ICT  Force Towards The Indian I.T. Software Entrepreneurship

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Abstract  
This paper aims to explore the role and impact of Information on Communication Technologies towards the Indian I.T. Software Industrial sector. It surveys to examine the factors influencing the Indian I.T. Software Entrepreneurship. It searches for indicators effecting the professional environment and investigates if the Indian I.T. Software Entrepreneurs or Organizations are successful in achievement of a good Professional Development. Throughout the study, only Primary data is used. Structured Questionnaire Module is set. Cluster sampling and Random sampling is used. Sampling frame is South India. Data collection methods are: Mails, Interviews and Schedules. Source list comprises of important Indian Software Entrepreneurs/Organization. A Pilot Testing is undertaken. To meet objectives, hypothesis test is applied. For statistical analysis, multivariate regression, Analysis of Variance and Factor Analysis is used. Test Statistics $F$, $t$ is also used. For coding and computations, a suitable statistical software and Microsoft Office Excel along with embedded Q1Macros 2012 is used. Key Words: Information on Communication Technologies, Indian, IT, Software, Factors, Industry, indicators, achievements, Entrepreneurship, Sector.

1. Introduction to ICT and objectives of this paper

1.1. Familiarity with ICT  
ICT or Information on Communication Technologies has become an essential tool for the technical, economic, or social improvement of any country in the modern world today. Hence, it is embraced by all developing countries. Today, ICT related area is one of the most leading area of research. It can be viewed as an integrated term. It is also considered as an interdisciplinary area of research. India has also embraced ICT for its economic, social and technical growth. ICT buzz includes, ICT towards education, ICT towards Women empowerment, ICT for Child Development, ICT towards Health and Pharmacy, ICT towards libraries, poverty eradication, rural development, agriculture, industrial promotion, unemployment and ICT towards Software Industries. ICT tools have shown its increasing impulse as a global force. Above all, it is equally important how a country frames the policies and strategies and how it implements ICT Tools for its own benefit.

1.2. Objectives of research

1.2.1. Objective A. To study the Impact, importance and achievement of ICT towards the Indian IT Industry, particularly the Software Entrepreneurship, by focusing towards Professional development.

1.2.2. Objective B. To point out that knowledge is a factor of production and reveal that knowledge in the field of I.T. had developed the concept of Entrepreneurship.
2. Review of literature

2.1. Proximities and innovation evidence from Indian Information Technology industry in Bangalore

The paper by Florian Arun Taeube [1] has a hypothesis that some Indian regions are more apt to economic development and innovation due to their higher affinity to education and learning as well as their more general openness.

2.2 Software industry and India's economic development


2.3. Assessing Software reuse in Indian Information Technology companies: A structural equation modelling approach

The paper by Padmanav Chary and Biswajit Mahanty [3] discusses on access to software reuse in Indian technology firms. Software reuse generates a lot of interest amongst the cross-section of people in the industry. The article [4] reviews the present status of software reuse practices in the Indian information technology firms.

2.4. Role of NASSCOM

NASSCOM under the aegis of Ministry of Commerce, Government of India had initiated a Project called NASSCOM's India-Europe Software Alliance (NIESA).

2.5 Performance, challenges and opportunities of Indian software export

India has emerged as an ‘IT Super power’, especially in the field of software and related services export. The paper [5] by Asheref Illiyan throws light on this.

3. Materials and methods

3.1. Types of data

3.1.1. Primary Data. Our main study is based only on the primary data.[6]

A Pilot Testing of the Questionnaire was conducted and there after, the required changes were made in the questionnaire.

3.1.2. Secondary Data. This is collected through articles, research papers, journals, Indian e-Readiness Assessment reports, Reports from Indian Government Departments and Centres [7],[8],[9],[10],[11],[12], Software Technology Parks of India [13], News [14], NASSCOM publications [15].

<table>
<thead>
<tr>
<th>Table 1. Details of primary data collection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MODULE 1</strong></td>
</tr>
<tr>
<td>Data collection Methods</td>
</tr>
<tr>
<td>Sample size</td>
</tr>
<tr>
<td>Sampling technique</td>
</tr>
<tr>
<td>Type of universe</td>
</tr>
<tr>
<td>Sampling design</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Sampling unit</td>
</tr>
<tr>
<td>Source list</td>
</tr>
</tbody>
</table>

3.2. Methods/tools used

The following other statistical tools are used and multivariate analysis is also done.

- Mean, Mode, Standard deviation,
variance, covariance and correlation are used as tools for statistical measures.

- ANOVA
- Factor Analysis (Principle Component method is used to extract factors of interest)
- Latin Square design is used to compute Covariance matrix/Correlation matrix.
- Multivariate Regression
- Hypothesis Testing is set to meet the objectives of the research study
- For further hypothesis testing we use F statistic and/or t statistic.

3.3. Other materials used

SPSS and Excel is used. Q1 Macros 2012 incorporated/embedded with Microsoft Works (Excel) has also been used for further analysis and computations.

4. Coding, observations, results and discussion

4.1. Coding to compute important statistical measures of variables

The Data Base File is Processed in SPSS. Computations have been done using both SPSS and Q1 Macros 2012.

4.1.1. SPSS syntax and Output to generate the various statistical measures.

### Table 2. SPSS coding notes

<table>
<thead>
<tr>
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<th>03-Dec-2012 11:03:38</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
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<td>C:\Users\baby\Documents\RANKA1_NUMRC.SAV_1.sav</td>
</tr>
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<td>Active Dataset</td>
<td>DataSet1</td>
</tr>
<tr>
<td>Filter</td>
<td>&lt;none&gt;</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;none&gt;</td>
</tr>
<tr>
<td>Split File</td>
<td>&lt;none&gt;</td>
</tr>
</tbody>
</table>

### Table 3. Statistics of the various factors

<table>
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<tr>
<th>Variable</th>
<th>Valid</th>
<th>Mean</th>
<th>Std. Error of Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Std. Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
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<td>60</td>
<td>6.0</td>
<td>0.26</td>
<td>6.0</td>
<td>4</td>
<td>2.083</td>
<td>4.339</td>
</tr>
<tr>
<td>X10</td>
<td>60</td>
<td>8.8</td>
<td>0.23</td>
<td>10.0</td>
<td>10</td>
<td>1.811</td>
<td>3.281</td>
</tr>
<tr>
<td>X11</td>
<td>60</td>
<td>9.6</td>
<td>0.12</td>
<td>10.0</td>
<td>10</td>
<td>0.936</td>
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</tr>
<tr>
<td>X12</td>
<td>60</td>
<td>8.0</td>
<td>0.22</td>
<td>8.00</td>
<td>8</td>
<td>1.745</td>
<td>3.046</td>
</tr>
<tr>
<td>X14</td>
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<td>0.05</td>
<td>10.0</td>
<td>10</td>
<td>0.446</td>
<td>0.199</td>
</tr>
<tr>
<td>X15</td>
<td>60</td>
<td>9.6</td>
<td>0.12</td>
<td>10.0</td>
<td>10</td>
<td>0.951</td>
<td>0.904</td>
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</table>

### Table 4. Rank wise satisfaction of variables

<table>
<thead>
<tr>
<th>RANK</th>
<th>X9</th>
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<th>X11</th>
<th>X12</th>
<th>X14</th>
<th>X15</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
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<tr>
<td>6</td>
<td>8</td>
<td>8</td>
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<td>8</td>
<td>0</td>
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</tr>
<tr>
<td>7</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
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<td>0</td>
<td>4</td>
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<td>10</td>
<td>0</td>
<td>32</td>
<td>37</td>
<td>16</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

4.2. Observations

Frequencies of Rank wise Salary Satisfaction of the variables
Let the variable $X_9 = \text{RANK WISE SALARY SATISFACTION}$. The higher the rank the more the salary satisfaction. It has found that no respondents contribute for ranks less than 4. That is 40% of the respondents have 40% of salary satisfaction. Only 20% of respondents have 80% salary satisfaction.

![Figure 1. Graph of salary satisfaction](image)

Let the variable $X_{10} = \text{RANK WISE LEISURE SATISFACTION}$. It has found that no respondents contribute for rank less than 5. 53.3% of the respondents seem to have full 100% leisure satisfaction.

![Figure 2. Graph of leisure satisfaction](image)

Let $X_{11} = \text{Relationship with colleagues}$. 62% of the respondents seem to have 100% satisfaction with their colleagues relationship.

Let the variable $X_{12} = \text{RELATIONSHIP WITH BOSS}$. It has found that no respondents contribute for ranks less than 4. Only 26.7% of the respondents are fully satisfied with their relationship with Boss. Again 26.7% of them have 80% satisfaction with their Boss relationship.

![Figure 3. Relationship with colleagues](image)

Let the variable $X_{14} = \text{TEAM CO-ORDINATION}$. It has found that no respondents contribute for ranks less than 7. 73.3% of the respondents are fully satisfied (100%) with their Team Co-ordination.

![Figure 4. Graph of relationship with boss](image)

![Figure 5. Graph of team co-ordination](image)
Let the variable \(X_{15}\) = the factor \textit{PROFESSIONAL ENVIRONMENT}.

It has found that 73.3% of respondents report 100% satisfaction with their Professional Environment.

![Graph of professional environment](image)

**Figure 6. Graph of professional environment**

5. Meeting the objectives

5.1. Objective A

To study the Impact, importance and achievement of ICT towards the Indian IT Industry, particularly the Software Entrepreneurship.

To meet this objective, we shall implement Test 1 comprising the testing of a set hypothesis.

5.1.1. Test 1. To meet this objective, we shall study the impact of ICT towards the Professional Development of the Indian IT Software Entrepreneurs. Hence we set the testing hypothesis as follows:

\[ H_0: \text{Indian IT Software Entrepreneurs are unsuccessful or lack behind to show the positive impact of ICT achievements towards the Professional Development of their Organization.} \]

The following steps are involved:

- To compute the rank wise correlation between the variables.
- To determine the covariance matrix.
- To perform ANOVA
- To use a Test Statistic (F or t statistic)
- To Construct a linear multiple regression Model
- To test the set Hypothesis.
- Results

We construct a regression model with factor \(Y\) = Professional Development as the Dependent variable.

The variable names are as follows: \(X_9\) = Salary satisfaction; \(X_{10}\) = Leisure Satisfaction; \(X_{11}\) = Relationship with Colleagues; \(X_{12}\) = Relationship with Boss; \(X_4\) = Team Co-ordination and \(X_{15}\) = Professional Development.

The following model is regressed using SPSS statistical software. ANOVA and other results are summarized/tabulated.

### Table 5. Covariance matrix for computation of total variance

<table>
<thead>
<tr>
<th></th>
<th>(X_9)</th>
<th>(X_{10})</th>
<th>(X_{11})</th>
<th>(X_{12})</th>
<th>(X_{14})</th>
<th>(X_{15})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X_9)</td>
<td>55.04</td>
<td>-8.96</td>
<td>-21.76</td>
<td>10.24</td>
<td>-23.36</td>
<td>-24.96</td>
</tr>
<tr>
<td>(X_{10})</td>
<td>-8.96</td>
<td>93.44</td>
<td>119.04</td>
<td>39.04</td>
<td>114.24</td>
<td>115.84</td>
</tr>
<tr>
<td>(X_{11})</td>
<td>-21.76</td>
<td>119.04</td>
<td>170.24</td>
<td>37.44</td>
<td>167.04</td>
<td>167.04</td>
</tr>
<tr>
<td>(X_{12})</td>
<td>10.24</td>
<td>39.04</td>
<td>45.44</td>
<td>34.24</td>
<td>31.04</td>
<td>34.24</td>
</tr>
<tr>
<td>(X_{14})</td>
<td>-23.36</td>
<td>114.24</td>
<td>167.04</td>
<td>34.24</td>
<td>167.04</td>
<td>165.44</td>
</tr>
<tr>
<td>(X_{15})</td>
<td>-24.96</td>
<td>115.84</td>
<td>167.04</td>
<td>31.04</td>
<td>165.44</td>
<td>167.04</td>
</tr>
</tbody>
</table>

**SYNTAX:**

```plaintext
DATASET ACTIVATE DataSet1.
CORRELATIONS /VARIABLES=X9 X10 X11 X12 X13 X14 X15 /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE.
REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS CI(95) R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT X15 /METHOD=ENTER X10 X11 X12 X13 X14.
```

### Table 6. Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>(X_9)</th>
<th>(X_{10})</th>
<th>(X_{11})</th>
<th>(X_{12})</th>
<th>(X_{14})</th>
<th>(X_{15})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X_9)</td>
<td>1</td>
<td>.485**</td>
<td>.597**</td>
<td>.584**</td>
<td>.308*</td>
<td>.285*</td>
</tr>
<tr>
<td>(X_{10})</td>
<td>.485*</td>
<td>1</td>
<td>.304*</td>
<td>.487**</td>
<td>.197*</td>
<td>.399**</td>
</tr>
<tr>
<td>(X_{11})</td>
<td>.191</td>
<td>.118</td>
<td>1</td>
<td>.367**</td>
<td>.756**</td>
<td>.629**</td>
</tr>
<tr>
<td>(X_{12})</td>
<td>.597**</td>
<td>.304*</td>
<td>.367**</td>
<td>1</td>
<td>.528**</td>
<td>.626**</td>
</tr>
<tr>
<td>(X_{13})</td>
<td>.584**</td>
<td>.487**</td>
<td>.756**</td>
<td>.528**</td>
<td>1</td>
<td>.586**</td>
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<tr>
<td>(X_{14})</td>
<td>.308*</td>
<td>.197</td>
<td>.629**</td>
<td>.626**</td>
<td>.586**</td>
<td>1</td>
</tr>
<tr>
<td>(X_{15})</td>
<td>.285*</td>
<td>.399**</td>
<td>.663**</td>
<td>.636**</td>
<td>.724**</td>
<td>.815**</td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>60</td>
<td>60</td>
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<td>60</td>
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</tr>
</tbody>
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Regression

Table 7. Regression variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team Co-Ordination, Leisure Satisfaction, Relationship with Colleagues, Relationship with Boss, Relationship with Team Members</td>
<td>.</td>
<td>Enter</td>
</tr>
</tbody>
</table>

a. All requested variables entered.

Table 8. Model summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.884*</td>
<td>.781</td>
<td>.761</td>
<td>.670</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Team Co-Ordination, Leisure Satisfaction, Relationship with Colleagues, Relationship with Boss, Relationship with Team Members

Table 9. Variable coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>.668</td>
<td>2.548</td>
<td>-2.624</td>
</tr>
<tr>
<td>Leisure Satisfaction</td>
<td>.122</td>
<td>.061</td>
<td>.162</td>
</tr>
<tr>
<td>Relationship with Colleagues</td>
<td>.220</td>
<td>.172</td>
<td>.150</td>
</tr>
<tr>
<td>Relationship with Boss</td>
<td>.096</td>
<td>.069</td>
<td>.122</td>
</tr>
<tr>
<td>Relationship with Team Members</td>
<td>.510</td>
<td>.398</td>
<td>.166</td>
</tr>
<tr>
<td>Team Co-Ordination</td>
<td>.742</td>
<td>.141</td>
<td>.515</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Professional Environment

Table 10. ANOVA

<table>
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<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
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<tr>
<td>1 Regression</td>
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<td>5</td>
<td>17.333</td>
<td>38.564</td>
<td>.000*</td>
</tr>
<tr>
<td>Residual</td>
<td>24.270</td>
<td>54</td>
<td>.449</td>
<td>38.564</td>
<td>.000</td>
</tr>
<tr>
<td>Total</td>
<td>110.933</td>
<td>59</td>
<td></td>
<td>38.564</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Team Co-Ordination, Leisure Satisfaction, Relationship with Colleagues, Relationship with Boss, Relationship with Team Members

Using tables, the critical values at 5% confidence level and 1% confidence level of F(5,59) is less when compared to a high computed value of F = 38.564. That is, we reject the null hypothesis.

Result 1 of Test 1. Indian IT Software Entrepreneurs are successful in showing a positive impact of ICT achievements towards the Professional Development of their Organization.

5.2. Objective B

To point out that knowledge is a factor of production and reveal that knowledge in the field of I.T. had developed the concept of Entrepreneurship.

The following two graphs are sufficient enough to prove that knowledge is a factor of production and reveal that knowledge in the field of I.T. had developed the concept of Entrepreneurship.

5.2.1. Purpose of Internet Use
5.2.2. Internet Use Has Made Life Easier

![Internet Use Has Made Life Easier](image)

**Figure 8. Internet use has made life easier**

**Result 2.** A Strong Agreement of the respondents towards the fact that ICT Applications are required for their present job and also that their life has become easier due to these applications further support to meet this objective. Hence we conclude that knowledge is a factor of production and reveal that knowledge in the field of I.T. had developed the concept of Entrepreneurship.

6. Bibliography

[1] Proximities and Innovation: Evidence from Indian IT industry in Bangalore, by Florian Arun Taeube


[9] Reports of Annual Survey of industries for different years DRUID Working Paper No 04-10


[12] Software Technology Parks of India (STPI), Hyderabad

  - Department of Information Technology, Govt. of India
  - Standardisation, Testing & Quality Certification (STQC)
  - MIT Accreditation of Computer Courses (DOEACC)
  - IT & Communication Dept., Govt. of AP, AP Technology Services (APTS), Govt. of AP
  - AP Online, Govt. of Andhra Pradesh Institute of Electronic Governance HITEC City, Hyderabad
  - International Institute of Information Technology (IIIT), Hyderabad
  - Hyderabad Software Exporters Association (HYSEA)

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