Digital Transformation and Organizational Dysfunctions: a Case Study in Operation in China

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Abstract

The socio-technical perspective has been recognized as the mainstream of Information Systems (IS) philosophy for decades. Besides, a complementary perspective in the IS philosophy, the socio-economic theory, would allow identifying more precisely the business problems, considered "Organizational Dysfunction". Digital transformation is supposed to fix the specific business problem as cross-department communication, and it is essential to involve the analysis of organizational dysfunctions ahead. A case study was conducted in operation in China, where digital transformation was implemented to solve cross-department communication business problems. Beyond this specific business problem, this case study relies on the relevance of the theories "Organizational Dysfunctions" and "Socio-Economic Approach to Management (SEAM)." Focus group was adopted to figure out the key business problem, and semi-structured interviewing for the main root causes. It revealed digital transformation significance on the inefficient cross-department communication through the identification of the analytical results and the theories of Organizational Dysfunctions and SEAM.

Key Words: Digital Transformation, Information Systems Discipline, Socio-economic Approach to Management, Organizational Dysfunctions, Cross-department Communication, Operation

1   Introduction

Digital transformation (DT) is often defined as the application of digital technology

to enhance an organization's abilities to meet its strategic objectives, build capabilities or enhance agility (Cijan et al., 2019). However, organizational dimensions such as adopting processes that allow executives, employees, and staff to investigate, experiment, and strategically employ new technology have been highlighted as an often missing dimension that is critical for success (Lindsay, 2017). Hence, the way to combine technical and social aspects of digital transformation remains a crucial issue, especially how to motivate, engage, and care for the employees in digital transformation (De. Kare-Silver, 2019). This view has been developed historically in the Information Systems (IS) philosophy through a socio-technical perspective (Sarker et al., 2019). However, a complementary perspective in the philosophy of IS, the socio-economic theory, would allow more precise identification of the business problems, considered "Organizational Dysfunction" (Savall and Zardet, 2008). One of these dysfunctions in socio-economic theory is cross-department communication in the organization. The organizational consequences of such errors and dysfunction can be very serious, and it can be regarded as a mechanism that obstruct the normal organizational operation. This is a comparatively perpetual flaw that creates economic and moral wastage beyond the society tolerance. However, the perpetrators do not always be willing to face the consequence, owing to the correlation with their deficiency of intentionality, and some researchers suggested that "Errors and failures, even if non-intentional, are often treated as blameworthy." (Edmondson, 2011). It indicates that even the economic structures would implement non-economic criteria to evaluate such phenomena and mechanisms. Moreover, Kimberling (2021) found out that "The failure of digital transformations implementation in the organization, is oftentimes, with the internal organizational dysfunctions that undermine and ultimately doom a digital transformation." It demonstratively illustrated a relationship between digital transformation and organizational dysfunction. Additionally, a McKinsey consulting report stated that "In Today's China, the consumer-focused Internet is transforming into a more business-oriented Internet. This next wave of digital development promises to have an even deeper impact on China's economy—contributing not only to faster GDP (Gross Domestic Product) growth, but to the growth that is based on productivity, innovation, and consumption." (Wotzel et al., 2014), and Chinese government has already put the digital economy on the agenda of the innovation growth blueprint since 2016, and digital economy has become a critical topic for the government work report (Yan et al., 2020). A number Chinese companies are actively launching some digital transformation projects, and this research is a case study on digital transformation reliance on socio-economic theory, and a case study is conducted about a manufacturing company in China that has been implementing the digital transformation strategy since 2016. The installation of a large number of sensors and the application of 5G technology have made data acquisition and transmission easier than ever before. The use of various digital platform software

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such as ERP (Enterprise Resource Planning), MES (Manufacturing Execution System), CRM (Customer Relationship Management), and SCM (Supply Chain Management) have brought information interconnection to a new height. Highly automated equipment, artificial intelligence, big data, virtual reality, and other technologies make the work of employees more convenient than ever before. Under the framework of increasing digital maturity, the challenges and problems from the perspectives of employees are the topics that the authors addressed. The authors conducted a focus group discussion to accumulate the participants' perspectives, ideas, and faiths on specific topics (Copley Focus Centers, 2012). The authors involved all the department managers in the production, production planning, quality, and maintenance departments, which are the ones with which the authors had the most intensive contact in his business handling. The authors talked with them about the major difficulties related to the previously mentioned challenges that exist in their departments' operation in the company. The management committees were divided randomly into 4 groups, with a fixed number of 7 people in each group, in which "Participants have an equal chance of being assigned to an experimental or control group, resulting in a sample that is, in theory, representative of the population" (Allen, 2017). In general, "Random assignment helps ensure comparable groups, minimizing the influence of individual characteristics" There were a total of 28 participants involved in the discussion, and the overall statics were displayed in the number of groups. After the discussion, they had figured out the major 14 challenges in their departments. They summed up the occurrence frequency in their departments and displayed it in the form of a bar chart, shown in the figure below. Furthermore, the Pareto principle was used, which was defined that "80% of the outcomes are controlled or decided by 20% of the activities or factors." (Jana and Tiwari, 2021) Therefore, the top four items with the highest frequencies were selected based on the Pareto principle, and they were respectively "High Customer Requirements", "Low Efficiency, High Costs (Low-Quality Work)", "Employees Turnover Rates", and "Cross-Department Communication".
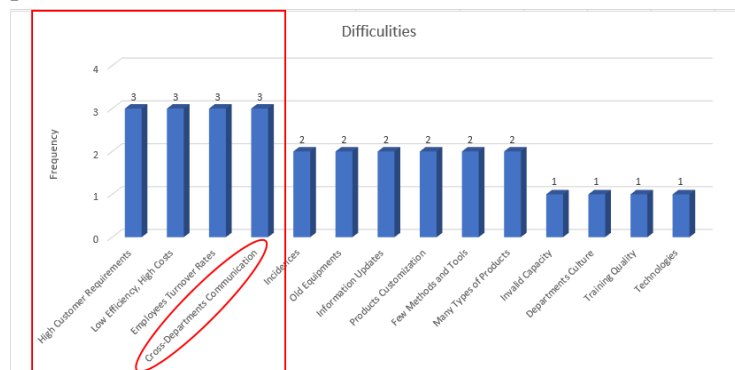

Figure 1: Identified Difficulties in the Departments

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After the second-round discussion, both the authors and these department managers agreed on conducting further analysis of the problem of "Cross-Department Communication" which was chosen because it was deemed the most frustrating of the four identified items. In addition, the authors also considered whether the inefficient cross-department communication could be alleviated with the implementation of emerging technologies and ideas in Digital Transformation, and then provided a clear vision of the specific implementation effects on the solutions to this identified problem with the relevant issues. Furthermore, even if some manufacturing companies have already implemented emerging technologies and ideas, including management, production process management, and other business management, there are few existing case studies with a detailed elaboration of what specific aspects have been influenced after the implementation of the digital transformation platforms and software with the relevant technologies and ideas in the manufacturing companies, and, specifically, there is no case study on the manufacturing company in China. It was also essential for the authors to carry out a practical case study on the existing emerging technologies and ideas implemented in the Chinese manufacturing company and provide a practical reference for future research. Therefore, this case study relies on socio-economic theory and, more precisely, the "Organizational Dysfunction" concept, starting with cross-department communication. The case also explores the further impacts of digital transformations on the cross-department communication. The research questions are defined thusly:

RQ1: What affects cross-department communication in the Chinese manufacturing company?

RQ2: What are the further impacts of digital transformation on cross-department communication?

In this paper, the authors elaborate on some existing literature reviews on Organizational Dysfunctions and SEAM theories in the Theoretical Background section. In the section on Research Methodology, the authors describe the research methodology in the case study. The case study with semi-structured interviewing and qualitative analytical results with the related software implementation is displayed in the section Data Analysis and Discussion. Finally, the authors further elaborate on the contributions to the research, research limitations and future studies, and the conclusion.

2 Theoretical Background

2.1 Organizational Dysfunctions

Savall and Zardet (2008) defined organizational dysfunctions as ones that "represent problems or difficulties that constantly disturb the life of companies. Such

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dysfunctions prevent companies from fully achieving their objectives and efficiently using their human resources and material resources." They pointed out six main dysfunction types in an organization, which are "Working Conditions," "Work Organization," "Communication/Coordination/Cooperation(3C)," "Time Management," "Integrated Training," and "Strategy Implementation." Each of the six types also contains relevant sub-categories. Furthermore, Monod and his partners (2021) generated sub-categorized items in line with the six types in their recently published conference paper "The Return on Digital Transformation: A Holistic Performance System Based on Hidden Cost Theory for Bringing Value Back to Digital Transformation Consulting", and the specific items are displayed in Table 1 below. (Copyright ISEOR – Institute of Enterprises and Organizations).

Dysfunction	Sub-categories
Work Conditions	1. Work hours and schedule 2. Physical work conditions
Work Organization	1. Distributions of tasks, missions, and functions 2. Absenteeism regulation 3. Work motivation 4. Job autonomy 5. Workload
Communication Coordination Cooperation	1. Communication/coordination within a department 2. Communication/coordination with other departments 3. Communication/coordination between headquarters and distributors 4. Communication/coordination between headquarters and branch offices 5. Communication/coordination at the level of the board of directors 6. Transmission of information within the company and with third parties 7. Vertical communication/coordination 8. Horizontal communication/coordination

Time Management	1. Deadline compliance
	2. Activity scheduling
	3. Task achievement improvement
	4. Time management improvement
Integrated Training	1. Job training adequacy
	2. Competency improvement
Strategy Implementation	1. Corporate strategy linkages
	2. Corporate strategy implementations
	3. Information systems improvement
	4. HR management improvement
	5. Overall improvement of the model of management

Table 1: Organizational Dysfunctions (Monod et al., 2021)

As the main difficulty had been found as "Cross-Department Communication," the authors matched this difficulty with the item in the tables of "Organizational Dysfunctions."

2.2   SEAM (Socio-economic Approach to Management)

Socio-economic approach to management (SEAM) is an alternative method implemented on organizational management and organizational changes. It is regarded as "An umbrella for the socio-economic theory, the SEAM change intervention, and SEAM management tools and tactics.". These three elements are much interweaved with each other, where "The theory feeds the practice, which in turn is based on theory." (Conbere and Heorhiadi, 2018). Beyond of that, they illustrated that "SEAM provides a methodical, tested way to assess the hidden costs in an organization." Meanwhile, Bonnet and Savall (2014) described the management thinking with the implementation of SEAM as "The performance results from the dynamics and quality of interaction between the different structures of the company (physical, organizational, technological, demographic and mental structures), and the behavior of the actors (at individual, team, activity group, categories, and collective levels)" The related factors would be easily perceived as low-weighted by the managers in the organization without the further consideration of SEAM (Conbere and Heorhiadi, 2011). They mentioned that "Hidden costs and poor performance come from organizational dysfunctions, which are the result of a failure to align structures and actors' behaviors properly." They had also come up with all the elements (Dysfunctions, Structures, Behaviors, Hidden Costs) in SEAM, and the relationship between elements in their research.
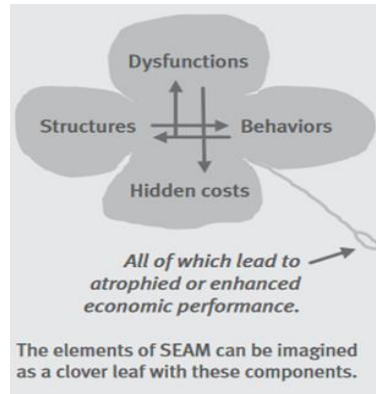
Figure 2: The Elements of SEAM (Conbere and Heorhiadi, 2011)

2.3   Information Systems Discipline

Information Systems (IS) is an academic discipline of complementary networks with dimensions involving hardware, software, users, and business processes. Davis (2006) proposed that Information Systems Discipline is connected with "the use of information and communications technology in organizations.". The authors identified this study as a practical case reference for the Information Systems Discipline in Digital Transformation.

3   Research Methodology

Due to the research question *"What affects cross-department communication in the Chinese manufacturing company?"*, the authors decided to implement qualitative methods in this study as "qualitative methods are used to answer questions about experience, meaning, and perspective, most often from the standpoint of the participant" (Hammarberg et.al., 2016). Regarding the interview categories. Semi-standardized (semi-structured) interviews provide a more flexible way of conducting the interview, and in some cases, unexpected replies and issues are permitted with the implementation of the open-ended questioning. Moreover, Ryan and his partners (2009) indicated that the researcher can utilize non-verbal cues from the observations of the interviewees through their gestures, facial expressions, and eye contact, and then the researcher is abler to understand what the interviewees want to express and detect hidden meanings. When implementing a semi-structured interview, there need to be enough people to get accurate conclusions and make further comparisons for the data analysis and interpretation. The authors also must verify the exact number of the interviewees to avoid using too much time, and DeJonckheere and Vaughn (2019) claimed that the number of participants in the interview relates to the purpose and category of the research, and the research questions are needed to be answered

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in the research. They suggested that the sample size for the interview should be decided by the objective of the research, the samples' homogeneity, the implemented theory, the quality of the interview, and the strategy of analysis. In terms of this research, the participants in this research have been chosen as the department managers because of their higher level of perspectives and wider dimensions of vision compared with the other staff in the company. Meanwhile, the theories for this research are considered as the combination of the content analysis on the digital transformation, Organizational Dysfunction, and IS Discipline, and the appropriate sample size for conducting in-depth interviews is 30 (InterQ Research LLC, 2021). However, if there was no new information when the authors conduct the further qualitative data analysis for some of the interviews, which are based on coding with the implementation of NVivo qualitative analytical software, the authors will determine to suspend the coding on the further interviews (Glaser and Strauss, 1967). Last but not least, in light of the answer to the second research question *"What are the further impacts of digital transformation on cross-department communication?"*, the authors determined to generalize the result from the further data analysis, and summarize the digital transformation influence on cross-department communication.

4   Data Analysis and Discussion

The authors carried out semi-structured face-to-face interviews with the department manager in different departments of the company. Afterward, the authors used NVivo, the qualitative analytical software, to analyze the interview content and then gathered the content into the category called a node to summarize, or capture, the essence of the content. Finally, the authors revealed the analytical results in the form of visual graphics and conducted an explanation and further discussion of them. After receiving the majority of the heads of the management committees' confirmation in each department of the company, the authors made up their minds on the interviewing candidates' selection, with the consideration of their specific departments and their years of service in the company. The authors decided to conduct the semi-structured interviews with 15 heads of the management committees, and their belonging departments are distributed separately in Logistics, Production, Production Planning and Control, Order Handling, Quality, Human Resources, Products Engineering/Computer Aid Manufacturing, and Sales. The heads were allocated into 3 rounds of interviews, and 5 nominees were arranged for each round so that the interviews could be completed in a reasonable period and could provide ample time for the subsequent data (interview content) analysis. Additionally, the researchers do consent to some general theories and principles, including no new data/themes/coding from the data analysis, and having the capability to repeat the study (Guest et al., 2006). Therefore, the authors analyzed the 15 nominees' contents at first, verified the saturation point due to the general

theories and principles, and then verified whether it was essential to invite 15 additional people in line with the 30 interviews.

R1	Name	Rock	Steven	Chen	Joey	Way
	Department	Logistics	Production - Back End	Controlling	Order Handling	Quality Engineering - DIV MA
R2	Name	Besse	Jim	Loki	Bob	Sky
	Department	Human Resource	Production Planning and Control - B&OE	Quality Engineering - Imaging	Production - FI/VP/OSP/Silver	Production - Metalization
R3	Name	Evan	Edmond	Linda	Rainbow	Chris
	Department	Production - Mechanical Drilling	Customer Quality Management - Global AQM	PE/CAM	Sales	Quality - Metalization

Figure 3: Nominees List for Semi-Structured Interviews (15 People)

Afterward, the authors carried out the interviews with questions that were categorized into two dimensions: "Current situations of Cross-Department Communication/Cooperation/Coordination in the Organization" and "Digital Transformation on Cross-Department Communication/Cooperation/Coordination in the Organization." The authors intended to conduct the interviews on these two dimensions and answer two research questions through the analytical results of the interviews. The specific interviewing questions were displayed as follows.

Current situations of Cross-department Communication/Cooperation /Coordination in the organization	Question 1: Is there any good experience with cross-department communication? If you have, can you please share the specific cases with the reasons for it?
	Question 2: Is there any bad experience with cross-department communication? If you have, can you please share the specific cases with the reasons for it?
Digital Transformation on Cross-department Communication/Cooperation /Coordination in the organization	Question 3: Do you know of any digital transformation projects that have already been planned or implemented in the company? What specific digital transformation projects have you already got in touch with from your current daily work?
	Question 4: What kinds of digital transformation role do you think that will play in the company's cross-department communication/cooperation/coordination?

Figure 4: Interviewing Questions

Subsequently, the authors implemented the NVivo software (Version: Release 1.5.2), which was extensively used for the qualitative data analysis, to code the data set of the interview contents. According to data analysis on the interviewing contents, the authors applied the thematic analysis, thematic analysis was the suitable analytical method for the research studies on investigating peoples' perceptions with

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the respects to any kind of subjects as the present study. After completing the coding of the themes from the interview content of the 15 selected nominees, the authors exported the results of coded themes into an Excel file, with the related visual charts displayed as well. Then, the authors discussed the results and verified the saturation point of the interviewee's selection by the two research questions.

RQ1: "What affects cross-department communication in the Chinese manufacturing company?" The interviewees reported both good and bad experiences in their perspectives and from the overall feedback from their colleagues in their departments, and according to their perspectives on the successful cross-department communication in the company, a proper method of prior, informal, and small-scale communication between employees on the tasks alignment (e.g. face-to-face) before the formal communications (e.g. meeting), and employees' good attitudes and professionalism, with their good responsibilities and accountabilities on their jobs, and their good work capability on both the soft skills (personal qualities that help employees thrive in the workplace), and hard skills (job-related knowledge, and abilities that employees need to perform their job duties effectively), will facilitate the smooth cross-department communication in the company. On the other hand, the employees' bad attitude and professionalism, the persistence in his/her old ways, and does not care for other colleagues in the collective work, then it will add barriers to cross-department communication. In particular, the interviewees who talked about it during the interviewing, especially mentioned that "The attitude and professionalism of the department managers can greatly affect the attitudes and professionalism of employees in his/her department." Besides that, the poor performance of information transmission tools and communication aids and tools, and unclear procedures with the vague descriptions of employees' job responsibilities in their departments, will also lead to a negative influence on the cross-department communication in the company as well. Therefore, the authors finally generated a model based on the summarized findings in the figure below.
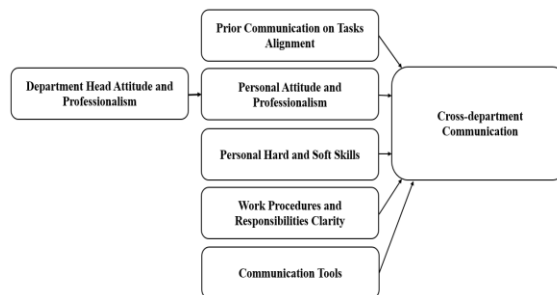

Figure 5: Factors Affecting Cross-department Communication (by the authors)

RQ2: "What are the further impacts of digital transformation on cross-department communication?" After further analysis of DT roles in cross-department

communication, the authors noticed that 80% of the nominees thought that digital transformation could generate the positive contribution to **"Timely Data Transmission"** across different departments in the company. Besides that, **"Unified Views on Organizational Objectives and Cultures"** for all the staffs in the organization and **"Flexible and Convenient Communication Environment"** were another two main items that account for higher percentages than the other 5 remaining categories. These three mentioned categories were deemed as the highest relevance of digital transformation for the impacts on the cross-department communication in the organization based on the further alignment of Pareto Principle.
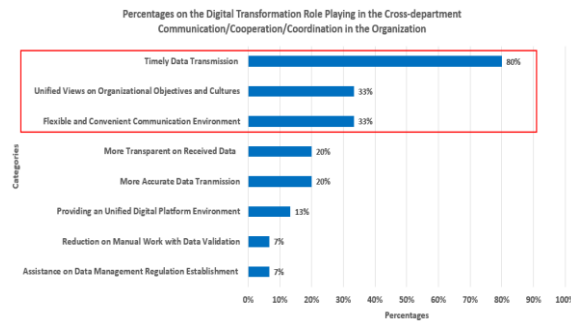

Figure 6: Digital Transformation (DT) Role Playing in the Cross-department Communication/Cooperation/Coordination

Furthermore, the authors argued that these three identified items are the further reasons of that digital transformation implementation leads to the impact of communication tool in the previous model. Therefore, the authors combined these items with the previously-generated model, and came up with an updated one.
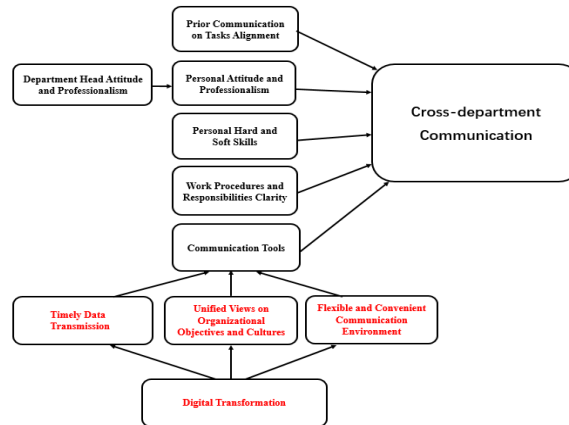

Figure 7: Further-modified Factors Affecting Cross-department Communication (by the authors)

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In addition, the authors discovered that there were no more distinctive categories after the coding of the selected 15 participants' interview contents, and the authors believed that data sampling in this study had already reached the saturation point.

5   Contributions to Research

The authors have made qualitative research, using the theory of organizational dysfunction to identify the company's business problems, and find out the important aspects affecting cross-department communication. The relationship between digital transformation and cross-department communication has been discussed. This paper provides a practical reference for the organizational management, and the authors strongly suggested that the mangers, and especially department managers in the organizations, should take their daily behaviors into account, which have some certain impacts on their subordinates working styles and attitudes. Meanwhile, as the authors discovered that digital transformation cannot completely substitute some traditional cross-department communication methods, such as face-to-face communication between people, and the authors recommended Human Resource Department can put much emphasis on recruiting, and additional assistance on training the employees with appropriate communication skills. Apart from this, the final analysis results can be used as the practice proof of the manufacturing industry.

6   Research Limitations and Future Studies

In terms of the analysis of the two research questions, the interviewees were only chosen at the levels of department managers in the selected departments in this study. It is indispensable for the researchers to take other factors like employees' position levels and varied departments into consideration in future interviews.

7   Conclusion

This paper was an attempt to describe cross-department communication organizational dysfunctions with socio-economic theory in a Chinese manufacturing company, and to evaluate digital transformation impact on cross-department communication. The study results revealed the effects discovered from digital transformation implementation, and the authors focused on the perspectives of the department managers in different departments to seek the potential root causes of the present inefficient communication between different departments in the organization. In this study, semi-structured interviewing was conducted to pursue in-depth research with multi-dimensions in the dynamic working environment. This paper recommends the use of socio-economic theory for the study of digital transformation, opening research directions in the philosophy of information systems.

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