

THE RELATIONSHIP BETWEEN INFORMATION SYSTEMS MANAGEMENT AND ORGANIZATIONAL CULTURE

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ABSTRACT

This paper essentially presents an exploration of the relationship between organizational culture and information systems management. Three contributions are offered namely the findings of a study of the organizational culture and information management competencies of five organizations in the Netherlands, with particular reference to the reliability of the measurements tool that was used, as well as an exploratory study of the relationship between organizational culture and the ability of an organization to manage its information systems. A brief review of the literature reveals that these two concepts in combination have been studied extensively, but that their conceptualization are somewhat fragmented in nature. In an effort to study the relationship using a more inclusive frame of reference the paper then presents a description of two models that were used the foundation for the design of a measurement tool to investigate the topic. The results provides a description of the general culture and information systems management abilities of the organizations and also suggest that the measurement tool is indeed reliable. Further analysis reveals that several variables from within each of the two main concepts, organizational culture and information systems management, are correlated.

KEYWORDS: *Organizational Culture , Information Systems Management.*

INTRODUCTION

Considering the importance that is being ascribed to IT-business alignment by organizations (Chen, 2010) it is becoming less debatable whether there is a relationship between organizational issues such as organizational culture (OC) and the ability of organizations to manage information technology (IT) and information systems (IS). Evidence from research on this topic supports the argument that this relationship exists (Gouliemos, 2003; Leidner & Kayworth, 2006; Lowry et al., 2010; Shih et al., 2010). The question that becomes more relevant is what the nature of this relationship is.

This paper reports on a study of which the purpose was to investigate the relationship between specific elements of OC and Information Systems Management (ISM). In addition the relationship between the readiness of an organization to change and its ability to manage IS was also investigated. The goals of the project were to continue as well as extend previous research by Smit and DelleMijn (2011) by testing the relationship between the same variables using a different sample as well as by extending the focus area to

include CR issues and how they may be related to ISM in this area. In order to provide some background it has to be mentioned that the original purpose of this project was to make a contribution to practice by generating an understanding of the OC, ISM and Change Readiness (CR) issues that may relate to, and influence the success of Customer Relationship Management (CRM) systems in the Netherlands. However the data that was collected also provided an opportunity to investigate the relationship between these concepts. It has to be noted at this point that for this study CRM systems is assumed to be a type of IS.

Therefore for the remainder of the paper the terms IS and ISM are used. The first section reviews the literature on these topics and presents some research that precedes this investigation. This is followed by a description of the research process. The findings are presented and discussed and is followed by a concluding section that also offers some recommendations for practice and future research. In order to study the relationship between the various concepts one needs to use sound theoretical foundations to guide the thinking on these topics. The main concepts and the theoretical thinking behind them are briefly explored in the next section.

OBJECTIVE

1. To study the relationship between information systems management and organizational culture
2. To study the reliability of the IMBOK questionnaire

RESEARCH METHOD

The Questionnaire

During the preparation phase the questionnaire itself was prepared and the survey software and information technology environment was prepared for the survey. The final questionnaire consisted of 4 sections:

- Biographical items
- Organizational culture items
- IMBOK items

The biographical items consisted of several types of questions including selection of managerial level and entering of organization name.

The organizational culture section of the questionnaire consisted of 27 questions related to the 5 core elements of the X Model of Organizational Culture (Smit et al., 2008). This organization culture section of the questionnaire has previously been validated (Forster, 2006). The IMBOK section contained either 4 or 5 items for each of the knowledge areas of the framework resulting in a total of 24 items. These items were designed to explore CRM related issues in terms of these 5 knowledge areas. All the items, save for those in 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

Five organizations in the Netherlands were selected to participate in the study. They were identified through convenience sampling as they were past or current clients of a local CRM consultant. As a result all participating organizations already had a CRM system or was in the process of upgrading their existing system. One of the organizations was from the retail industry, while the other four were from the services industry. The organizations ranged in size from medium to large. Research assistants collected the data from the five organizations and the data was captured into a spreadsheet. An average of 38 respondents from each organization completed the survey resulting in a sample size of 192 respondents. For the analysis the data was imported to SPSS and several tests were conducted. This is described in the next section of the paper.

ANALYSIS

The analysis consisted of three activities namely:

- An analysis to determine the reliability of the IMBOK aspect of the measurement tool (the culture section has already been validated as mentioned earlier);
- An analysis of the general status of the organizations in terms of their culture and CRM systems management, and
- A correlational analysis to investigate the relationship between the variables.

To investigate the measurement tool item analysis and exploratory factor analysis were used. In addition, the original factor structure of the IMBOK construct was evaluated using structural equation modeling for the purpose of confirmatory factor analysis. To obtain a description of how well organizations manage their information systems and to get a view of the organizational culture of the participating organizations all the positive responses to the Likert type responses were counted and expressed as a percentage (%) of the total number of responses. For a simple example: if 3 out of 10 respondents agreed with the statement: "My organization adjusts well to change", then it would mean that 30% of the respondents agree with the statement. This in turn could be interpreted as a low rating which means that the organization/s in question do not respond well to change.

In order to investigate the relationship between information systems and organizational culture a correlational analysis was done using Pearson r .

DISCUSSION

In this section the findings are presented in three parts, namely the results of the reliability testing, a description of the CRM status of the organizations and a description of the correlations between the variables.

The Reliability of IMBOK

In terms of reliability the results reveals the scores as depicted in Table 2. Of the 51 items in the questionnaire 24 focused on information systems management. Six items were identified that may negatively impact the reliability of the instrument. The second and third column of Table 1 presents reliability before and after these items were removed. In both instances it is clear that the tool remains reliable with scores of 0.649 and higher.

Table 1: The Reliability of the IMBOK Questionnaire.

| | Reliability | | |
|------------------------|---------------------------|----------------------------------|-----------------|
| | Original Structure | Reliability Items Removed | |
| Information Technology | 0.649 | 0.689 | 2 items removed |
| Information Systems | 0.832 | - | 0 items removed |
| Business Processes | 0.792 | 0.810 | 1 item removed |
| Business Benefits | 0.655 | 0.696 | 1 item removed |
| Business Strategy | 0.799 | 0.842 | 1 item removed |
| Overall Reliability | 0.905 | 0.890 | 6 items removed |

The results of the factor analysis and reliability testing reveal an overall reliability of 0.905 and when the relevant items are removed the reliability drops slightly to 0.890. Table 2 presents also presents the results of the confirmatory factor analysis for two measurement models namely the original structure as well as a measurement model where the previously mentioned 6 items were removed. The last column provides an indication of the criteria that must be met where applicable.

Table 2: Results of Confirmatory Factor Analysis.

| | Original Structure | 6 Items Removed | Must be... |
|--------------|---------------------------|------------------------|-------------------|
| χ^2 | 432.88 | 201.04 | Lower is better |
| <i>df</i> | 242 | 109.0 | |
| RMSEA | 0.064 | 0.066 | Smaller than 0.08 |
| SRMR | 0.96 | 0.97 | Bigger than 0.9 |
| CFI | 0.92 | 0.94 | Bigger than 0.9 |

The results of the factor analysis and confirmatory factor analysis confirm the credibility of the dimensions and the items. The tool is reliable and will remain so with minor adjustments.

The Organizational Culture of the Sample

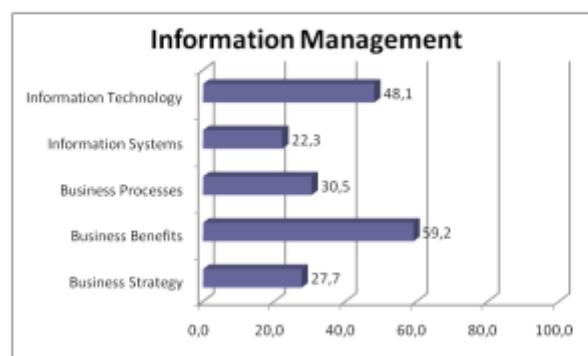
The findings in terms of organizational culture are depicted in Figure 3. The focus is on "how things are done in the organization" in terms of the 5 core elements of organizational culture.

Figure 3: Organizational Culture Results.



As can be seen in Figure 3 Leadership (69.2%) seems to be rated high in these organizations which implies, in terms of the X Model (Smit et al., 2008), that leaders in the organizations are able to influence people positively towards a specific goal. Relationships (63.2%) is also rated high which indicate that teams and individuals in the organizations are able to work together well. Strategy (44.5%) and Coordination (54.2%) are rated lower, implying that these organizations do not have a clear view on its strategic direction, and are also struggling to align their processes and systems. Figure 4 present the findings relating to IS Management. In this case the focus is on how well organizations manage information systems.

Figure 4: Information Systems Management Results.



For the purpose of this study there were several items in the questionnaire for each of these competency areas. The score for each knowledge area, as presented in Figure 4 depicts the average rating of all the items related to that specific knowledge area. From Figure 4 it is clear that ratings for some of the

knowledge areas are quite low. The ratings for Information Systems (22.3%) and Business Strategy (27.7%) are particularly low.

When it comes to Information Systems a closer look at responses to individual items reveal that respondents believe that:

- Their information systems do not support their efforts to reach CRM related business goals;
- Reports from CRM related information systems do not help them to achieve their results;
- Their information systems do not provide them with all the information they need about customers or partners.

In terms of Business Strategy most respondents believe that:

- They do not have good information systems and technology strategies;
- Information system and technology strategies are not aligned with business strategies;
- Decisions regarding investment in systems and technology are not guided by business strategies.

Correlational Analysis

The correlational analysis reveals the results presented in Table 3.

Table 3: The Correlations for the Full sample (192 Respondents).

| | Leadership | Strategy | Adaptability | Coordination | Relationships |
|------------------------|------------------|------------------|--------------|------------------|------------------|
| Information Technology | 0,215(**) | 0,308(**) | 0,188(**) | 0,443(**) | 0,255(**) |
| Information Systems | 0,087 | 0,310(**) | 0,082 | 0,293(**) | 0,197(**) |
| Business Processes | 0,246(**) | 0,466(**) | 0,243(**) | 0,562(**) | 0,314(**) |
| Business Benefits | 0,461(**) | 0,480(**) | 0,322(**) | 0,637(**) | 0,516(**) |
| Business Strategy | 0,182(*) | 0,455(**) | 0,172(*) | 0,450(**) | 0,240(**) |

* Significant at the 0.05 level (2-tailed). **Significant at the 0.01 level (2-tailed).

The results clearly indicate moderate to strong correlations (above 0.400) that are significant at the 0.01 level between several organizational culture and information systems management variables. These are highlighted in bold text in the grey cells of Table 3.

Business Benefits has a moderate to strong correlation to all but one of the five organizational culture elements, which implies that organizations who can manage the benefits that they derive from business

processes well also have a fairly strong positive culture particularly in terms of Leadership, Strategy, Coordination, and Relationships.

The strongest correlations can be found between the culture variable Coordination on the one hand and Business Processes (0.562) and Business Benefits (0.637) on the other hand. This in turn implies that organizations who are able to properly align systems in the organization are also likely to understand their business processes well and are able to derive the benefits that these processes should offer and manage them well. This is also true for the correlation between relationships and business benefits (0.516).

The findings represented in Table 3 were calculated on the whole sample of 192 respondents. These 192 respondents hail from five organizations. These organization could be regarded as a somewhat diverse since one is a retail organization and the others not and because they also differ in size. It could be assumed that these organizations also differ in the nature of their organizational culture. Furthermore the sample sizes for each organization was also different. For interest sake therefore the correlations for the organization with the largest sample was also tested. The assumption was that this offers a more homogeneous sample. Table 4 represents the findings of this test.

Table 4: Correlations for one Organization (87 Respondents).

| | Leadership | Strategy | Adaptability | Coordination | Relationships |
|---|-------------------|------------------|---------------------|---------------------|----------------------|
| Information Technology | 0,255(**) | 0,299(**) | 0,255(**) | 0,398(**) | 0,342(**) |
| Information Systems | 0,100(*) | 0,195(*) | 0,079 | 0,229(**) | 0,210(**) |
| Business Processes | 0,218(**) | 0,416(**) | 0,268(**) | 0,491(**) | 0,361(**) |
| Business Benefits | 0,497(**) | 0,547(**) | 0,515(**) | 0,719(**) | 0,549(**) |
| Business Strategy | 0,187(*) | 0,403(**) | 0,182(*) | 0,414(**) | 0,295(**) |
| **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). | | | | | |

As can be seen when comparing the moderate to strong correlations (above 0.400 in the grey cells) in Table 3 and Table 4 a roughly similar pattern emerges. It is worthy to note that for this single organization Business Benefits is moderately to strongly related to all of the organizational culture elements. The correlations between the individual variables do differ when calculating it for one organizations. The relationship between Business Benefits and Coordination is still the strongest however at 0.719, which is also higher for the full sample. The interpretation of this similar pattern could be once again be that

organizations who have a strong organizational culture are also able manage the benefits that they derive from their business processes better.

CONCLUSION

This paper presented the results of an investigation into the CRM status of five organizations in the Netherlands, the reliability of the tool that was used to study this construct as well as an exploratory study of the relationship between organizational culture and the ability of an organization to manage its information systems. A brief review of the literature reveals that these two concepts in combination have been studied extensively, but that the conceptualization of these concepts vary greatly. In an effort to study the relationship using an more inclusive frame of reference the paper then presented a description of two models that were used as the foundation for the design of a measurement tool to investigate the topic. The methodology was described including the results of an analysis to determine the reliability of the tools. Finally the results of the general culture and information systems management abilities of the organizations were presented, followed by a description of a correlational analysis. Some limitations of this study was the size of the sample and the fact that it consisted of a heterogeneous sample. In addition the potential for spurious relationships or intervening and/or moderating variables can also not be excluded. It would be recommended for future research to use larger samples as well as a more homogeneous population and to also conduct some multi-variate analysis. In addition it would be most useful to use the findings of a correlational analysis as the basis for hypotheses to study the relationships between these constructs. The most useful finding of the study was that the measurement tool is reliable and that some moderate to strong correlations do exist between organizational culture variables and information systems management variables. Because the measurements tool is found to be reliable the contribution to practice is therefore a tool that may be used with some confidence to diagnose or describe the culture and information systems management capabilities of organizations. Furthermore a more immediate contribution of this research to practice is the indication that there is a reasonably strong relationship between organizational culture and the ability of an organization to manage its information systems. In general it is therefore possible to predict that organizations with a strong positive culture are likely to have strong information systems management capabilities. Practically speaking this in turn implies that organizations who address organizational culture issues or problems are likely to see an improvement in their ability to management information systems.

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