Major obstacles in managing intangible assets involve lack of effective communication among the members of the organisation, lack of knowledge about intangible assets, inadequate standards for managing intangible assets, lack of managerial skill, and ineffective organisational structure. Major challenge in managing intellectual capital is to transform human and relational capital into more permanent structural capital.

DISCUSSION

In wake of knowledge economy, intangible assets have created a new research domain. A new research domain often carries lot of complexity and diversity across the research issues. Over a period of time, structured definition and dominant terms emerge shaping the research domain. Intangibles are no

exception in this regard. Given, the new dynamics added by internet and rise of social media, likelihood of solidification of literature in the field of intangibles remains quite limited. Complexity and diversity can be seen in terms of definition, classification, measurement, impact on firm performance and management of intangibles. Intangibles continue to be a complex research domain. Problems associated with the domain start right from identification and definition of intangibles. Difficulties in the identification stage are passed on to measurement and reporting. Ultimately, it becomes difficult to establish a relationship between intangible assets and firm performance.

Early on major focus of research was on structural /internal capital in line with resource based perspective of looking at business. Over a period of time relational capital has also gained ground along with capital. Relational capital concept is more inclined towards the market based perspective. In a world dominated by service sector, relational capital, and human capital are expected to assume more importance in future. Three major categories of intangibles represented by structural capital, relational capital, and human capital have got wide support from the research efforts in the domain till date.

Broadly there are two methods for measurement of intangible assets- qualitative and quantitative. The research based on quantitative methods uses the model building approach such as regression models, Ohlson model, and VAIC method. On the other hand, the research based on qualitative methods uses the content analysis, survey method, and event study method. Major focus has been only on the content analysis, quantitative, or qualitative methods for measurement of intangibles but very few studies have emphasised on model building aspect. A hybrid approach which is a mix of qualitative and quantitative aspects can be put to use. Diversity has been observed in the methodologies used for measurement of intangible assets across different countries. The studies which have been conducted in Taiwan, USA, Italy, and Thailand are based on IC2- Performative stream whereas the studies conducted in India, Romania, and North America are based on IC1- ostensive stream. Similarly diversity has also been observed in the methodologies used in different time periods.

The major benefits of reporting of intangible information include improving efficiency of the firm, corporate reputation, and ability to attract quality human resources. Disclosure of intangibles also helps in increasing the liquidity of the stocks of the firm. Contrary to this, the financial reports of the organisations do not reflect the value of intangibles accurately. Also, the information reported is incomplete as it includes only the information on some intangible assets such as goodwill, R&D expenditures, patents etc. While the information on other intangible assets such as customer

base, human capital, and relationship with stakeholders are omitted from the financial reports.

Having an asset and leveraging the same to full potential are two different ball games, Majority of the research has focused on investigating the relation between these assets and firm performance, but there is lack of knowledge regarding how the intangibles can be exploited at the best. With increased awareness and recognitions of these assets the future challenge will move from merely “identifying and reporting” to “nurturing and exploiting” these assets. With increasing recognition of intangibles, more and more companies are expected to measure and report these assets. Only those intangibles are managed and reported which have an effect on the long term performance of the organisation and not all the resources that are managed are reported for the use of shareholders. The management of intangibles helps in improving the strategic positioning of the organisation, helps in minimizing the risks of the organisations, helps in increasing the revenues of the organisation and helps the companies to know about the exploitable intangible assets. Majority of the research efforts have analysed intangibles on sector/industry bases. For nurturing and leveraging intangibles firm specific management is of utmost importance. There is a dire need for research insights on organisational level management of intangibles.

In case of relationship between intangibles and firm performance, differences across sectors have been observed. These differences may be on account of the difference in appropriability of intangibles. Appropriability may differ on account of the protection regimes available across sectors, nature of intangibles and the tendency of firm to leverage intangibles for business efficiency. Normally, process industries are less motivated to protect their intangibles and prefer to use the same for enhancing process efficiency. Available evidence suggests that intangibles are able to provide competitive advantage in developing economies. On the other hand, their utility on the same dimension seems to have decreased in context of developed countries. Level of awareness about intangibles, attention paid and scope for creating a gap may be the possible context reason in this context. It can be expected that firms from developing countries are still having a window of opportunity, while this window may be closing in case of developed nations. In majority of the research studies, intangible assets have been dealt in isolation. For instance, when it comes to linking intangibles with firm performance, the major focus is on intangible alone. Not much evidence is available with respect to their inter linkages i.e. between one type of intangible and another. Further, the research domain, involving interaction between tangibles and intangibles and the resultant effect on firm performance, remain almost ignored.

Despite the rising importance of intangibles, information asymmetry between reporting tangibles and intangibles

can be clearly seen. Different accounting treatments are employed for physical assets and intangibles. These differences have widespread implications for various stakeholders such as investors, analysts, managers, and policy makers. Disclosure practices are influenced by the size of the organisations, diversity of the business conducted by the organisations, accounting standards adopted by the organisations and the industry sector to which the organisation belongs. Accounting policies add more fuel to this confusion starting right from the debate that whether intangibles, given the broad definition, should be expensed or capitalised. Subjective reporting and qualitative disclosures offer a possible solution. But these approaches are not free of limitations. Firstly, subjective reporting and qualitative disclosures may not provide the correct picture and may suffer on account of important dimension of disclosure i.e. faithful representation. In the past, there have been concerns about meaningful and useful disclosures. Despite the progress of the research domain, these concerns are far from being addressed. As a consequence, firms struggle to make full revelations on intangibles. Secondly, qualitative disclosures are subjective in nature making it more difficult for the information receivers such as retail investor, analysts and policy makers to comprehend and act on the information. There is an urgent need to structure and regulate the qualitative disclosures so that it is easier to make to make inter and intra industry comparisons. Further the available evidence does not strongly relate qualitative disclosures with the firm performance. Therefore, there is need to investigate this issue more vigorously.

Given the pace of knowledge economy, in future, higher proportion of firm performance is expected to be driven by intangibles, there for there is a need to develop standardised formats and regulatory approaches to deal with the issues related to intangibles. As of now, accounting standards across the countries differ and as the countries are heading towards adopting international financial reporting standards, a common reporting platform would be available and thus the difficulty would be reduced.

CONCLUSION

The present work has been undertaken to understand various dimensions and research streams in the domain of intangibles. Findings and discussion of the paper are based on the systematic review of the contents of 85 research studies. Major dimensions identified through the review have been presented in this paper. It can be concluded that intangibles are important assets for the organisation. Importance of intangibles and investment in intangibles are on a rise. Investment in intangibles helps in increasing the value of the firm. Finally, only identifying, reporting and valuation of intangibles are not important but the management of

intangibles is equally important. The companies which identify as well as manage their intangibles are more likely to succeed than the organisations which do not concentrate on the management of intangibles. Domain of voluntary disclosures needs to be explored in greater details, as it will help in improving the quality of information and the impact of voluntary disclosures on other dimensions such as firm performance. Techniques for measurement of intangibles are not standardised. Management of intangible assets is a field which needs lot of exploration. Research is required on policies, culture, and other variables which have an impact on managing intangible assets. However there are certain limitations to the study conducted which include the aspects related to intangibles which have been covered in the study. Although an attempt has been made to include all the relevant studies but complete exhaustiveness cannot be achieved. The future studies can be conducted in studying the detail of the voluntary and statutory disclosure practices adopted by the firms and management of intangible assets.

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