

**THE IMPACT OF COLLABORATION REQUIREMENTS ON FIRM PERFORMANCE:
AN EMPIRICAL EXAMINATION IN TURKEY****Associate Professor Şerkan ADA**Çumra School Of Applied Sciences Department Of Management Information Systems,
Konya/Turkey**Professor Rifat IRAZ**Selcuk University, Faculty of Economics and Administrative Sciences Department of Business
Administration, Konya/Turkey**Murat KARABEN**

Selcuk University, Social Sciences Institute, Konya/Turkey

ABSTRACT

Collaboration is of great importance in today's global and challenging business environment. It goes without saying that organizations having successful collaboration efforts will be able to experience higher business value and performance. Today, collaboration in organizations is easier and more effective through the use of collaboration technologies. The objective of this study is to investigate whether or not collaboration requirements in businesses improve firm performance. In the context of this study, we use a previously developed conceptual model of collaboration, called Requirements for Collaboration Model, by Laudon and Laudon (2011) and test whether the relationships in this model empirically hold true. More specifically, we test whether collaboration capability and collaboration technology affect collaboration quality, and whether collaboration quality have an influence on firm performance. According to the results from this analysis, we empirically show that only the relationship between collaboration capability and collaboration quality is supported, while we could not find an empirical evidence in other relationships in the model.

Keywords: Collaboration capability, collaboration technology, collaboration quality, firm performance**1. INTRODUCTION**

In today's global and challenging business environment, it is of critical importance for organizations to achieve successful collaboration within the organization and with their external partners to ensure their organizational performance and competitive advantage in the marketplace (Boughzala and De Vreede, 2015:130). According to Gartner, Inc. seventy percent of high-performing companies will manage their business processes using real-time predictive analytics or extreme collaboration by 2016 (Stamford, 2013).

The word "collaboration" is based on the Latin words *com* and *laborare*, which mean "to work together". Collaboration is defined as "a process in which two or more agents (individuals or organizations) share resources and skills to solve problems so that they can jointly achieve one or more goals" (Boughzala and De Vreede, 2015:133). It is defined by Laudon and Laudon (2011) as "working with others to achieve shared and explicit goals". Puybaraud and Kristensen (2011) define collaboration as "value-adding interactions that enable employees, customers, suppliers and partners to achieve business objectives, make good decisions, resolve issues and share knowledge effectively and efficiently".

In fact, collaboration is one of the most critical components of the organizational life and processes. In organizations, people have to work together to create value due to the fact that they cannot produce by themselves. When collaborative efforts become successful, organizations are able to realize the productivity and profitability (Boughzala and De Vreede, 2015).

Collaboration is easier and more effective today with the help of the collaboration technologies. Collaboration technologies are defined as “combinations of technology, people and organizations that facilitate the communication and co-ordination necessary for a group to work together effectively” (Ramage, 1999). The literature with respect to the collaboration technologies is very scarce. Dulipovici and Vieru (2015) examine how a collaboration technology is used by three organizational groups. Their findings reveal a process model which shows social dynamics and users’ perceptions of the capabilities of the collaboration technology to share the users’ knowledge influence the users’ behavior. In another study, it is argued that the investments on collaboration technologies provide many benefits for the business operations, including but are not limited to, sales, marketing, research and development. The findings of their study reveal that collaboration technologies improve the organization more than four times of investment (Verizon, 2009). Aral et al. (2007) identify that the total economic benefit of collaboration is of great significance. They stress that an additional revenue of \$70 is generated for every word seen by an employee in e-mails sent by other people. Another study on collaboration technologies show that collaboration technologies positively influence meeting output as well as meeting satisfaction (Reinig, 2003). On the other hand, collaboration technologies alone is not adequate for a successful collaboration. Laudon and Laudon (2011) articulates that successful collaboration requires an appropriate organizational structure and culture, along with appropriate collaboration technology.

The objective of the current study is to investigate whether or not collaboration requirements in businesses improve firm performance. For this purpose, we take the advantage of a previously developed conceptual model of collaboration, called *Requirements for Collaboration Model*, by Laudon and Laudon (2011: 58) and test whether the relationships in this model empirically hold true. More specifically, we test whether collaboration capability and collaboration technology affect collaboration quality, and whether collaboration quality have an influence on firm performance.

The paper is organized as follows. In the next section, research model is presented along with the research hypotheses. Then, the research methodology, including sampling procedure, data collection as well as the data analysis, is detailed. In the subsequent section, the findings of the current study is presented. Finally, The paper ends with the conclusion section.

2. RESEARCH MODEL AND HYPOTHESES

In their conceptual model related to collaboration (a.k.a. *Requirements for Collaboration Model*), Laudon and Laudon (2011: 58) articulate how collaboration is believed to affect firm performance (Figure 1).

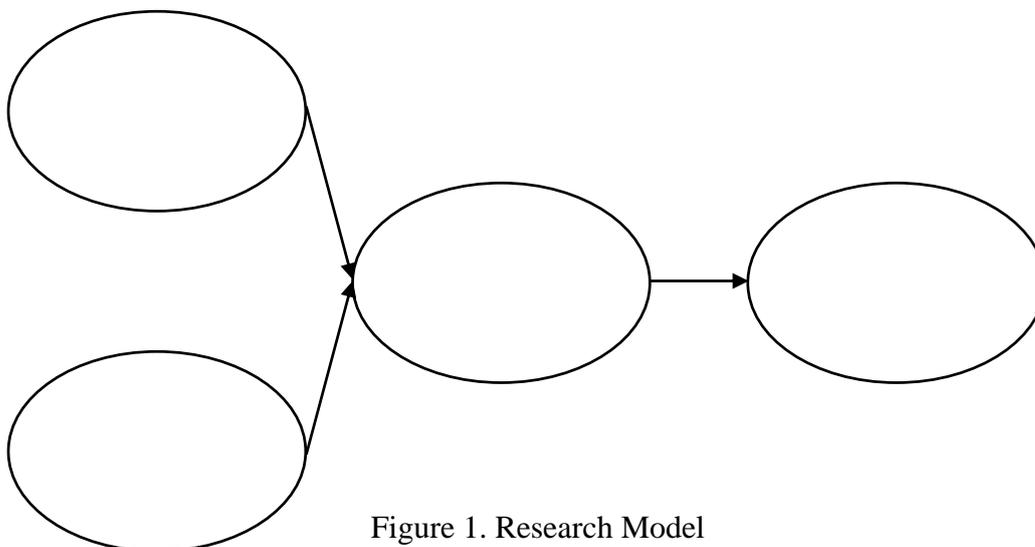


Figure 1. Research Model

Source: *Requirements for Collaboration Model* (Laudon and Laudon, 2011: 58)

Collaboration capability requires top management of a firm to create a teamwork, communication, interaction, and collaboration environment not only among the employees but also among the business units. It also enables the organization to realign new information and technologies into the business processes. Collaboration technologies include many recent technologies and tools for voice conference, video conference, web conference, online document/file creating, sharing, and storage, screen/desktop sharing, online calendar and planning for meetings and events, e-mail, social media, etc. These two factors (i.e., collaboration capability and collaboration technology) enable a quality collaboration. Collaboration quality, in turn, positively influence firm performance, which includes, profitability, profit increase, sales increase, employee productivity, product development, product quality, customer satisfaction, and innovation (Laudon and Laudon, 2011: 58).

Considering the relationships in the *Requirements for Collaboration Model*, we suggest and test the following hypotheses:

Hypothesis 1: Collaboration capability is positively related to collaboration quality.

Hypothesis 2: Collaboration technology is positively related to collaboration quality.

Hypothesis 3: Collaboration quality is positively related to firm performance.

3. RESEARCH METHODOLOGY

3.1. Sample and Data Collection

In order to test the hypotheses in the *Requirements for Collaboration Model*, we conducted a structured survey to the business managers and employees of a company located in Istanbul, Turkey. The initial version of the survey was developed based on previous literature (Gofus et al., 2006; Laudon & Laudon, 2011) as well as the feedback received from the business managers. The final version of the survey included a section devoted to the demographic information and four sections with respect to the measures of the research model (i.e., collaboration capability, collaboration technology, collaboration quality, firm performance).

The survey was conducted in the aforementioned company in June 2016. 48 managers and employees at various levels in this company participated in the survey. A detailed profile of the survey responders and their demographical information is provided in Table 1.

As can be seen in the following table, 29,2% of the survey responders are female, whereas 70,8% of the responders are male. 64,6% of the survey responders are married, while 35,4% of the sample is single. The majority of the sample (60,4%) is composed of people aged 30 to 39, with 10,4% of the sample between 20 to 29, with 27,1% of the sample between 40 to 49, while 2,1% of the sample is between 50 to 59 years. 93,7% of the survey responders holds an undergraduate or higher degree, while the remaining responders hold a high school or vocational school degree. Of the survey responders, 56,3% is the unit supervisor or representative, while 29,2% is general director or director in the company. Other responders are working as an employee or in other positions. In the sample, the majority of the survey responders (62,6%) have been working in the current company between one and ten years, while 6,3% have less than one year of working experience in the current company. 10,4% of the responders have 11-15 years, 8,5% have 16-20 years, and 12,5% have more than 20 years of experience in the current company. Finally, according to the demographic findings, 74,1% of the survey responders have more than ten years of total working experience, while 35,4% have 6-10 years, and 10,4% 1-5 years of total working experience.

Table 1. The Profile of Survey Responders

Demographic variables		N	%
Gender	Female	14	29,2
	Male	34	70,8
Marital status	Married	31	64,6
	Single	17	35,4
Age	20-29	5	10,4
	30-39	29	60,4
	40-49	13	27,1
	50-59	1	2,1
Education level	High school	2	4,2
	Vocational school	1	2,1
	Undergraduate	35	72,9
	Master's	10	20,8
Working position	General director	2	4,2
	Director	12	25,0
	Unit supervisor	24	50,0
	Unit representative	3	6,3
	Employee	6	12,5
	Other	1	2,1
Work experience in the current company	< 1 year	3	6,3
	1-5 years	15	31,3
	6-10 years	15	31,3
	11-15 years	5	10,4
	16-20 years	4	8,3
	> 20 years	6	12,5
Total work experience	< 1 year	0	0,0
	1-5 years	5	10,4
	6-10 years	17	35,4
	11-15 years	10	20,8
	16-20 years	6	12,5
	> 20 years	10	20,8

N = 48

3.2. Data Analysis

In order to test the measurement and structural models, Structural Equation Modeling (SEM) was used. To evaluate the psychometric properties of the measurement scales and to test the hypotheses in the research model, the component-based partial least squares (PLS-SEM) approach was used. The PLS-SEM approach was selected because it is well suited for predicting data and for exploratory research models. This approach is also very suitable when the distribution of the data is non-normal. The SmartPLS software package (Version 2.0.M3) was used to estimate the parameters of the research model (Ringle et al., 2005).

Cronbach's Alpha values were examined for doing the reliability analysis of all of the measurement items in the research model. In order to ensure the reliability of measurement items, Cronbach's Alpha values should be higher than 0,70 (Gefen and Straub, 2005; Nunnally, 1978). The results are presented in Table 2. According to the results from the reliability analysis done by SmartPLS software, Cronbach's Alpha value of *Collaboration Capability (CAP)* scale is 0,83; Cronbach's Alpha value of *Collaboration Technology (TEC)* scale is 0,86; Cronbach's Alpha value of *Collaboration Quality (QLT)* scale is 0,88; and Cronbach's Alpha value of *Firm Performance (FPR)* scale is 0,96. In addition, in accordance with the recommendations of Fornell and Larcker (1981), the average variance

extracted (AVE) for each measure exceeds the value of 0.50. These findings confirm that the scales of the research model constructs have adequate reliability assessment.

Table 2. AVE and Cronbach's Alpha Values

	AVE	Cronbachs Alpha
Collaboration Capability (CAP)	0,54	0,83
Collaboration Technology (TEC)	0,52	0,86
Collaboration Quality (QLT)	0,69	0,88
Firm Performance (FPR)	0,76	0,96

Table 3 reports results of testing the discriminant validity of measurement scales. Discriminant validity of the scales is supported because the bolded elements (square roots of AVEs) in the matrix diagonals are greater in all cases than the off-diagonal elements in their corresponding row and column.

Table 3. The Results of Testing the Discriminant Validity

	CAP	TEC	QLT	FPR
Collaboration Capability (CAP)	0,73			
Collaboration Technology (TEC)	-0,23	0,72		
Collaboration Quality (QLT)	0,65	-0,20	0,83	
Firm Performance (FPR)	-0,07	0,29	0,17	0,87

Convergent validity of the scales was tested using SmartPLS by extracting the factor loadings and cross loadings of all the measurement items to their respective constructs. The results are provided in the following table (Table 4). The results presented in Table 4 show that measurement item loadings on the intended constructs were at a satisfactory level and were at least 0.10 less on their loadings on other constructs (Gefen and Straub, 2005). In addition, each item's factor loading on its respective construct was highly significant ($p < 0.001$). Therefore, the loadings and cross-loadings of the measurement scales confirm the convergent validity of the measures for research constructs.

4. RESULTS

The results from testing the structural model reveal that *Collaboration Capability* is positively related to *Collaboration Quality* ($\beta = 0.64, p < 0.05$) (Figure 2). The results also show that no statistically significant relationship exists between *Collaboration Technology* and *Collaboration Quality* ($\beta = 0.05, p > 0.05$), and *Collaboration Quality* and *Firm Performance* ($\beta = 0.16, p > 0.05$). R^2 value of *Collaboration Quality* is at an acceptable level ($R^2 = 0.43$), while R^2 value of *Firm Performance* is very low ($R^2 = 0.03$). Therefore, we conclude that Hypothesis 1 is supported, but Hypothesis 2 and 3 are rejected.

Constructs/measures	CAP	TEC	QLT	FPR
<i>Collaboration Capability (CAP)</i>				
Top management should create an environment supporting the teamwork and collaboration.	0,61	0,14	0,42	-0,07
Top management should be supportive for the collaboration.	0,83	-0,07	0,42	-0,09
Top management should support the sharing and interaction among the employees.	0,81	-0,30	0,63	-0,05
Employees should be able to easily communicate with the other employees inside the firm.	0,71	-0,34	0,41	-0,01
New information and technologies should be realigned into the business processes.	0,58	-0,18	0,27	-0,10
There should be a continuous collaboration among the business units.	0,81	-0,21	0,59	-0,02
<i>Collaboration Technology (TEC)</i>				
Voice conference (Google Hangouts, Skype)	-0,27	0,92	-0,22	0,28
Video conference (Google Hangouts, Skype)	-0,20	0,94	-0,17	0,30
Web conference (Google Hangouts, Mikogo)	-0,15	0,89	-0,12	0,16
Online document/file creating and sharing (Google Documents)	0,00	0,49	0,04	0,02
Online document/file storage (Google Drive, Dropbox)	-0,01	0,58	-0,07	0,12
Screen/desktop sharing (Skype)	0,05	0,37	-0,05	-0,02
Online calendar and planning for meeting, event, etc. (Google Calendar)	-0,20	0,63	-0,13	0,26
<i>Collaboration Quality (QLT)</i>				
Collaboration is needed for carrying out the businesses among the business units.	0,66	-0,20	0,85	0,07
Collaboration is needed for carrying out the businesses with outside partners and stakeholders.	0,49	-0,20	0,79	0,14
Collaboration is needed to successfully complete a certain task.	0,30	0,04	0,65	0,25
Business strategy should be supportive of collaboration efforts.	0,65	-0,18	0,90	0,12
A collaborative environment for team coordination should be established.	0,52	-0,22	0,93	0,18
<i>Firm Performance (FPR)</i> (There is a positive effect of collaboration on ...)				
... profitability ratio.	-0,04	0,26	0,14	0,93
... profit increase.	-0,03	0,29	0,15	0,91
... sales increase.	-0,14	0,22	0,13	0,89
... employee productivity.	-0,04	0,34	0,17	0,90
... the product development.	-0,10	0,23	0,16	0,94
... the product quality.	-0,05	0,22	0,06	0,85
... customer satisfaction.	-0,13	0,25	-0,05	0,70
... innovation.	-0,14	0,25	0,02	0,85

Table 4. Factor Loadings and Cross-loadings

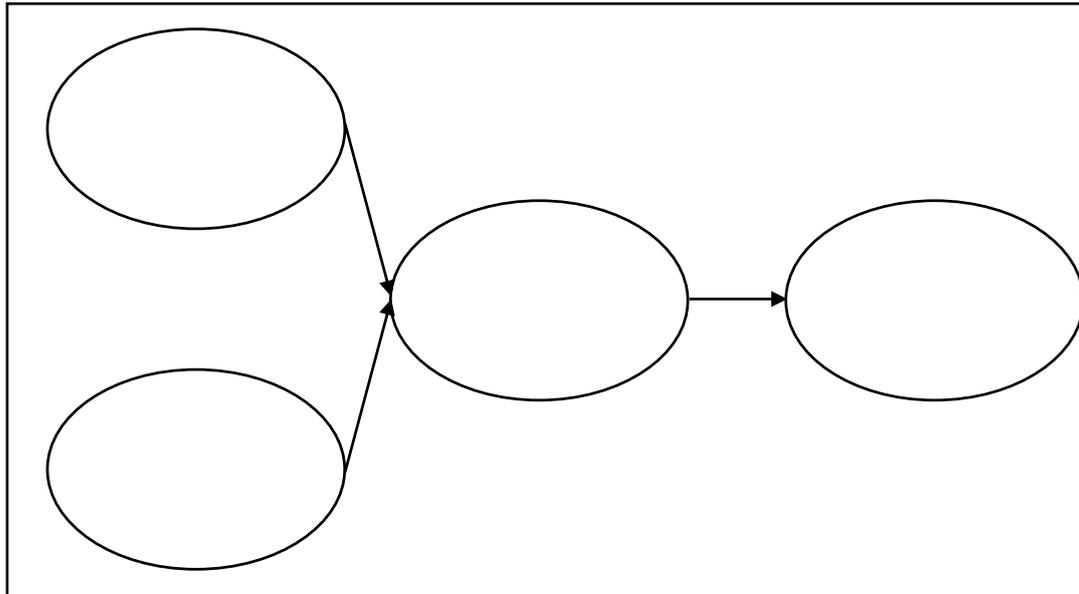


Figure 2. Structural Model Results

* $p < 0,05$; NS: Not Significant

Source: *Requirements for Collaboration Model* (Laudon and Laudon, 2011: 58)

5. CONCLUSION

Collaboration, in today's contemporary and dynamic businesses, is of great importance for the global business world. It is one of the most important and critical factors of the effectiveness of the organizational processes and tasks. Collaboration enables people to work together to be more productive, and in turn leads to a better and improved firm performance.

In this study, we examined the impact of collaboration on firm performance by examining the collaboration requirements. Laudon and Laudon (2011) argues that collaboration capability and collaboration technology enable a quality collaboration, and in turn lead to impact the firm performance. This model is named as *Requirements for Collaboration Model*. In the context of the current study, we utilize from this model and relationships in this model, and investigate the impact of the collaboration requirements on firm performance. More specifically, we test whether collaboration capability and collaboration technology affect collaboration quality, and whether collaboration quality have an influence on firm performance.

The findings of this study reveal that collaboration capability have a positive influence on collaboration quality, while there is no significant relationship between collaboration technology and collaboration quality as well as collaboration quality and firm performance. Therefore, we conclude that, while these relationships may be theoretically and conceptually valid, they do not empirically hold true. As a conclusion, researchers in the future are suggested to look at the collaboration requirements model from different perspectives and modify the model by introducing other mediator and/or moderator variables in the model in order to better explain it.

REFERENCES

- Aral, S., Brynjolfsson, E., and Van Alstyne, M. (2007). Productivity effects of information diffusion in networks. MIT Center for Digital Business, July 2007.
- Boughzala, I. and de Vreede, G. (2015). Evaluating team collaboration quality: The development and field application of a collaboration maturity model. *Journal of Management Information Systems*, 32(3), 129-157.

- Dulipovici, A. and Vieru, D. (2015). Exploring collaboration technology use: How users' perceptions twist and amend reality. *Journal of Knowledge Management*, 19(4).
- Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 48,39-50.
- Gefen, D. and Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the AIS*, 16,91-109.
- Gofus, N., Conway, S., Kostner, J., and Cotton, B. (2006). Meetings around the world: The impact of collaboration on business performance. Frost and Sullivan.
- Laudon, K. C. and Laudon, J. P. (2011). *Management information systems: Managing the digital firm* (12th ed.). New Jersey: Prentice Hall.
- Nunnally, J.C. (1978). *Psychometric theory*(2nd ed.). New York: McGraw-Hill.
- Puybaraud, M. and Kristensen, K. (2011). Collaboration 2020: Hype or competitive advantage? Johnson Controls, Available at http://www.profacility.be/piclib/biblio/PDF_00000543UK.pdf (Accessed on December 5, 2016).
- Ramage, M. (1999). The learning way: Evaluating co-operative systems. Ph.D. dissertation, University of Lancaster, Available at <http://systems.open.ac.uk/objects/magnusr/learningway.pdf> (Accessed on December 10, 2016).
- Reinig, B. A. (2003). Toward an understanding of satisfaction with the process and outcomes of teamwork. *Journal of Management Information Systems*, 19(4), Spring 2003.
- Ringle, C., Wende, S., and Will, A. (2005). SmartPLS 2.0 (M3) Beta, Available at: www.citeulike.org/user/tilljwinkler/article/10083551 (Accessed on December 5, 2016).
- Stamford, C. (2013). Gartner says by 2016, 70 percent of the most profitable companies will manage their business processes using real-time predictive analytics or extreme collaboration. Gartner, Inc., Available at <http://www.gartner.com/newsroom/id/2349215> (Accessed on December 10, 2016).
- Verizon. (2009). Meetings around the world II: Charting the course of advanced collaboration, White Paper, Frost and Sullivan, Available at http://www.verizonenterprise.com/resources/whitepapers/wp_meetings-around-the-world-ii_en_xg.pdf (Accessed on December 5, 2016).