The Innovation Value Chain and Organizational Culture

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THE INNOVATION VALUE CHAIN AND ORGANIZATIONAL CULTURE

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ABSTRACT
This paper presents the findings of a study of the relationship between organizational culture and innovation. The particular contribution of this study is mainly its focus on the Innovation Value Chain (thus how organizations generate new ideas, convert them to products or services, and subsequently spread these) and how this might be related to organizational culture. The theoretical basis was therefore the Innovation Value Chain of Hansen and Birkenshaw (2007) and the X Model of Organizational Culture of Smit, Ludik and Forster (2008). Data was collected from more than 400 respondents in 7 organizations in Ireland. The findings reveal that in particular the ability of organizations to convert ideas into new products or services can be explained by variance in the ability of the organization to Strategize, Adapts, Coordinate and Relate to each other (for instance through team work) and that there are moderate to strong relationships between these elements.

Keywords
Organizational Culture, Innovation, Innovation Value Chain, X Model of Organizational Culture

INTRODUCTION
The demand for organizations to innovate is relentless. The rising use of social media, for instance, seems to be permeating personal lives as well as the business environment leading to expectations that organizations exploit its potential (Qualman, 2010). But it seems that organizations are still struggling to innovate. Koetzier and Alon (2013) suggest that this may partly due to a lack of having a well-planned formal system in place for innovation. In addition Büschgens, Bausch and Balkin. (2013) suggest that a developmental organizational culture is essential for innovation success.

This paper reports on a study aimed at investigating the relationship between organizational culture and innovation. The research question is therefore what is the nature of the relationship between innovation and organizational culture. First a brief review of the literature is presented ending with an explanation of the theoretical basis for the empirical phase of the project. This is followed by a description of how the investigation was conducted. The findings are presented and the paper concludes with some suggestions for future research as well as recommendations for practice.

LITERATURE REVIEW
The literature reveals a plethora of publications and investigation of the possible relationship between organizational culture and innovation. See for instance Deal & Kennedy 1982, Kiumarsi, Mohd Isa and Navi (2015), Martins and Terblanche (2003) and Park, Song, Yoon and Kim (2013). The focus of this investigation was more specifically on the Innovation Value Chain (IVC) and its relation to organizational culture.

The idea of IVC was suggested by Hansen and Birkenshaw (2007) with a model which suggests an integrated process of transforming new ideas into commercial outputs. This process contains three phases namely Idea Generation, Idea Conversion and finally Diffusion.

The first phase, Idea Generation, is fairly self-explanatory and essentially refers to the process of finding or creating ideas for innovation. Hansen and Birkenshaw (2007) suggests that new ideas can be generated internally (within groups or organizations), through cross-unit collaboration, or externally. The refer to these three process as In-house-, Cross Pollination, and External.

The next phase, Idea Conversion, refers to the process of turning new ideas into an innovation. In this regard Hansen and Birkenshaw (2007) propose that organizations need to manage the screening and funding of these ideas for further development. They refer to this process as selection. This is followed by the process of actually developing ideas into new products or services, referred to as development.

And finally the last phase in the IVC is that of Diffusion, which refers to disseminating developed ideas across, but also outside of the organization.

In terms of organizational culture the literature reveals several definitions. See Van der Westhuizen, Mosoge, Swanepoel and Coetsee (2005) for an analysis of 15 of these. However the simplest and seemingly most effective definitions however still
seems to be: "the way things are done around here" (Bower, 1966). This is also the operational definition used in the research that is reported in this paper.

There are of course several theories and models in this regard such as those suggested by Cameron and Quinn (1999), Denison et al. (2014), Handy (1995), Hofstede (1980), and Schein (1991). For the purpose of this study however the X Model of Organizational Culture (Smit et al., 2008) was used since it contains elements from many of the previously mentioned theories and models of organizational culture. This models suggests that organizational culture has five core dimensions namely, Leadership, Adaptability, Strategy, Relationships and Coordination. These are briefly defined as:

- Leadership: Referring to how people lead in the organization;
- Strategy: Referring to how organizations strategize;
- Adaptability: Referring to how organizations respond to change;
- Coordination: Referring to how systems and processes are aligned (vertically and horizontally) in an organization;
- Relationships: Referring to how individuals and groups in the organization deal with each other (Smit et al., 2008).

Each of these dimension contains several sub-elements as explain in Smit et al. (2008)

These two models (the IVC and the X Model) were therefore used as the empirical basis for the design of a measurement tool in order to study the relationship between the variables in question. The research process is explained in the following section.

METHOD

The Questionnaire

The tool for data collection in the original study was a questionnaire that contained four sections:

- One that focuses on biographical information,
- One on organizational culture,
- One on the IVC, and
- One on adoption.

To measure organizational culture several items were used for each of the organizational culture dimensions (Leadership, Strategy, Adaptability, Coordination and Relationships) from the X Model (Smit et al., 2008). For the IVC section there were three items for measuring Idea Generation, three for Idea Conversion, and one for Idea Diffusion, all of these being derived from the constructs proposed by Hansen and Birkenshaw (2007). For the purpose of this paper the data that was collected for the section focusing on innovation adoption was not used.

Both the organizational culture element and the IVC element of the questionnaire have been validated in previous studies (Forster, 2006). All the items, except for the biographical section, were of the Likert scale type, where respondents had to select to what extent they agree or disagree with statements offered in the questionnaire.

Sampling and Data Collection

As mentioned in the introduction, data was collected from 21 organizations in seven countries. One of these countries was Ireland where several organizations were approached to participate in the study. They were identified through convenience sampling as research students, who were doing an internship in these organizations, were asked to collect the data at their place of work. In total seven organizations from Ireland participated in the survey and 404 respondents completed the questionnaire.

The organizations ranged in size from large, medium to small as derived from the Europa Summaries of Legislation (2015) which states that medium organizations have less than 250 employees, and small organization less than 50. For this study large organization were those who have more than 250 employees. No micro organization (less than 20 employees) took part in the study.

In summary one small-sized organization, four medium-sized organizations and two large organizations participated in the study. Table 1 presents the number of respondents from each of the groups of organizational sizes.

<table>
<thead>
<tr>
<th>Organization Size</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>219</td>
<td>54,2</td>
</tr>
</tbody>
</table>

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Table 1: Organizational sizes

<table>
<thead>
<tr>
<th>Size</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>161</td>
<td>39.9</td>
</tr>
<tr>
<td>Small</td>
<td>24</td>
<td>5.9</td>
</tr>
<tr>
<td>Total</td>
<td>404</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As can be seen in Table 1 most responses came from the two large organizations (54%) and least from the small organization (almost 6%).

Table 2 depicts the industries in which the participating organizations operate and how many responses were received for each organization. For ethical purposes the names of the organizations are not revealed and coded names (e.g. Organization 1 etc.) are used.

<table>
<thead>
<tr>
<th>Organization ID</th>
<th>Size</th>
<th>Industry</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization 1</td>
<td>Medium</td>
<td>Food &amp; Beverage</td>
<td>29</td>
<td>7.2</td>
</tr>
<tr>
<td>Organization 2</td>
<td>Small</td>
<td>Education</td>
<td>24</td>
<td>5.9</td>
</tr>
<tr>
<td>Organization 3</td>
<td>Large</td>
<td>Health</td>
<td>117</td>
<td>29.0</td>
</tr>
<tr>
<td>Organization 4</td>
<td>Large</td>
<td>IT</td>
<td>102</td>
<td>25.2</td>
</tr>
<tr>
<td>Organization 5</td>
<td>Medium</td>
<td>Hotel</td>
<td>41</td>
<td>10.1</td>
</tr>
<tr>
<td>Organization 6</td>
<td>Medium</td>
<td>Professional Services</td>
<td>58</td>
<td>14.4</td>
</tr>
<tr>
<td>Organization 7</td>
<td>Medium</td>
<td>Hotel</td>
<td>33</td>
<td>8.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>404</td>
<td>100</td>
</tr>
</tbody>
</table>

In Table 2 the coded names of the organizations, organizational size, which industry they operate in, the number of responses and percentage is presented in the columns. As can be seen the largest number of responses came from an organization in the health industry (29%) followed by an organization in the IT industry (25%). It is notable that these are also the two large organizations. The least number of responses came from a small organization (24 responses) and this was also the number of employees in the organization. So the full population of this organization participated.

Data Analysis

For the analysis the data was imported to SPSS and several tests were conducted. The analysis consisted of two activities namely:

- A correlational analysis to investigate the relationship between the variables
- A regression analysis to investigate the nature and strength of the relationships between the variables

FINDINGS AND DISCUSSION

In this section the findings of the correlation analysis and the multiple regression analysis are presented and discussed briefly.

The correlations analysis

A correlation analysis was conducted to determine if there are relationships between the various culture elements and the phases of the IVC. The findings are presented in Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Idea Generation</th>
<th>Idea Conversion</th>
<th>Diffusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>.438**</td>
<td>.379**</td>
<td>.329**</td>
</tr>
<tr>
<td>Strategy</td>
<td>.422**</td>
<td>.534**</td>
<td>.480**</td>
</tr>
<tr>
<td>Adaptability</td>
<td>.609**</td>
<td>.568**</td>
<td>.460**</td>
</tr>
<tr>
<td>Coordination</td>
<td>.518**</td>
<td>.591**</td>
<td>.537**</td>
</tr>
</tbody>
</table>
As can be seen in Table 3 almost all of the correlations range from moderate to strong positive and they are all significant to the 0.01 level. It is interesting to note that Adaptability and Coordination have the strongest relationship with Idea Generation \((r=0.609\) and \(r=0.518\) respectively) This implies that if organizations are aware of their environment and can respond to changes in it, and if they are also able to align their processes and system horizontally and vertically, then it is likely that they will also be able to generate new ideas, either internally or in collaboration with others.

When it comes to Idea Conversion it seems that all the culture variables, except Leadership, are moderate to strongly related to the ability of organizations to convert ideas into new products and/or services. The coefficients range from \(r=0.534\) (for Strategy) to \(r=0.591\) (for Coordination). In terms of the relation between organizational culture and the innovation value chain it is clear that the strongest relationship exists between the culture of an organization and its ability to convert ideas.

Diffusion shows slightly weaker relationships with organizational culture except for the ability of organizations to align its systems and processes horizontally and vertically (Coordination). Here a coefficient of \(r=0.537\) is revealed.

Nevertheless it has to be noted that in general organizational culture seems to have a significant relationship with innovation in organizations, more specifically the way organizations come up with ideas, convert them to tangible artefacts and are able to spread these.

The regression analysis

A multiple regression analysis was conducted in order to study the predictors for Idea Generation, Idea Conversion, and Diffusion. Five predictors were used in the model namely Leadership, Strategy, Adaptability, Coordination and Relationships. The results are presented below. For lack of space only the regression model and coefficients are presented for each of the dependent variables. The model summaries and the ANOVA results and coefficients are not presented, but are available on request. However in summary it can be mentioned that the findings from the correlations analysis was confirmed in the model summaries when each of the three elements of the IVC were used as dependent variable. The F score ranged from 0,614 to 0,702. Furthermore the regression models in all three cases were statistically significant.

The regression model and coefficients for Idea Generation is presented in Table 4.

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficients*</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficients</td>
<td>Standardized Coefficients</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.714</td>
</tr>
<tr>
<td>Leadership</td>
<td>.132</td>
<td>.050</td>
</tr>
<tr>
<td>Strategy</td>
<td>.049</td>
<td>.054</td>
</tr>
<tr>
<td>Adaptability</td>
<td>.425</td>
<td>.057</td>
</tr>
<tr>
<td>Coordination</td>
<td>.055</td>
<td>.073</td>
</tr>
<tr>
<td>Relationships</td>
<td>.094</td>
<td>.065</td>
</tr>
</tbody>
</table>

*a Dependent Variable: Idea Generation

Table 4: Coefficients, Idea Generation

The standardized regression coefficients reveal that only one of independent variables is a statistically significant (Sig ≤ 0.05) predictor for Idea Generation. The strongest predictor is Adaptability at \(\beta=0.443\). This implies that when organizations are in
contact with their environment and are able to respond to changes in it, that it is likely that the result would be that they become better at generating new ideas. This also confirms the findings of the correlation analysis as presented earlier.

Table 5 presents the findings of the regression analysis when Idea Conversion is used as the dependent variable.

![Table 5: Coefficients, Idea Conversion]

The standardized regression coefficients presented in Table 5 reveal that four of the five of independent variables are statistically significant (\(\text{Sig} \leq 0.05\)) predictors for Idea Conversion. The Beta scores range from the strongest predictor being Coordination at \(\beta=0.297\) to Relationships being \(\beta=0.175\). This implies that when organizations are able to strategize well, are in contact with their environment and are able to respond to changes in it, that are able to align their systems and processes and that have a strong ability to work together, then it is likely that they become better at converting new ideas into products and services. This once again also confirms the findings of the correlation analysis as presented earlier.

In Table 6 the findings for the regression analysis with Diffusion as dependent variable are presented.

![Table 6: Coefficients, Diffusion]

As can be seen in Table 6 the standardized regression coefficients reveal that two of the five of independent variables are statistically significant (\(\text{Sig} \leq 0.05\)) predictors for Diffusion. The Beta score for the strongest predictor is Coordination at \(\beta=0.333\) and for Strategy it is \(\beta=0.202\). This implies that organizations that are able to align their systems and processes and also able to strategize well will likely be better at spreading new ideas through the organization and outside of it. This also confirms the findings of the correlation analysis as presented earlier.
CONCLUSION

In conclusion it can be argued that this study confirms previous suggestions that organizational culture and innovation are related to each other. More specifically in this study it becomes evident that the ability of organizations to innovate by generating ideas, converting them and spreading the resultant products and/or services is related to how organizations perform in terms of Leadership, Strategy, Adaptability, Coordination and Relationships. The particular contribution of this study is mainly its focus on the Innovation Value Chain and how this might be related to culture. The findings reveal that in particular the ability of organizations to convert ideas into new products or services can be explained by variance in the ability of the organization to Strategize, Adapts, Coordinate and Relate to each other (for instance through team work).

REFERENCES