Human Capital Accounting and Value-Added Performance
A Case Study of a Major Indian Port

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Abstract
The main purpose of this paper is to provide empirical data to show the relationship between human capital and value-added contribution of Visakhapatnam Port. Human capital was measured through the Modified Lev and Schwartz Model, whereas value-added contribution was measured through the Serge Evraet model. The Port of Visakhapatnam was chosen as a case for this study as it is one of the fastest growing major ports in India, with human resources of about 6000. This paper reviews literature on both human capital accounting and value-added performance. Valuation of human Capital was measured through the modified Lev and Schwartz model whereas value-added performance was derived from the equation developed by Serge Evraet and Ahmed Riahi Belkaoui. Correlation matrix was administered to test the statistical significance of the correlation between the ages and grades of the employees and value-added performance of the organization. Findings showed positive correlation between the different ages and grades of employees and value-added performance of the port. The results provide a tool kit for practical application of human capital accounting and value-added performance in the port in particular and Indian industry in general.

Keywords: human capital – accounting – value added performance – measurement – influence – models – managerial implications – major port organization – India
Introduction and Significance

Intellectual capital is one of the buzzwords of the knowledge society. The concept lay dormant for two centuries after Adam Smith first introduced it, but it was revived in the 1960s by American Economists, such as Gary Becker and Jacob Mincer, who then exported it triumphantly around the world. Value-added statements are also gaining importance in today’s corporate world as another source of disclosure of corporate performance (Burchell, Clubb and Hopgood, 1985).

It has been established through various studies that human capital provides a significant competitive advantage to a firm. The vast literature on human capital shows that organizations need to recruit, nurture and retain talents so that the knowledge base can be expanded, in order to provide the capacity to improve an organization’s overall performance (Becker 1964; Pfeffer 1994; Boxall; 2003; Lin and Wang, 2005; Lynn and Lim, 2009). This view is based on awareness that knowledge, skills, and expertise are embedded in individuals, who are ultimately responsible for the creation of wealth and maximization of firm’s performance (Guest, 2003; Giszpence, 2003).

Intellectual capital is widely perceived as an essential source of a firm’s performance (Lev, 2001). However, the contribution of human capital to a firm’s performance is usually not subject to mandatory disclosure. The value-added reporting issue has been a continuous subject of debate in the international accounting literature (Beattie, 1970; Bentley, 1981; Burchell et al., 1985; Chua, 1977; Pendrill, 1977). There has been mounting pressure towards financial performance measures as substitutes for traditional accounting-based earning per share measures (Ittner and Larcker, 1998). Of these, value-added (VA) measure has received substantial attention in the academic literature. It has been highlighted that many companies have adopted VA as a measure of a firm’s performance, as an analytical tool to make portfolio selection decisions, and as a management discipline (Teitelbaum, 1997).

Value-added information provides not only economic but social information by identifying the portion of output, e.g. labor, taxes, etc., that goes to each participant of the process of a company, say its stakeholders, Thus, value-added measure is a much broader performance measure than net income measure.

This study establishes a systematic relationship between human capital accounting and value-added performance of Visakhapatnam Port, the fastest growing major port on the east coast of India, from 1998-99 to 2007-2008. We measured the human capital of the Port through the modified Lev and Schwartz Model whereas for measuring value-added performance of the Port,
we applied Serge Evraet, and Ahmed Riahi Belkaoui value-added equation. Findings from this study will help determine if Indian firms appear to continue to rely on traditional business practices and perceptions (that is, a reliance on natural resources for wealth creation) or are shifting towards a greater reliance on human capital factors of production in determining productivity, profitability and market valuation.

Theoretical Background

Donaldson and Preston (1995) argued that an organization obtains its resources from its investors, employees and suppliers to produce goods and services for its customers. Similarly, more recent theoretical views establish that investors, employees, suppliers, customers and other relevant stakeholders both contribute and receive benefits from a firm (Turnball, 1997). On the other hand, the advocates of resource-based theory suggest corporate performance is a function of the effective and efficient use of the respective tangible and intangible assets of the firm (Reed, 2000). Further, value-added performance (also called wealth creation) is considered the appropriate means of conceptualizing corporate performance, rather than the mere financial returns to a firm’s owners. Sveiby (1998), for example, states “value-added measure exemplifies the correct measure for the production ability of a knowledge economy and the shortfall of traditional financial measures.”

Under enterprise theory, income is the reward that stakeholders get for their participation in the company (Morley, 1979). This alternative interpretation of income is termed value-added performance and is specifically defined as the wealth created or distributed by the company through the utilization of its essential productive resources. The traditional measures of deriving corporate performance based on conventional accounting may be unsuitable accounting in the new economic world where competitive advantage is driven by human capital. Use of traditional measures may lead investors and other relevant stakeholders to make inappropriate decisions when allocating scarce resources (Edvinsson, 1997; Stewart, 1997; Pulic, 1998, 2000; Sveiby, 2000, 2001).

Riahi-Belkaoui (2003), has established a positive correlation between human capital and the performance of selected multinational companies of USA. Saudah, Sofia., Mike, and Richard (2005) investigated the impact of the degree and form of human capital on management accounting practices, more specifically, performance measurement and corporate performance. Further study showed the influence of human capital on corporate performance.

Chen et al. (2005) found that human capital had a positive influence on the financial performance. Syed Najibullah (2005) investigated value creation of
human capital and financial performance of 22 listed Bangladesh banks. The results have supported a positive role of human capital in creating corporate value. Goh (2005) conducted the study to measure the foreign and domestic banks’ performance using the value-added intellectual coefficient (VAICTM). He concluded that both commercial and foreign banks have more positive and significant influence by human capital.

Kamath (2007) studied the impact of human capital on physical capital of 98 scheduled commercial banks in India. He used VAICTM and revealed the relationship between human capital and financial performance of both foreign and Indian banks. Richieri (2007) measured human capital efficiency and corporate financial performance as measured by ROA, ROE and ROS of 1000 biggest Brazilian companies. Kamat (2008) argued that, human capital is more important than physical and structural capital. Mohiuddin, Najibullah and Shahid (2006) established that human capital is more important than physical and structural capital among Indian pharmaceutical companies.

Empirical research has revealed that intellectual capital is a key component that enhances corporate performance, and similar findings revealed by Sharabati et al. (2010), show that intellectual capital comprises human capital, structural capital and relational capital. It has significant and positive effects on the corporate performance of Jordan Pharmaceutical industry. In another study, Joshi, Mahesh, Cahill, Daryll., Sidhu and Jasvinder, 2010, examined the relationship between intellectual capital and Australian-owned banks and concluded that human capital has significant and positive effects on banks’ performance. Mohiuddin, Najibullah and Shahid (2006) conducted a study on 96 companies listed on Athens Stock Exchange and found that human capital had significant effects on the financial performance of companies. Many researchers, academicians, professionals recognize that intellectual capital is being used for value creation and the same argument was explored by Pulic (2001). The studies reviewed above clearly established the usefulness of human capital and this motivated the researchers to undertake an empirical study on the impact of human capital on the corporate financial performance in the Indian Context.

This research explored the relationship between human capital accounting and the valued-added contribution of the Port by analyzing the association between a relevant measure of human capital and various heads of valued-added contribution of the Port. The major components of total value additions of Visakhapatnam Port Trust are – Cargo handling, Port Dock Charges, Railway Earnings, Estate Rentals and Finance and Miscellaneous receipts. Although human Capital valuation has important implications on external financial reporting, measurement and disclosure of human capital are still at infant stage in India. In the contemporary economic environment, valuing human resource
has even greater significance as a powerful managerial tool maximization of overall performance of the organization.

In the light of the above importance, the present research was designed primarily to measure human capital and value-added contribution of the Port for a period of 10 years. The Modified Lev and Schwartz model measured human capital and the Serge Evraet model measured value-added performance of the Port. Data for the period 1998-99 to 2007-2008 were collected from different sources of the Port for this study. Simple correlation and regression techniques were applied to test the relationship between human capital and valued-added performance of the Port.

**Methodology**

*Development of the Hypotheses*

Available literature shows that firms may gain competitive advantage and superior financial performance through the acquisition, holding and subsequent use of strategic assets (Lev, 1987). Both tangible and intangible assets are perceived as potential strategic assets (Riahi and Belkaoui, 2003). Among the invisible assets, human capital is generally considered to be a vital strategic asset. Human capital refers to the specific and valuable knowledge that belongs to the organization. This qualification of human capital as strategic assets rests on a potential link between human capital on the one hand and the firms’ performance on the other (Seethamraju, 2000).

According to Patton (2007), the productivity of a firm lies more on its human capital and system capabilities than its hard assets. Based on these studies, it is established that a firm with higher human capital performance is expected to have a higher rate of productivity and growth in revenue. Accordingly, the researchers predicted a positive relationship between financial performance as measured by profitability, productivity and growth in revenue and the human capital performance. Based on the above empirical conclusions, this research formulated several hypotheses which are:

H₁: There is a positive relation between a firm's human capital and the firm’s gross value added performance.

H₂: There is a positive relation between a firm’s human capital and the firm’s net value added performance.

H₃: There is a positive relation between age of human capital and the firm’s value added performance.

H₄: There is a positive relation between class/designation of human capital and the firm’s value added performance.
Objectives of the Study

The modern accounting function is growing International Financial Reporting Standards (IFRS) are further evolving in this direction and are supported by national statutory bodies like Institute of Chartered Accountants of India (ICAI) and Accounting Standard Board (ASB) in favor of introducing human capital accounting and adopting value added accounting as another method of performance appraisal. To establish the relationship between human capital accounting and valued added performance, this study has the following objectives:

i. to measure human capital and value-added performance of the Port for 10 years.
ii. to establish the relationship between human capital and value-added performance
iii. to traditionalize human capital accounting and value-added accounting in the organization, and
iv. to familiarize the need for human capital accounting and practice of value-added accounting within the Indian Industry.

Models for Human Capital Valuation

Many models have been created to value human capital. Some are based on input measures like salary paid and training expenses, and others on output measures like productivity and efficiency. Some are based on historical costs while some are based on future earnings. There are also models based on opportunity costs and employees' behavior. Each has its limitations, and no model has proved to be more valid than another, although the Lev and Schwartz model has been the most widely-used model for reasons of ease of use and convenience.

Modified Lev and Schwartz Model

The author applied the Modified Lev and Schwartz Model developed by IIM Bangalore, a variation that attempts to go beyond its limitations, for valuing human resource of Visakhapatnam Port Trust. The Modified Lev and Schwartz Model (henceforth MLS) is essentially an input measure and uses the salary paid as well as the expected growth in salary, the training expenses as well as possible increase in the same to value human capital.

The model works as follows:

- The workforce is classified into age groups. The less the range between the upper and lower ranges, the greater the accuracy.
- The various designations (henceforth levels) in each age group are spelt out.
(Employees are classified into four grades in the Port. There are four Class I (top level employees and heads of different departments), Class II (Middle level employees are included like Assistant/deputy heads of the departments), Class III (all supervisory employees are included) and Class IV (all operational employees are grouped in this grade).

- The average salary of the employee of each level in a particular age group is found. Salary includes bonus, dearness allowance, housing and all costs to the company.
- The expected growth rate “g” in salary of employees is calculated.
- The cost of capital “r” of the company is calculated.
- The NPV of salary paid to employees of that particular age group is found as follows:
  - The NPV of the costs to company for a particular level is found by discounting the salary using the annuity growth model.

\[
S = S_n = a \left( \frac{1}{(1-r)} \right) \times \left[ 1 - \frac{(1+g)^{n-a}}{(1+r)^{n}} \right]
\]  

(1)

I is the current annual earnings of employees

r is the discount rate specific to the cost of capital to the company.

g is the growth rate in the annual earnings of the employees.

a is the present age of the employee

t is the retirement age.

- The NPV of the costs to Port for that level in that particular age group is calculated by multiplying S with number of employees in that level in that particular age group.

\[
L_n = S_n \times N_n
\]

- The NPV of the cost of capital for the age group is obtained by adding the NPV of the cost to the Port for all level in that particular age group.

\[
H = \sum_{T}^{L} L + L + L + \ldots \ldots L_n
\]

- Find Out Net Present Value of salary paid to all age groups, let us say H, H and add H+H+H

- Find out the NPV of training expenses for all employees of the organization. Discount using the perpetuity formula to find out the NPV of the cost to the company regarding the training.

\[
H = \sum_{T}^{L} L + L + L + L + \ldots \ldots L_n
\]
Find out net present value of salary paid to all age groups, let us say H, H, H 

\[ \ldots \ldots + H_n \] and add \( H + H + H \ldots H_n \) to get the NPV of salary paid to employees 
of the entire organization and human capital value is \( H = H + H \ldots H_n \)
\[ N = \text{Length of the service} \]

The human capital valuation for Visakhapatnam Port was carried out based on 
equation 1. The process of valuation is described below:

Step 1: Details of employees in different levels and different age groups (primarily 
data supplied by the organization) were obtained. The range of salaries was 
provided by the organization for the purpose of valuation. An assumption was 
made on the growth rate in salary based on inflation figures.

Step 2: The cost of capital was 16 per cent. The cost of capital was approximated 
from the rate of return in the industry. (Since it is a government owned 
organization, the cost of capital is determined by the Government based on the 
average cost of capital of all government-owned major Port trusts. Hence it is 
acceptable to use industry cost of capital and more or less the cost of capital of 
the Port is equal to 16 percent only)

Step 3: Retirement age of employees is 60 years (Present retirement age is 60 
years at the Port. It is the same for all Government-owned Port trusts in India)

Step 4: The net present value of future income by the average employees in 
each level and age group was calculated based on the growing annuity formula 
explained year wise.

Step 5: Calculation of Human Capital

**Value Added Accounting Model**

Value added may be classified into two categories:

a. Gross value added (GVA) which refers to sales plus income from other 
services less bought in materials and services, purchased from outsiders; 
and

b. Net value added (NVA) which refers to the difference between GVA and 
depreciation. In other words, NVA is the sum of the value added to employees, 
to providers of loan capital, government and to the owners.

Different methods of calculation and representation are among the factors that 
restrain the growth and application of alternative performance reporting by the 
orrganization. The Accounting Standards Steering Committee (ASSC) in 1975 
advised that a minimum of eight items are to be included in a statement to consider 
it a value added statement: sales (S), bought in material (B), depreciation (DP), 
dividend (D), interest (I), salaries and wages (W), taxation (T) and retained
earnings (R). Hence, value added is S-B. Distribution of value added is: Dep + W + I + T + Div + R. The rationale behind is to consider the incremental value created by the organization over and above goods and services received from outside.

This study used the following model of value-added accounting developed and adopted by Serge Evraet and Ahmed Riahi Belkaoui. They applied this model to find out value added reporting of US firms in 1998. The authors also applied the same equation in calculating value-added performance of Visakhapatnam Port Trust for a period of 10 years, which is given below. The reason for choosing the above period of 10 years is that the Government of India initiated a step to privatize selected Port trusts in 2001. There was a great pressure on all Port trusts to achieve the targets set by the Government every year which resulted in achieving more revenue. On the other hand, the State Government proposed a joint venture ports near Visakhapatnam Port Trust, namely Gangavaram Port trust (15 km away) and Kakinada Port which is 150 km away from Visakhapatnam Port Trust. Visakhapatnam Port Trust had stiff competition from new private ports also during this period. To remain competitive, Visakhapatnam Port Trust outlined huge capital outlay for the renovation of berths and for construction of new berths for different cargo handling during this period. All together the above ten-year period was challenging to the Port. Measuring value-added contribution throughout the above period was highly essential from both the Port and Government’s point of view. Due to the American and Asian financial crises, traffic of cargo ships was adversely affected too during this period.

\[ S-B=W+I+DP+D+T+R \]  \hspace{2cm} (2)

Or

\[ S-B-\text{DP}=W+I+D+T+R \]  \hspace{2cm} (3)

where:

S = Sales Revenue
B = Bought in material and services
DP = Depreciation
W = Wages
I = Interest
D = Dividends, and
T = Taxes
R = Retained Earnings
Equation (2) expresses the **gross value added**, while equation (3) expresses the **net value added**. In both equations, the left side (the "subtractive side") shows the value added (gross or net), and the right side (the "additive side") shows how value added is divided among the stakeholders. Given the lack of mandated uniform guidelines, variations in the treatment of some items do however exist (Rutherford, 1972, 1980, 1983).

### Measurement of Dependent and Independent Variables

For the purpose of measuring dependent variables, in the present study, two dependent variables were taken into account, namely gross value-added contribution and net value-added contribution. In the case of measuring independent variables, the following three variables, namely age, designation and pay of all employees were considered. Presently, there is no specific theoretical perspective or adequate empirical evidence that supports the superiority of any specific proxy measure over the others. It was, therefore, decided that for the purposes of the present study, the commonly used proxy measures would be applied. Consequently, the measures for each independent variable are explained as:

i. **Age**: Age of the employees has a direct bearing on commitment levels towards their jobs and is the most important factor affecting a firm's financial performance. With passage of work experience, the wastage in terms of time and effort will be low and the effectiveness of the employee increases. With the same human resource, existence and higher efforts will lead to the increase in the financial performance of the firm.

ii. **Designation**: As the employees move vertically up in the hierarchy, the responsibilities, esteem and commitment towards higher job satisfaction may lead to higher performance and better quality of work life. It directly influences the achievement of organizational goals and targets. It further leads to the enhancement of the financial performance of the firm.

iii. **Pay**: better pay system of the firm leads to higher motivation and the ability to retain the experienced personnel. The expertise of the personnel will enhance the productivity levels of the system and channelize all efforts to enhance financial performance of the firm.

### Results and Discussion

Results from the present study are of interest to numerous parties such as Port Authorities, employees, trade unions, banks, institutional investors, the government, scholars and policymakers. Port authorities and employees may find the results useful for understanding the significance of human capital and
as well influence of human capital on the Port’s performance i.e. value-added contribution of the Port.

We arrived at year wise human capital value of the Port during the study period shown in the Table 1. Similarly, both gross and net value-added performance of the Port were also calculated through the equations 2 and 3 during the study period (Table 2). Table 1 demonstrates the total human capital value of Visakhapatnam Port Trust during the study period. The total value of human capital during the study period was Rs. 1145186790690.00. It shows the strength of the employees in terms of monetary value. It is also clear that the value of human capital increased

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Amount in Rupees</th>
<th>Year Wise Change</th>
<th>5 year Wise % change</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1998-99</td>
<td>6142184976.00</td>
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<td>-</td>
</tr>
<tr>
<td>2</td>
<td>1999-2000</td>
<td>6664923552.00</td>
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<td>3</td>
<td>2000-01</td>
<td>7321684814.00</td>
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<tr>
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<td>2001-02</td>
<td>264554372319.00</td>
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<table>
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<th>Gross Value Added in Rs.</th>
<th>Year Wise % Change</th>
<th>5 year Wise % change</th>
<th>Net Value Added in Rs.</th>
<th>Year Wise % Change</th>
<th>5 year Wise % change</th>
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gradually over the years from the years 1998-99. It was high in the years, 2001-02, which constituted 23.10 per cent of the total value of human resource in the study period followed by the years 2004-05, which accounted for 17.13 per cent. The years 1999-2000 and 2000-01 registered 13.87 and 4.71 respectively. The last two years together constituted 22.14 per cent of the total human capital value of the Port. The values of human resources were calculated based on 12 months’ total earnings of the employees of all classes together. Earnings were considered from April to March of every year.

On the other hand, year wise percentage increase and decrease in the values of human resources were calculated for comparison between the two periods. It is clear that the first three years registered a marginal increase in the value of human resources of the Port, followed by a dramatic increase in the fourth year. The years 2005-2006 witnessed a noticeable decrease in human capital value due to the drastic decrease in the work force. The Port implemented Voluntary Retirement Scheme during those years. The table below also shows that there was a remarkable increase in the years 2001-2002 as the Port implemented new pay scales. Similarly, the five-year wise percentage change in the human resource was calculated, highlighting the remarkable increase in the value of human resources.

Value-added accounting statements were prepared from the data collected from different sources of the Port. It was obvious that during the study period, the major components of total value additions of Visakhapatnam Port Trust were – Cargo handling, Port Dock Charges, Railway Earnings, Estate Rentals and Finance and Miscellaneous receipts. Out of the total valued-added creation, cargo handling and dock charges accounted for more than 70 per cent, and the remaining 30 per cent came from earnings like railway and financial receipts. It is understood that the major chunk of valued-added contribution was generated from the main activity of the Port. A critical analysis of the value-added statements showed that, throughout the study period, Visakhapatnam Port Trust had remarkable value-added contributions in all the years. Total gross value-added contributions during the study period totalled Rs. 3291,84,40,406.00 crores whereas net gross value added was Rs. 3101,66,01,237 crores. Out of the 10-year period, the years 2000-01 recorded the highest amount of value-added contributions followed by the years 2003-04.

To find out the relationship between human capital and value-added contributions, regression technique was applied and results were obtained. The correlation between total human capital value of the port and gross value added performance showed only 41 per cent, likewise the correlation between human capital and net value-added contributions showed 42 per cent.
To find out the influence of human capital on both gross value-added and net value-added performance, the correlation matrix was constructed. The results revealed that the influence of human capital on both gross and net value-added contribution was 42 percent. These findings supported the hypothesis that human capital and the firm’s performance are positively correlated. It is understood that value-added performance was influenced by the human capital by more than one third (Table 3) of its total contributions.

Table 3: Correlation between HC and Both Gross Value and Net Value Added Performance

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Correlation between Total HC value and Gross Value added</th>
<th>Correlation between Total HC value and Net Value added</th>
<th>Correlation between Total HC with both Gross and Net value added combined</th>
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<td>Multiple R</td>
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<td>0.42</td>
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<tr>
<td>2</td>
<td>R Square</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>3</td>
<td>Adjusted R²</td>
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<td>0.07</td>
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<tr>
<td>4</td>
<td>t-test</td>
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<tr>
<td>5</td>
<td>P value</td>
<td>0.80</td>
<td>0.79</td>
</tr>
<tr>
<td>6</td>
<td>Significance at 5% level</td>
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<td>0.22</td>
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</tbody>
</table>

To establish age wise influence of human capital on the total value-added performance, all employees of the Port were divided into three groups, viz. between 20-40 years old, between 41-50 years old and employees above 51 years old. Accordingly, age wise human capital values were derived. Remarkably, the age group of 20-40 had the highest value of human capital followed by age group of 51-60. Further analysis showed that employees in the 20-40 years old group accounted for a higher value of human capital. Even in the age group of 51-60, their value was high due to their service and expertise. From the years 2002-2003 onwards, the human capital value of all ages of employees fell drastically due the organization’s voluntary retirement scheme. More employees opted for voluntary retirement and left the organization resulting into decrease in the value of human capital, comparatively. The age group of 41-50 also showed high human capital value although there was a slight fall in the years 2005-2006 (Table 4).

The correlation matrix was constructed to establish the influence of age wise human capital on value-added performance of the organization. Surprisingly, the human capital of the age group of 41-50 had greater impact on both gross and net value added performance with the figures of 76 and 82 per cent respectively. Similarly, the age group of 51-60 also had a remarkable influence on value added contribution of the Port, with an average of 50 per cent on both gross and net value-added performance of the organization. The young employees with the
Table 4: Age Wise Human Capital Value of the Employees

<table>
<thead>
<tr>
<th>Year</th>
<th>Age 20-40 Intellectual Capital Value Rs.</th>
<th>% change</th>
<th>Age 41-50 Intellectual Capital Value Rs.</th>
<th>% change</th>
<th>Age 51-60 Intellectual Capital Value Rs.</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-99</td>
<td>5577087869</td>
<td>7.47</td>
<td>179984328</td>
<td>10.0</td>
<td>385112777</td>
<td>11.8</td>
</tr>
<tr>
<td>1999-00</td>
<td>6027956399</td>
<td>8.6</td>
<td>200238564</td>
<td>10.7</td>
<td>436728587</td>
<td>11.8</td>
</tr>
<tr>
<td>2000-01</td>
<td>6595179745</td>
<td>9.4</td>
<td>224267192</td>
<td>10.7</td>
<td>502237875</td>
<td>13.0</td>
</tr>
<tr>
<td>2001-02</td>
<td>15264490284</td>
<td>-69.94</td>
<td>3285795417</td>
<td>93.2</td>
<td>1853859020</td>
<td>72.9</td>
</tr>
<tr>
<td>2002-03</td>
<td>161306824364</td>
<td>5.37</td>
<td>4513587671</td>
<td>10.8</td>
<td>2603511451</td>
<td>18.0</td>
</tr>
<tr>
<td>2003-04</td>
<td>18839486229</td>
<td>14.37</td>
<td>5185446869</td>
<td>13.0</td>
<td>2703511451</td>
<td>3.7</td>
</tr>
<tr>
<td>2004-05</td>
<td>75278232877</td>
<td>-150.26</td>
<td>5376603313</td>
<td>3.6</td>
<td>2943015284</td>
<td>8.1</td>
</tr>
<tr>
<td>2005-06</td>
<td>10331074931</td>
<td>27.13</td>
<td>6149267460</td>
<td>12.6</td>
<td>11440424789</td>
<td>74.3</td>
</tr>
<tr>
<td>2006-07</td>
<td>11185831281</td>
<td>7.64</td>
<td>7071657579</td>
<td>13.0</td>
<td>13665402349</td>
<td>16.3</td>
</tr>
<tr>
<td>Total</td>
<td>1070408370761</td>
<td>36211064668</td>
<td></td>
<td>38567315240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

highest human capital also made up one third of the figures on the value-added performance of the Port. It is concluded from the study that age wise human capital of the Port has significant influence on generation of value added during the study period (Table 5).

Table 5: Correlation Matrix between Age Wise Human Capital and Value Added Performance

<table>
<thead>
<tr>
<th></th>
<th>20-40</th>
<th>41-50</th>
<th>51-60</th>
<th>Gross</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>0.565983</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>0.145154</td>
<td>0.761635</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross</td>
<td>0.373634</td>
<td>0.827418</td>
<td>0.527593</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Net</td>
<td>0.38289</td>
<td>0.79447</td>
<td>0.481776</td>
<td>0.996461</td>
<td>1</td>
</tr>
</tbody>
</table>

It is also believed that human capital of the employees in different classes/grades may also influence the value-added performance of the organization and the authors made an attempt to establish this influence. Human capital of the organization was calculated for all four classes of the employees, as shown in Table 6. Grade I employees had the highest value of human capital followed by Class/Grade II employees. The reasons for higher values are their expertise and number of years of service put in.

Similarly, the correlation matrix was constructed to test the influence of class/grade of employees on the both gross and net value-added performance of the Port. Class IV employees of the Port had the highest influence on the value-
Table 6: Class wise human capital of the employees

<table>
<thead>
<tr>
<th>Year</th>
<th>Class IV Intellectual Capital Value Rs.</th>
<th>Class III Intellectual Capital Value Rs.</th>
<th>Class II Intellectual Capital Value Rs.</th>
<th>Class I Intellectual Capital Value Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-99</td>
<td>157,89,54,890</td>
<td>325,65,11,256</td>
<td>20,00,56,652</td>
<td>110,66,62,178</td>
</tr>
<tr>
<td>2000-01</td>
<td>148,32,02,359</td>
<td>125,45,39,371</td>
<td>348,60,67,667</td>
<td>109,78,75,417</td>
</tr>
<tr>
<td>2001-02</td>
<td>27,00,01,468</td>
<td>475,98,63,596</td>
<td>804,56,59,013</td>
<td>251,88,08,243</td>
</tr>
<tr>
<td>2002-03</td>
<td>5064,11,53,647</td>
<td>2336,92,24,232</td>
<td>6116,41,99,189</td>
<td>2362,78,21,148</td>
</tr>
<tr>
<td>2003-04</td>
<td>4786,50,32,596</td>
<td>3788,86,52,753</td>
<td>2302,29,72,938</td>
<td>5964,72,65,200</td>
</tr>
<tr>
<td>2004-05</td>
<td>5366,87,14,498</td>
<td>2742,62,55,664</td>
<td>7182,70,05,706</td>
<td>4326,18,28,680</td>
</tr>
<tr>
<td>2005-06</td>
<td>5508,25,33,131</td>
<td>1634,80,68,037</td>
<td>430,24,68,319</td>
<td>786,47,87,897</td>
</tr>
<tr>
<td>2006-07</td>
<td>190,75,05,797</td>
<td>1332,93,33,450</td>
<td>3541,04,22,541</td>
<td>7025,29,98,394</td>
</tr>
<tr>
<td>2007-08</td>
<td>2037,38,38,848</td>
<td>1444,42,39,684</td>
<td>3826,55,68,867</td>
<td>5951,17,33,811</td>
</tr>
</tbody>
</table>

added performance of the Port (56%) followed by class III employees with the influence of 55 per cent on gross value-added contribution and 53 per cent on net value-added performance respectively. On the other hand class II employees had significant influence on the total value-added performance with an average of 38 per cent. Class I employees’ influence on the total value-added performance was negligible even though they had the highest value of human capital (Table 7).

Table 7: Correlation Matrix between Class/Grade Wise Human Capital and Value Added Performance

<table>
<thead>
<tr>
<th>Class IV</th>
<th>Class III</th>
<th>Class II</th>
<th>Class I</th>
<th>Gross</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class IV</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class III</td>
<td>0.8350134</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class II</td>
<td>0.56928502</td>
<td>0.6373451</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class I</td>
<td>-0.2297264</td>
<td>-0.0588614</td>
<td>0.00034255</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gross</td>
<td>0.5670914</td>
<td>0.5506096</td>
<td>0.39730150</td>
<td>0.0722795</td>
<td>1</td>
</tr>
<tr>
<td>Net</td>
<td>0.5664338</td>
<td>0.53978775</td>
<td>0.38689933</td>
<td>0.0844303</td>
<td>0.99646107</td>
</tr>
</tbody>
</table>

Conclusion and Recommendations

Intellectual Capital Accounting has been receiving much attention in the past three decades, because there is a genuine need to arrive at the value of the human resource at each organization, which can be used for improving and evaluating not only the performance of human resource but also to assess their influence on the financial performance of the organization. The traditional framework of accounting is in the process of being expanded to include a much broader set of measurement than was thought possible or desirable in the past.
The main objective of this research was to establish the extent of the influence of human capital on total value-added performance of Visakhapatnam Port Trust (VPT), a major port in India. Our results showed statistically the influence of different classes and grades of human capital on both gross and net value-added performance of the Port during the study period of 10 years. The result obtained statistically showed that the human capital of the Port had significant influence on the value-added performance of the Port (42 per cent).

Similarly, age wise and grade/class wise human capital values were arrived at and correlated with both gross and net value added performance of the Port. The age group between 41-50 showed the highest correlation with both gross and net value added performance of the Port (82 and 79 per cent) whereas in the case of class/grade of employees influencing value added performance, results showed that classes IV and III had positive correlation with value added performance in the range of 53 to 56 percent.

This study has also attempted to contribute to the significance of measurement of the human capital as well as value-added performance measurement strategies to be initiated by different companies. This study accordingly, provides empirical evidence of the assessment of the relationship between a firm’s human capital and value- added performance of the organization. Further, this study also provides some analytical guidelines to Indian firms towards introducing human capital accounting and value added accounting.

These specific findings, offer new insight into exploring the relationship between a firm’s value-added performance and human capital of the firm. The study has arrived at the concrete conclusion of explaining how age and designation of the Port employees are influencing the value-added performance. The results are satisfactory and provide greater scope for further research in this direction.

Intellectual capital is an important facet of the overall performance of any organization. Companies with strong human capital may be able to influence higher value of value added performance. Even human capital of an individual also can make a difference in the total value-added performance of an organization as seen from the findings of the study. It is further concluded from the results that the influence of human capital is highly established. Intellectual capital accounting and value added accounting are new concepts, even though Visakhapatnam Port Trust has been in operation since 1933. No systemic efforts has been made by Visakhapatnam Port Trust in introducing human capital accounting and measuring value added performance. The results from the study may influence the Port Authorities to prepare the organization to introduce valuing human capital as well as measurement of value-added performance as the findings showed the positive influence of human capital on value-added performance of the Port. In
addition, to achieve overall turnaround performance of the Port, it is important that the Port authorities consider the significance of human capital as a vital asset of this organization to achieve its goals and objectives and to perform better than competing private ports, both locally and globally.

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