

# Influence of Organizational Culture and Communication on the Successful Implementation of Information Technology in Hospitals

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**Abstract.** In this paper, we report on a case study examining types of organizational culture influencing communication as an important factor in the study of successful IT adoption and implementation in health care. We observed a hospital organization and focused on technological innovations and the accompanying communication factors in the successful implementation of IT. The results demonstrate the importance of the organizational culture as an important factor in establishing well-balanced communication as a primary influence factor in the implementation of new technologies. Based on theoretical and empirical insights, we propose a model describing the relationship of organizational culture, communication, and the level of success in the implementation and adaptation of new IT systems in hospitals.

**Keywords:** Communication, Empathy, Hospital Culture, Information Technology, Model.

## 1 Introduction

Hospital administrators worldwide have recognized the importance of information technology (IT) as a strategic factor (see e.g. [1]). Success with technological innovation demands considerable strategic preparation. However, at many hospitals investments in information technology are viewed more as a necessary burden, than as a strategic requirement [2]. Hence, there is a need for a deeper investigation into the impact of culture and communication in relation to success when new IT is implemented within the organization of hospitals (e.g. [3]).

Apart from technological issues, organizational culture has to be considered when adapting and implementing new technologies. Successful communication for IT transformation needs to consider different mentalities, thought patterns and adaptation strategies that are anchored in culture. Thereby, communication requires mutual understanding in which empathy is a prerequisite [4]. Despite the noticeable importance of the empathy factor in communication and IT transformation, literature lacks studies regarding the relationship of organization culture in relation to empathy, communication, and IT system introduction success.

We investigated these relationships using the example of hospitals and demonstrate which organizational culture and characteristics enhance communication and therefore IT implementation success.

## **2 Background and Related Work**

### **2.1 Organizational Culture**

Organizational culture depends on the values and norms regarding technology and change. The knowledge transfer process requires empathy as the capacity to recognize emotions being experienced by another being [5]. Current research rather poorly focuses on this fact. When a new technology system is introduced, different reaction arises from individual staff members. The more empathy is engendered the more likely a smooth and efficient arrangement can be reached. Meanwhile, culture, through its myths, sagas, and organizational stories, provides “cognitive maps” that help organizational members orient themselves to organizational interactions and technological development [6].

Quinn’s competing values typology of organization culture is based upon two dimensions of implicit beliefs, and relies on human information processing within an organization in terms of spontaneity vs. predictability as well as external vs. internal factors. This results in four culture types and characteristics: developmental (flexible/external as e.g. adaptability, growth, risk taking); rational (predictable/external as e.g. planning, efficiency,); hierarchical (predictable/internal as e.g. stability, information management); and the group (flexible/internal as e.g. cohesion, morale) [7].

It has been found in competing research works [8-10], that value frameworks that the validity of measuring the cultural dimensions that are common across organizations, as well as evaluating culture types are relative to other variables [11]. This approach allows understanding the values underlying the organization cultures and to take action to communicate the organization the desired results.

Thus, the four culture types of developmental, rational, group and hierarchical will be adapted and discussed in this study in relation to communication.

### **2.2 Communication**

Competitive technology innovation depends largely on the organizational ability to communicate IT knowledge to individuals [12, 13]. Thereby, communication focuses on the means to implement innovations. Organizational communication includes the

verbal and nonverbal communication that is used to influence the working environment in an organization. To implement new technology in an organization, communication in line with their organization culture plays a significant role. In the context of this paper, we focus on the review on using empathy for facilitating successful IT implementation based on the organization culture types before we propose implementation actions [4, 5].

Organization culture with its values influences the desire for a reaction to information that is gathered and transformed through the external and internal communication channels and turned into organizational knowledge. A culture that values both - an external focus (i.e. the improvement of its competitive position) and an internal focus (i.e. the maintenance of its socio-technical system) may maximize its efficient use of innovation [14]. Thus, communication is affected by the value an organization places on meeting the innovation completion or internal efficiency.

In addition, organizations react quicker to general environmental events, when the organizational values, perspective and policies reflect these [15]. Hence, if new technology introduction is too distant from the organization's expectations, the organization may resist accepting it, resulting in its rejection.

Therefore, communication channels enabling the consistent communication of innovation and organizational change are the key element in adapting new technologies.

### 2.3 Communication Channels

A communication channel is defined as a means by which information is moved from one point to another within the social system [16], and so communication channels are important for IT adoption. After reviewing research from a variety of research streams, [17] concluded that when communication is frequent, project teams are more likely to adapt and that they become more efficient at using the information gathered (similarly at applying agile methods, cf. [18]). In addition, boundary spanning, both inside and outside the organization, is important to skill and knowledge development and transmitting. External information must be mixed with those information already in use in the organization [19]. External communication channels can include the use of external sources of knowledge (e.g. periodicals), the existence of internal technical expertise, or boundary spanners that can recognize innovations of value, and internal structure that provide the bridge between external knowledge and the organization. This suggests that communication for new technologies is enhanced when internal and external information is addressed.

Internal communication channels linking organizational members should enhance knowledge flow once the idea for a new IT has entered the organization. Based on observing several organizations involved in knowledge management projects, Davenport et al. [20] suggest that a culture for multiple channels for knowledge transfer is important. Such communication channels include regular scheduled meetings and standard reports.

To allow external technical knowledge to reach organizational members, organizations often hire new staff, access documents describing new developments, trained within the organization, encourage personal contacts with knowledgeable individuals

outside the organization, and use other external communication channels (e.g. meetings, workshops etc.) [21].

In sum, external and internal communication channels supported by empathy constitute an organization's communication which is the basis for successful adaption of information technologies. Organizational culture would likely influence communication leading to IT implementation success.

Therefore, we will analyze organizational culture, empathy based communication and communication channels as well as the potential relationship between organizational culture, communication and IT implementation success.

## 3 Case Study

### 3.1 Method

Design research involves the analysis of the use and performance of designed artifacts to understand, explain and improve the behavior of information systems. The design science paradigm seeks to extend the boundaries of user and organizational capabilities by creating new and innovative artifacts, including constructs, models, methods, and instantiations [22, 23]. The act of designing new innovative solutions does not occur in isolation, but is a process of constant engagement with practitioners and artifacts are constructed as a living process engaging practitioners [24].

Thereby, the Design Science Research Methodology (DSRM) was applied for a large public hospital located in Dublin County that adapted several information system transformations. Following the general principles of conducting case studies [25], as including written materials, organizational structure reviews, open-ended and structured interviews, use of informants and focus groups as well as absorbing and noting details and actions in the field environment, Figure 1 shows the suggested research method.

The research was conducted in three phases, always considering engaging the study's participants. The first phase was to carry out an onsite survey to determine the general information about organization structure, organizational values and norms, daily communication patterns, technology embracement, etc. The second phase was to conduct the in-person interviews to determine the hospital culture types, system or new system implementation strategy and capability and their IT or system success satisfaction levels. The third phase was to analyze the results seeking for clear connections among the culture types, communication and success of IT implementation.

As the interview subjects for semi-structured interviews for this study, we found six top managers exhibiting a broad view of the organization regarding the organization's environment, available resources, workflow pattern and values [26]. We asked them to address issues regarding system implementation, influential factors, culture types, hospital communication channels and communication means as well as their IT adoption and implementation satisfaction level. The organizational culture questionnaire is adopted from [27], where questions for interviewees use the Likert-like five-point scale for scoring. The definitions are displayed to the interviewees before answering any of the structured questions. The communication questionnaire

consisted of questions that are related to communication channel and empathy. As communication channels can be viewed as external (boundary spanning) or internal (transfer of knowledge within the organization), the interview questions to analyze the communication channels contained condensed items from [28] and [16]. To address the aspect of empathy, the respondents were asked on their social awareness and emotional competencies on the staff when the new system was to be implemented.

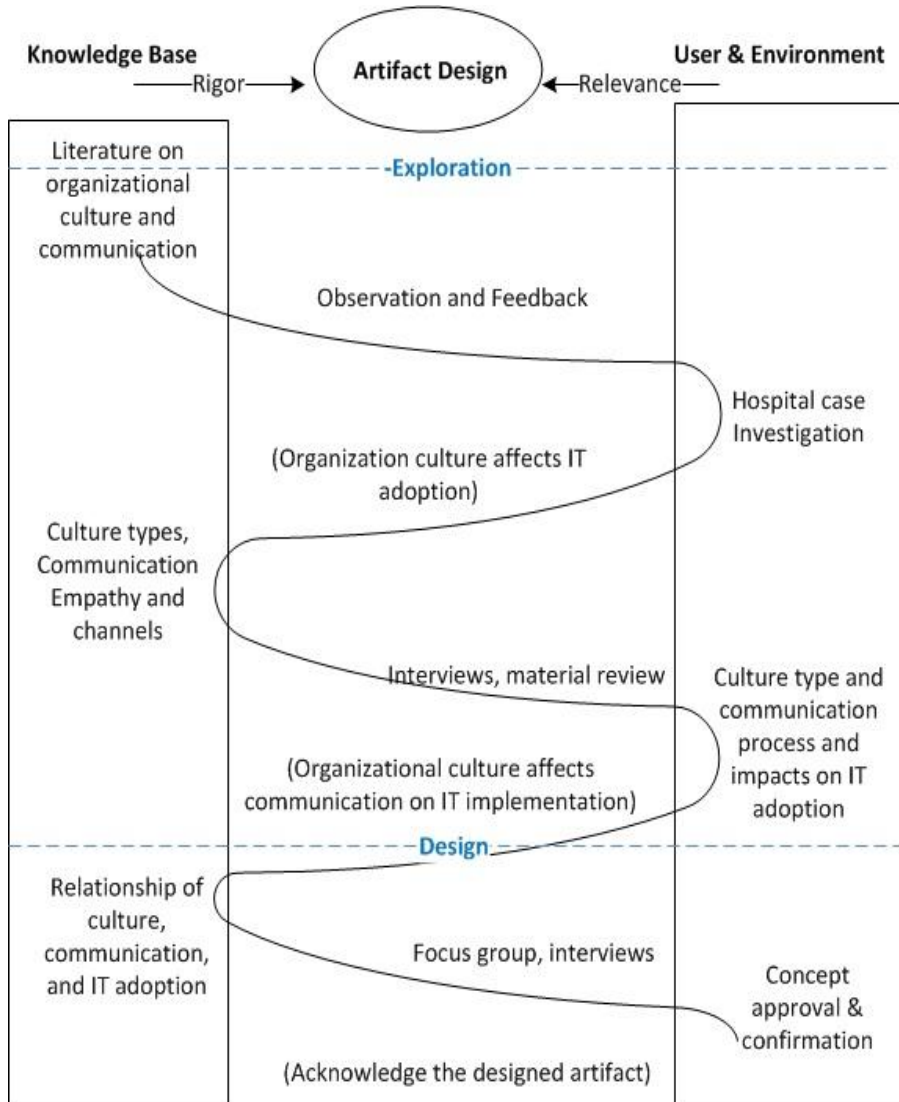


Fig. 1. Proposed Research Method Integrating Theoretical and Empirical Aspects

### 3.2 Results

The results indicated that the investigated hospital consists of *hierarchical* and *rational* culture types. The organizational structure of the hospital embraces a group of the powerful at the top with subsequent levels of power beneath them representing the dominant mode with different levels of management, power and authority. The managers state that such a structure emphasizes stability and control which cause resistance to change when any new technology or system is introduced. In their experience, such highly mechanistic structures with hierarchical values led to the failure in the implementation of advanced technologies because of the hospital's inability to adjust to the new technology. For instance, the introduction of the electronic medical records (EMR) system started in 2005, and it is still on hold after eight years. Such a structure led to limited communication channels due to the bureaucracy associate authorities and layers. At the implementation level, the means of communication is addressed with limitation as well. The CEO remarked on the challenge and frustration of initiating the system change that all levels of managers in the hospital have to be convinced that for system adoption. However, quite often mutual agreement cannot be reached due to various reasons localized resisting within a department or group of employees that means, efforts and time investment may just end up project with pending. This hierarchical culture is very common in the public sector and is very difficult for a complete change. In addition, the hospital also consists of rational culture type. It places emphasis on matters of external environment. This leads to the organization's main operation mechanism being based on economic considerations and likewise on competitiveness and productivity [29]. The bond between the hospital members is built on profit motives. Managers are encouraged to emphasize results and achievement of goals, but are discouraged to consider the works environments. When a new system is to be adopted for usage, communication focus is external (being competitive) and the communication within the hospital does not encourage empathy factors. One top manager stated that it is good to promote productivity by adopting any new systems, but it is also very important to have the staff passionately learn and use the system so that they positively embrace the change and operate with it well in the long run. In the hospital environment patient care delivery is the focus; however the outcome for patient treatment may not yield immediate profits. At the same time because rational culture is task-oriented and inclined towards independent action, it lacks teamwork and knowledge sharing, which withdraws back the long term benefits from new technology implementation. In that sense, the means of communication for system or technology change can be gentler and more humane, this means, that because communication involves empathy it will lead to a better and smoother transition.

To put it in a nutshell, the case study results support the claim found in literature that for successful IT implementation, hierarchical culture should be minimized and rational culture should be mixed with the empathy factor through communication.

## 4 Discussion

The review of the related work and the output of the conducted case study confirmed that communication channels and the empathy factor are key elements of communication related to successful IT implementation. These communication skills also have to be in line with the organization culture types. Communication focuses on the process and means to adopt IT, whereas, organization culture focuses on the value and norms regarding technology. Therefore, organization culture influences communication approaches for successfully implementing IT in hospitals. We think that strong organization cultures support greater sharing of information (group culture) and development of new approaches (developmental culture) which tend to facilitate communication by addressing empathy and communication channels and therefore facilitate IT adoption and implementation. Figure 2 shows the conceptual model derived from the integration of the findings from the case and literature study.



Fig. 2. Proposed Model for Improving IT Implementation Success

As discussed above, types of cultures that promote an external focus (i.e. developmental and rational) would promote change include risk taking, openness, and high expectations for action [30]. In that sense, the external focus culture types of developmental and rational would be conducive to developing communication channels. A cultural reward system that supports participation and knowledge sharing would also be important in developing communication. Therefore, a strong group culture would lead to greater internal communication channels.

Culture types also affect the intention of addressing empathy in communication. An organization with strong developmental culture will be likely to assimilate the cognitive model of its counterpart for desired outcomes. The same applies to the group culture, where affiliation emphasizes mutual understandings and members are more likely to use empathy as a means to reach a certain purpose (e.g. adopting and using newly introduced technologies). Alternatively, hierarchical culture with its emphasis on stability and control are most likely to result in resistance to change and less sensitivity for the environment [31]. When bureaucracy associated with hierarchical cultures and bureaucratic delays are reduced, such as in a flatter organization in which manager’s work directly with lower levels, communication and rapid turnaround time for innovation are facilitated.

Furthermore, the case study implied insights into the types of actions that management should undertake in order to enhance communication. These include extensive use of external and internal communication channels, such as exposing internal

groups to external environments and information, encouraging cross-functional teams and groups meetings to exchange information. Communication means should be pleasant and emphasize human feelings with empathy. It may be a productive exercise for managers to look closely at their underlying assumptions, attitudes and values towards organizational applications. In addition, the managers can learn that they are the ones who most influence the shared values reflected in the culture mix that, in turn, affects the hospital attitudes toward leaning and changing necessary to successfully adoption of new technology.

According to the proposed model in Figure 2, it is advisable to address both internal and external communication channels as well as emphasize the empathy factor in communication for successful IT implementation. The implications for the hospital investigated in the case study, this means, that it needs to investigate in how to change or minimize its hierarchical culture to group culture simultaneously strengthening their rational culture by adding empathy factors. The top managers agreed with the approach and signalized positive feedback to a certain degree. Although outlining the detailed plans to change the organization culture is difficult, it pinpoints the importance of relating culture types to communication path to boost IT implementation.

However, the proposed model and its implications must be supported by large scale statistically driven examinations to increase validity and reliability. Therefore, it is planned to carry out a large study using a high number of questionnaires distributed to top managers in healthcare organizations. Descriptive statistics should be performed to uncover the basic characteristics among the samples. The construction validity and reliability of the test methods must be ensured. The expected approach is to use LISREL to perform a conformational factor analysis on the sample data to determine the loadings for the organizational culture types. Thereby, for example, it should be possible to access the fitness of the final model from its absolute fit value, its incremental fit value and its parsimonious fit value [32].

## 5 Conclusions

The main objectives of this study were to define the relationship of organization culture and IT implementation success through communication and empathy. For the technology transformation and implementation, communication is the factor addressed in this study from the perspectives of communication channels and empathy factors. It is found that organization culture affects both communication perspectives, which can exert positive influence on IT implementation.

Communication channels between the external environment and the organization, as well as among the subunits of the organization are important. Our ongoing research on empathy is consistent with communication studies, i.e. emotional and intelligence competencies related to the processes of assimilation, transformation and exploration of knowledge.

Based on the literature and case investigation, we proposed a model to illustrate this relationship and empirically investigated it in a hospital organization. Organization culture types have either positive or negative impacts on technology or system adoption depending on the organizational culture types.



A major contribution of this study is an understanding of the adjustment of the culture types and communication as importance factors for hospitals' success in system implementation. As proposed, communication is related to hospital organization culture. A hospital culture that is focused externally and internally while limiting bureaucracy is most likely to lead to better communication. An external focus (developmental and rational culture) means that hospitals that value flexibility and the improvement of their competitive position are limited to communication and group culture should be mixed in. Hierarchical culture should be minimized in the hospitals.

In the future, large scale statistically driven examinations will be carried out to validate the proposed model.

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