FACTORS INFLUENCING KNOWLEDGE SHARING IN SOFTWARE DEVELOPMENT

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STRUCTURE OF PRESENTATION

- Background
- Research question and objective
- Contributions of the research
- Literature review
- Conceptual framework
- Research methodology
- Research results
- Conclusions and recommendations
- Further research possibilities
BACKGROUND

• Organisations are dependent on knowledge to achieve and maintain a competitive advantage.
• Software developing organisations experience unique challenges with the practice of knowledge sharing.
• Despite functioning in a rapidly changing environment, software developers are expected to meet the triple constraint of time, cost and scope.
• There is a scarcity of empirical studies focusing on knowledge sharing in a software development context.
• Knowledge sharing is not understood and factors influencing knowledge sharing are not known and dealt with in software developing organisations.
**RQ:** What factors influence the sharing of useful knowledge?

**RO:** To identify factors influencing the sharing of useful knowledge.
CONTRIBUTIONS OF THE RESEARCH

• This paper investigates factors influencing knowledge sharing in software development projects— and to understand the context of factors.
• Perceived importance of factors influencing knowledge sharing is investigated in three categories namely:
  ➢ Individual factors;
  ➢ Technological factors;
  ➢ Organisational factors.
• The findings of this research are expected to assist in closing the gap that causes IT projects failing to meet the triple constraint of time, cost and scope.
• Furthermore, this research is expected to aid with the understanding of factors influencing knowledge sharing (also referred to as obstacles to knowledge sharing).
• This research is expected to contribute to the body of knowledge on knowledge sharing in software development projects through an empirical study in South African Software developing organisations in the Gauteng area.
## LITERATURE REVIEW: FACTORS INFLUENCING KNOWLEDGE SHARING

**Factors influencing knowledge sharing**


<table>
<thead>
<tr>
<th>Category</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Lack of time, Lack of trust, Low awareness of the value of possessed knowledge, Power relationships, Personal characteristics, Lack of social networks, Language problems</td>
</tr>
<tr>
<td>Organisational</td>
<td>Poor organisational climate and culture, Disintegration of the knowledge sharing purpose from the organisational goals, Neglect of managerial communication about the benefits of knowledge sharing, Distance, Lack of infrastructure to share knowledge, Lack of reward systems, Competitiveness of different units, Complexity of different organisation, Lack of network connections</td>
</tr>
<tr>
<td>Technological</td>
<td>Unsuitable technology, Unrealistic expectations, Reluctance to use the chosen technologies, Lack of training, Lack of communication about the benefits of chosen technologies, Lack of time</td>
</tr>
</tbody>
</table>
# LITERATURE REVIEW: RELATED WORK

<table>
<thead>
<tr>
<th>Reference Source</th>
<th>Research Problem addressed</th>
<th>Research Methodology used</th>
<th>Research Results obtained</th>
<th>Further research problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wee, S.H. 2012. Important enabler in the knowledge sharing process: Top management support.</td>
<td>Relationship between knowledge sharing and the performance of the organisation.</td>
<td>Quantitative research study</td>
<td>Top management support is the greatest obstacle to knowledge sharing.</td>
<td>Other enablers to knowledge sharing in more depth and how they influence organisational performance.</td>
</tr>
</tbody>
</table>
| Keyes, J. 2008. Identifying the barriers to knowledge sharing in Knowledge Intensive organisations. | Organisations do not distribute existing knowledge | Qualitative research methodology | Major factors to knowledge sharing (cultural and organisational). Relationships between willingness to knowledge sharing and effective knowledge sharing | 2 recommendations  
• Qualitative and quantitative analysis.  
• A broader sampling |
| Wiewiora, J., Trigunarsyah, A.B, Murphy, G., Chen, L. 2009. Barriers to effective knowledge transfer in project-based organisations. | Current literature pinpoints factors to knowledge transfer in general but not specifically in project-based organisations where time is a crucial factor. | Qualitative research method. | 1. Obstacles related to lack of social communication.  
2. Obstacles related to transfer of documented lessons learned.  
3. Obstacles related to top management support or in knowledge transfer. | Further study on obstacles relating to other software development projects. |
CONCEPTUAL FRAMEWORK

- Ways of sharing knowledge derived from knowledge sharing retention framework (Willems, 2009:14).
- Factors influencing knowledge sharing categories (Kukko and Helander, 2012:3758-3759).
RESEARCH METHODOLOGY

• Mainly quantitative, with some qualitative components to increase understanding.
• Positivism paradigm followed.
• Four software developing organisations participated in this research study
• Expert sampling employed.
• Participants (ICT experts, e.g. project managers, business analysts, system testers, database administrators and programmers).
• Questionnaires with close-ended questions were distributed online.
• 53.7% of the employees targeted responded to the questionnaires.
• Interviews were conducted to complement quantitative data.
RESEARCH RESULTS
DEMOGRAPHIC PROFILE OF RESPONDENTS

**Gender**
- Male: 66.67%
- Female: 33.33%

**Position/Role**
- Programmer: 24.79%
- Business Analyst: 18.80%
- Project Manager: 8.55%
- Systems Tester: 25.64%
- Database Administrator: 17.09%
- Other: 5.13%

**Experience**
- 1-5 years: 28.21%
- 6-10 years: 34.19%
- 11-20 years: 24.79%
- 21 or more years: 12.82%

**Qualification**
- Matric: 5.98%
- Degree/Diploma: 58.97%
- Post graduate: 34.19%
- Other: 0.85%
# FACTORS INFLUENCING KNOWLEDGE SHARING

<table>
<thead>
<tr>
<th>No</th>
<th>Factor</th>
<th>Strongly Agree (%)</th>
<th>Agree (%)</th>
<th>Undecided (%)</th>
<th>Disagree (%)</th>
<th>Strongly Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JobSecurity</td>
<td>65</td>
<td>21</td>
<td>8</td>
<td>3</td>
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<tr>
<td>2</td>
<td>MotivationalFactors</td>
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<td>8</td>
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<td>3</td>
<td>LackOfTime</td>
<td>56</td>
<td>28</td>
<td>6</td>
<td>7</td>
<td>3</td>
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<td>4</td>
<td>PsychologicalFactors</td>
<td>56</td>
<td>31</td>
<td>5</td>
<td>6</td>
<td>2</td>
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<tr>
<td>5</td>
<td>LackOfCommunication</td>
<td>54</td>
<td>35</td>
<td>3</td>
<td>6</td>
<td>2</td>
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<tr>
<td>6</td>
<td>ResistanceToChange</td>
<td>54</td>
<td>32</td>
<td>6</td>
<td>6</td>
<td>2</td>
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<tr>
<td>7</td>
<td>LackOfRewards</td>
<td>51</td>
<td>34</td>
<td>6</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>UnrealisticExpectation</td>
<td>51</td>
<td>33</td>
<td>5</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Education</td>
<td>50</td>
<td>29</td>
<td>9</td>
<td>9</td>
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<td>10</td>
<td>LackOfTrust</td>
<td>49</td>
<td>32</td>
<td>10</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>LackOfInfrastructure</td>
<td>48</td>
<td>33</td>
<td>7</td>
<td>9</td>
<td>3</td>
</tr>
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<td>12</td>
<td>PowerRelationship</td>
<td>44</td>
<td>39</td>
<td>9</td>
<td>7</td>
<td>1</td>
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<tr>
<td>13</td>
<td>CompetitivenessOfUnits</td>
<td>41</td>
<td>36</td>
<td>15</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>DisIntegrationOfKnowledge</td>
<td>39</td>
<td>38</td>
<td>14</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>PoorOrCulture</td>
<td>38</td>
<td>46</td>
<td>9</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
FACTORS INFLUENCING KNOWLEDGE SHARING CONTINUED…. (ASPECTS ADDED BY INTERVIEWEES)

• Recognition
• Environment
• Selfishness
• Work overload
• Competition
• Discrimination – race, language
FACTORS INFLUENCING KNOWLEDGE SHARING, CONT...
TEST FOR INTERNAL CONSISTENCY

• Descriptive statistics were generated to summarise the data for the factors influencing the sharing of knowledge.

• Factors are measured reliable when the Cronbach’s alpha values are 0.7 or higher (Field, 2005: Chapter 15) and (Kline, 1999: Section 1).

• Cronbach’s alpha values less than 0.7 are questionable, poor or unacceptaable.

• Cut-off point of 0.7 used.

Factors influencing knowledge sharing
(0.9534)

Value suggests that the items have a high (‘good/excellent’) internal consistency
TEST FOR ASSOCIATION

• A P-value helps in determining the significance of the research result.

• Interpretation was performed at 0.05 error rate.

• Pearson’s chi-squared test was used to test for association between any pair of categorical variables.

• A P-value above the cutoff (0.05) is considered not to be significantly associated (Frost, 2004).

• The P-value is a number between 0 and 1 and the cutoff is 0.05 (Frost, 2004).

• Significant differences in views/perceptions of employees in different demographics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1 out of 33</td>
<td>3%</td>
</tr>
<tr>
<td>Years of experience</td>
<td>1 out of 33</td>
<td>3%</td>
</tr>
<tr>
<td>Highest education</td>
<td>23 out of 33</td>
<td>70%</td>
</tr>
<tr>
<td>Position</td>
<td>20 out of 33</td>
<td>61%</td>
</tr>
</tbody>
</table>
CONCLUSIONS AND RECOMMENDATIONS

• Factors influencing knowledge sharing (individual, organisational and technological).

• Client expectations not met due to lack of awareness of these factors.

• Solutions to minimise obstacles to knowledge sharing should be employed.

• The research study and supporting literature suggest that software developing organisations are failing to meet customer’s expectations not because they don’t have the necessary knowledge, skills or expertise but because they are not fully aware of the factors influencing the sharing of useful knowledge.

• Improved understanding of factors influencing knowledge sharing is expected to assist software developing organisations in closing the gap for IT projects failing to meet the triple constraint of time, cost and scope.
FURTHER RESEARCH POSSIBILITIES

• A larger scale study investigating knowledge sharing in software development organisations.

• Investigating the links between knowledge sharing and organisational performance.