Analysis Of Intellectual Capital: A Study Among Select Companies In India

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Abstract

Intellectual Capital (IC) refers to the intangible assets—such as knowledge, skills, relationships, and organizational processes—that contribute significantly to a company's value and performance. Though not reflected in traditional financial statements, IC has emerged as a critical driver in today's knowledge-based economy. The study explores the concept, components, and importance of IC, with a focus on companies listed on the Bombay Stock Exchange (BSE). Based on secondary data, the study examines how these firms measure, report, and manage IC, which is broadly categorized into three components: Human Capital, Structural Capital, and Relational Capital. As globalization and technological advancements intensify market competition, intangible assets like IC have become essential for gaining a sustainable advantage. The research aims to understand existing models of IC measurement, evaluate the IC performance of selected BSE-listed companies, and rank them based on their IC scores. Highlighting the growing recognition of IC in Indian businesses, the study underscores the need for better frameworks to value and disclose these assets. This work contributes to enhancing awareness about the strategic importance of Intellectual Capital in business valuation and long-term competitiveness.

Key words: Intellectual Capital, Structural Capital, Human Capital, BSE Listed Companies, VAIC Model,Intangible Assets,IC Efficiency

Introduction to Intellectual Capital

Intellectual Capital (IC) refers to the intangible assets that contribute to a company's performance and long-term value. Emerging in the 1960s alongside the knowledge economy and technological advances, IC has become essential for gaining competitive advantage. J.K. Galbraith first coined the term in 1967, defining it as the outcome of intellectual action that creates value. Unlike tangible assets, IC is not recorded in financial statements, yet it plays a significant role in determining a firm's market value.

In today's knowledge-driven economy, success relies more on expertise, innovation, and relationships than on physical assets. With globalization and technological progress, intangible elements such as skills,

processes, and stakeholder relationships have become key business drivers. Despite this, traditional accounting practices struggle to measure and report these intangible assets effectively.

Brooking (1996) defines intellectual capital as the combined intangible assets that enable a company to function. The Organisation for Economic Co-operation and Development (OECD, 1999) categorizes IC into two broad types: human and structural capital. However, most models today divide IC into three components:

1. **Human Capital** – The knowledge, experience, and abilities of employees. It is not reflected in financial statements but is vital to innovation and productivity.
2. **Structural Capital** – The supportive infrastructure, processes, and databases that sustain human capital. It remains within the organization even when individuals leave.
3. **Relational Capital** – The value derived from a company's relationships with customers, suppliers, investors, and other external stakeholders.

These components collectively determine a company's ability to innovate, compete, and grow sustainably. In Indian contexts too, IC is gaining recognition as an essential strategic asset. This study is based on secondary research to explore how IC is understood, measured, and utilized by companies listed in Indian stock exchanges.

Statement of the problem

In today's competitive environment, relying solely on tangible assets is no longer sufficient for business success. Intangible assets, particularly Intellectual Capital (IC), play a crucial role in enhancing a firm's financial performance. This study seeks to evaluate the Intellectual Capital of companies listed on the Bombay Stock Exchange (BSE).

Scope of the Study

This project centers on the analysis of Intellectual Capital among selected Indian companies. It explores the definitions, components, and conceptual foundations of IC, and examines how different organizations listed on the BSE manage and report their IC. The study also includes methods of measuring Intellectual Capital and ranks the selected companies based on their IC scores.

Need for the Study

With the growing importance of knowledge-based resources, there is a need to assess and understand the Intellectual Capital of firms. This study aims to quantify and analyze the IC of BSE-listed companies, helping to highlight its significance in business valuation and performance.

Objectives

- To understand the concept and methods of measuring Intellectual Capital.
- To evaluate the Intellectual Capital of selected companies listed on the Bombay Stock Exchange.

Research methodology

Research methodology refers to the systematic procedures and techniques applied to identify, gather, process, and analyze information relevant to the study topic.

Research Design

This study is based entirely on secondary data. Comprehensive information related to Intellectual Capital and its various components has been collected and analyzed.

Sources of Data

- Published annual reports

  Moneycontrol.com

Tools for Data Analysis

- Percentage analysis
- Mean, median, and standard deviation

VARIABLES

The construct measurement is defined by building upon previous works in the field of IC and then introducing measures that serve as best proxies for constructs in the conceptual model. The primary method used to obtain data that would allow construct measurement is the VAIC model. The procedures to measure different constructs in the VAIC model are described below.

❖ VAIC Model

According to the VAIC model, the value added is the difference between output and input:

$VA = OUT – IN,$

where VA is the value added for the company, OUT is the total sales (revenues), and IN is the cost of brought-in materials, components and services. Value added can be calculated from existing information in annual reports as follows:

$VA = OP + EC + D + A$

Where OP is operating profit, EC is employee costs, D is depreciation, and A is amortization. Consistent with the literature, the value added would be the sum of labour expenses, corporate taxes, dividend, interest expenses, amortization and depreciation, minority shareholders, and retained earnings. VAIC calculates the efficiency of both intellectual capital and financial capital. Partially based on the Skandia Navigator intellectual capital measurement model, VAIC is composed of human capital and structural capital. VAIC does not consider expenditures on employees as a part of input. This denotes that expenses related to employees are not treated as cost but represent an investment. As a result, the of human capital efficiency (HCE) is calculated as follows:

$HCE = VA/HC$

Where HCE is the human capital efficiency coefficient for the company, VA is value added and HC is the total salaries and wages for the company. Structural capital, the second component of IC, is calculated as follows:

$SC = VA - HC$,

where SC is the structural capital for the company, VA is value added, and HC is the total salaries and wages paid. Based on the above calculation, structural capital efficiency (SCE) is:

$SCE = SC/VA$,

where SCE is the structural capital efficiency for the company, SC is the structural capital and VA is the value added. Intellectual capital efficiency (ICE) is calculated as the sum of the partial coefficients of human and structural capital:

$ICE = HCE + SCE$

where ICE is the intellectual capital efficiency coefficient, HCE is the human capital efficiency coefficient, SCE is the structural capital efficiency coefficient.

Pulic (2004) argued that to have a broad picture of efficiency of value creating resources, it is important to take financial and physical capital into consideration. The efficiency of the financial capital employed can be obtained in the following way:

$CEE = VA/CE$

Where CEE is the capital employed efficiency coefficient, VA is value added, and CE is the book value of the net assets of the company. Overall value creation efficiency is simply the sum of all value creation efficiency indicators:

$VAIC = ICE + CEE$

❖ Modified VAIC (MVAIC)

Modified VAIC is a comprehensive measure of IC based on VAIC™ model. It is started with calculating VA by using the formula proposed by Pulic (2000):

$VA = OP + EC + D + A$

where OP is operating profit, EC is employee costs, D is depreciation and A is amortisation. According to Pulic (2004), VAIC™ is the sum of intellectual capital efficiency (ICE) and capital employed efficiency (CEE), while ICE is human capital efficiency (HCE) plus SCE. The formula to calculate HCE is as follows (Pulic, 2000):

$HCE = VA / HC$

where HCE, human capital efficiency: ratio of VA to HC; VA, value added; HC, human capital: total salaries and wages.

$SCE = SC / VA$

where SCE, structural capital efficiency: ratio of SC to VA; SC, structural capital:
$VA - HC$.

While in this MVAIC, Ulum (2015) adds the third component of IC, i.e. relational capital efficiency (RCE). RCE illustrates the efficiency of investment in relational aspect. In this context, relational capital is proxied by marketing costs:

$RCE = RC / VA$

where RCE, relational capital efficiency: ratio of RC to VA; RC, relational capital: marketing costs (Nazari and Herremans, 2007). Pulic (2004) argued that to have a broad overview of the efficiency of all resources, it is important to take the financial capital and physical capital (capital employed) as one of the considerations. The efficiency of capital employed is calculated by (Pulic, 2000):

CEE = VA / CE

where CEE, capital employed efficiency: ratio of VA to CE; CE, capital employed: book value of total assets. Thus, the complete formula of MVAIC is:

$$MVAIC = ICE + CEE \quad ICE = HCE + SCE$$
$$+ RCE$$
$$MVAIC = HCE + SCE + RCE + CEE$$

Review of Literature

This review synthesizes existing research on Intellectual Capital (IC), focusing on its components, measurement, disclosure practices, and its impact on organizational performance. The literature reveals consistent evidence supporting the relevance and growing importance of IC in both academic inquiry and corporate strategy.

1. Intellectual Capital and Business Performance

Several studies have established a strong link between IC and organizational performance:

- **Bontis (1998)** identified a significant and reliable causal relationship between various dimensions of IC and business performance.
- **Chen et al. (2004)** confirmed a positive correlation between IC components and company performance, validating the IC measurement models used in practice.
- **Tiwari et al. (2018)**, examining 39 banks listed on the Bombay Stock Exchange from 1999 to 2015, found that human and structural capital significantly impacted bank performance.

2. Components and Conceptual Understanding of IC

IC is commonly broken down into three core elements: human capital, structural capital, and relational capital.

- **Daum (2003)** explained the interdependent nature of these three components. Human capital involves employee capability; structural capital transforms knowledge into organizational assets like patents; and relational capital sustains stakeholder relationships.
- **Choong (2008)** emphasized IC as intellectual assets that are captured, formalized, and leveraged, driving innovation and future organizational success.
- **Halim (2010)** found high correlations among human, structural, and relational capital, suggesting they work in tandem (HC–SC: 0.88, SC–RC: 0.87, HC–RC: 0.81).

3. IC Measurement and Evaluation Frameworks

- **Gopika et al. (2004)** developed a comprehensive IC valuation framework, integrating people, processes, and technology with social and financial outcomes.
- **Ginesti et al. (2018)** used regression analysis on 452 Italian companies and demonstrated that human capital efficiency was a key determinant of corporate reputation.

4. Disclosure Practices and Reporting Trends

The lack of formal reporting standards has led to inconsistent IC disclosures:

- **Brennan (2000)** criticized the traditional accounting system for failing to capture the value of intangibles due to the absence of disclosure requirements.
- **Abeysekera (2008)** analyzed top Sri Lankan firms and found a rising trend in IC disclosure, though with noticeable variation when compared to Singaporean firms.
- **Taliyang et al. (2014)** conducted a content analysis of 185 Malaysian firms and found that 69% disclosed IC-related information, particularly in the financial services sector.
- **Bhasin (2015)** revealed that IC disclosures among Indian and Australian IT firms were limited and primarily narrative, attracting little managerial focus.

5. Industry-Specific Observations

- **Ginesti et al. (2018)** showed that IC significantly affects reputation in Italian firms.
- **Tiwari et al. (2018)** emphasized the banking sector, where IC—especially human and structural capital—proved crucial in enhancing financial performance.

DESCRIPTIVE STATISTICS AND MAJOR FINDINGS

Descriptive statistics (Full sample)

Table 1

Descriptive Statistics of Intellectual Capital

	VA	HC	RC	CE	SC	IC
Mean	11610[*]	5290	1509	48514	6320	12276
Median	1235	548	127	9656	676	1367
S.D	69353	38550	6474	163465	33687	72673

* Rupees in Millions (Rounded the figures with nearest one)

Table 2

Descriptive Statistics of Intellectual Capital in the Year-2020

	VA	HC	RC	CE	SC	IC
Mean	10000	4908	1424	44931	5092	10711
Median	1149	551	123	8725	578	1292
S.D	60736	35141	5939	148204	26535	64396

Table 3

Descriptive Statistics of Intellectual Capital in the Year-2021

	VA	HC	RC	CE	SC	IC
Mean	11153	5077	1393	47766	6075	11717
Median	1136	521	112	9423	628	1238
S.D	65756	37042	6094	160418	30980	68508

Table 4

Descriptive Statistics of Intellectual Capital in the Year-2022

	VA	HC	RC	CE	SC	IC
Mean	13676	5884	1711	52844	7792	14401
Median	1427	595	146	10500	829	1563
S.D	80162	43080	7308	180352	41722	83753

Major Findings

o The average Intellectual Capital ranges 12276 during the year 2020-2022 & with standard deviation of 64396.

o The mean IC vary from 10711 to 14401 between 2020-2022

o The mean ICE vary from 2.78 to 3.43 between 2020-2022

o 2022 report the highest amount IC with 83753

o The MVAIC ranges during the years 2020-2022 is 3.12

o The mean MVAIC vary from 3.23 to 3.84 between 2020-2022

o 2021 report with highest S.D of 29.95

o The mean HCE ranges 2.27 to 2.77 during the year 2020-2022 in ICE

o The S.D of HCE vary from 8.59 to 29.59 in 2020-21

o SCE mean ranges 4.73 during 2020-2022

o The S.D of SCE vary from 1.22 to 7.93

o The mean of SCE vary from 0.51 to 0.66

o The median of SCE ranges from 0.59 to 0.63

o   The highest mean in RCE is 0.23 in 2020

o The SD of RCE vary from 0.66 – to the highest of 0.76

o The mean CEE vary from 0.19 – 0.21

o The median of CEE vary from 0.16 – 0.17

o The SD of CEE vary from 8.59 – 10.75

o The median of MVAIC ranges 3.31

o The mean HCE of MVAIC ranges from -0.47 – 1.88

o Median HCE of MVAIC ranges from 1.5 – 1.70

o The highest S,D of MVAIC is 13.97 in the year 0f 2021

❖ Business services and consultancy

o The mean MVAIC results 3.12

o The mean HCE vary from -0.47 to 1.88

- o The SD of HCE vary from 11.94 to 5.46

- o The mean RCE vary from (-0.10) to 0.041

- o The highest mean SCE 1.02 in 2022

- o The SD of CEE vary from 0.47 to 0.51

- o The mean MVAIC 3.18 in 2022 is the highest

- o The SD, MVAIC ranges from 12.06 to 14.02 in 2020-22 and 2022 SD results the lowest with 5.53

❖ Computer software

- o The mean ranges 2.29 ,median with 2.58 and SD with 3.41 in 2020 – 22

- o The mean MVAIC ranges from2.18 to 2.58 in 2020 – 21

- o HCE mean results 1.53

- o HCE mean vary from 1.33 – 1.51

- o HCE median vary from 1.54 – 1.60

- o RCE mean ranges 0.031 in 2020 – 22

- o RCE mean vary from 0.031 to 0.041

- o RCE ,SD is the highest with 0.089 units

- o SD of CEE results the highest with 0.44 units in 2020

- o SCE ranges mean with 0.28 median with 0.38 and SD with 0.94

- o The highest SCE mean is 0.36 with median 0.39 in 2021

- o The highest SD of SCE results 0.70 in 2020

❖ Cement Industries

- o The mean MVAIC ranges 4.97 with median 6.16 and SD with 6.96

- o The mean HCE vary 1.96 – 3.53

- o The median HCE vary from 3.68 – 4.25

- o The mean RCE vary from 0.13 – 0.14

- o The median RCE vary from 0.14 – 0.15

- o The SD of RCE with highest is 0.12 in 2020

- o SCE mean vary 0.71 – 0.76 in 2020-21

- o SCE median vary 0.73 – 0.76

- o SD of SCE vary 0.13 – 0.15

- o CEE mean vary 0.13 – 0.14

- o CEE median vary from 0.14 – 0.15

❖ Cotton and blended yarn

- o The mean MVAIC is 3.21 median with 3.04 and SD with 2.75
- o HCE mean vary from 1.44 to 3.002
- o HCE median vary from 1.64 – 2.72
- o SD of HCE vary from 2.32 – 2.49 in 2020-21
- o SD of RCE vary 0.16 to 0.18
- o SCE mean vary from 0.53 to 0.77
- o SCE median vary from 0.44 – 0.70
- o SD of SCE vary from 0.48 – 0.55
- o CEE mean vary 0.15- 0.19
- o CEE median vary from 0.15 – 0.24
- o SD of CEE vary from .36 – 3.19 in 2020 - 21
- ❖ Diversed Non-Financial Services
- o The mean MVAIC is 2.98, median with 3.21 and SD with 3.76
- o HCE mean vary from 0.21 – 0.23
- o HCE median 0.18, median with 0.18 and SD with 0.43 reports the highest in 2021
- o SCE mean vary from 0.58 – 0.75
- o CEE mean vary 0.21 – 0.23
- o CEE median with 0.18 results the highest in 2020
- ❖ Drugs And Pharmaceuticals
- o The man MVAIC 3.73 median with 3.9 and SD with 2.65
- o HCE mean vary from 2.74 to 3.15
- o RCE median ranges 0.16
- o SD of RCE vary from 0.14 to 0.59
- o SCE mean vary 0.41 – 3.63
- o CEE mean vary 0.21 to 0.22
- o SD of CEE results 0,12 in all 3 years
- o CEE median vary 3.58 - 4.29 in 2020-21
- ❖ Hotel and restaurants
- o The mean MVAIC is 2.71, median with 2.61 and SD with 3.78
- o The mean HCE is 2.25
- o HCE median with 2.02 and SD with 1.20 reports the highest units
- o RCE mean 0.16 results the highest
- o RCE median vary 0.9 to 0.36 units

- o SCE with SD of 6.91 is the highest in 2021

- o SCE mean 1.92 is the highest in 2021

- o CEE median 0.15 and SD with 0.25 is the highest in 2020

- ❖ Housing construction

- o Mean MVAIC is -1.15 , median with 2.90 and SD with 8.68

- o HCE mean reports -044

- o HCE median vary 16.15 – 18.67

- o RCE median vary 0.008 to 0.004

- o SCE mean reports 1.05 as highest in 2021

- o SD of SCE vary 0.60 to 1.90

- o CEE median 0.037 and SD of0.065 is highest in 2021

- ❖ Industrial construction

- o The mean MVAIC -1.88, median 3.64 and SD with 95.26

- o HCE mean vary -1.36 – 2.37

- o HCE median vary 2.61 – 2.95

- o SD of RCE vary 0.24 – 0.063

- o SCE mean vary 0.66 to 0.99

- o SCE median vary 0.64 – 0.69

- o CEE mean 0.079 – 0.10

- o SD of CEE vary 0.095 – 0.12

- ❖ Infrastructural construction

- o The mean MVAIC 1.43 median with 3.44 and SD with 14.13

- o HCE median vary 2.48 – 2.62 in 2020-21

- o SD of HCE vary 5.36 – 22.99

- o RCE mean ranges 0.36

- o SCE mean vary -0.14 – 0.47

- o SCE median vary 0.63 – 0.73in 2020-21

- o CEE mean 0.15, median with 0.20 and SD with 0.10 is highest in 2020

- ❖ Other chemical products

- o Mean MVAIC 4.95 , median with 5.05 and SD with 2.32

- o HCE mean vary 3.75 – 4.03

- o HCE median ranges 4.14 in 2021

- o   RCE mean ranges 0.18 to o.15

- o   SCE mean 0.81 is highest in 2022

- o   CEE median remains the same 0.19 in 2020- 2022

- o   SD of CEE 0.14 repots the highest in 2022

- ❖ Retail trading

- o   Mean MVAIC 5.54, median with 3.38 and SD with 9.87

- o   HCE mean 3.90, median with 2.47 and SD with 4.05 is the highest in 2020

- o   RCE mean 0.31 and median 0.17 is the highest in 2020

- o   CEE 0.20 mean and SD of CEE 0.12 is reported as the highest in 2022

- ❖ Steel

- o   Mean MVAIC 5.19, median 4.53 and SD 5.49

- o   HCE vary 2.24 – 6.66

- o   HCE median vary 2.35 – 5.56

- o   SD of HCE vary 3.13 – 5.63

- o   RCE mean 0.29 is highest in 2020

- o   SCE mean vary -0.17 – 0.80

- o   SCE median vary 0.61 – 0.83

- o   CEE mean vary 0.07 – 0.18

- o   CEE median vary 0.08- 0.18

- o   SD of CEE vary 0.10 – 0.12

- ❖ Wholesale

- o   Mean MVAIC ranges 6.38, median 3.76 and SD 18.69

- o   HCE mean 5.98 results the highest in 2021

HCE median vary 2.52-2.97

- o   RCE median ranges 0.20 – 0.19

- o   SCE mean vary 0.62 – 0.68

- o   SCE median vary 0.66 – 0.73

- o   CEE mean with 0.16 and median with 0.13 and SD with 0.18 is the highest among 2020-2022

- ❖ Business group

- o   Mean MVAIC 3.79, median 3.54 and SD 9.71

- o   HCE mean vary 1.78 – 3.84

- o   HCE median vary 2.33 – 2.61

- o SD of HCE vary 0.42 – 13.24

- o RCE median vary 0.12 – 0.72

- o SCE median vary 0.60 – 0.063

- o CEE mean vary 0.20 – 0.21

- o CEE median vary 0.15 – 0.17

- o SD of CEE vary 0.18 – 0.19

- ❖ Standalone

- o Mean MVAIC 2.80, median with 3.21 and SD with 20.99

- o HCE median vary 2.22 – 2.34

- o RCE mean remains the same 0.10 in 2020-2022

- o CEE mean 0.21 and SD with 0.28 is the highest in 2020

- o SCE mean vary 1.59 – 0.63

Suggestions

- Companies should incorporate the measurement and reporting of Intellectual Capital (IC) in their annual financial statements to enhance transparency and stakeholder understanding.
- Existing IC measurement models need to be empirically and statistically validated to ensure their reliability and applicability across different sectors.
- Standardized reporting practices should be adopted to ensure consistency and comparability of IC values among companies.

Limitations of the Study

- The study is based solely on secondary data related to Intellectual Capital, without the use of primary data collection methods.
- No questionnaire or survey was administered to gather direct insights from industry stakeholders.
- The research relies on a limited number of secondary sources, which may restrict the comprehensiveness of the findings.
- The methodology adopted for collecting and analyzing secondary data may not fully align with the objectives of the study.
- The absence of updated or current data could affect the accuracy and relevance of the conclusions drawn.
- Due to these constraints, the study may not offer a complete representation of the current scenario regarding Intellectual Capital.

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