

The Mediating Effect of Collaborative Structure and Competitive Intensity on the Relationship between Process Management and Organizational Performance

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Abstract

Taking the highly competitive markets into consideration, organizations need to be involved in activities that yield not only high performance, but also a competitive advantage. The present study was conducted to investigate the effect of collaborative structure and competitive intensity in the relationship between process management and organizational performance in Shiraz Municipality. The present research is practical and descriptive-survey in terms of research objective and nature, respectively. Moreover, our statistical population in this research was composed of 80 experts, executive managers, and administrative assistants in Shiraz Municipality. A total of 67 municipal executive managers and experts was selected as the research sample using simple random sampling method and Morgan table. Additionally, a questionnaire with five-point Likert's scale was employed. Furthermore, Cronbach's Alpha coefficient was utilized to evaluate the reliability of the questionnaire, the value of which equaled 0.91. The research hypotheses were examined by statistical methods, namely, descriptive statistics, confirmatory factor analysis, structural equations, and one-sample *t*-test. The results indicated that process management has a positive and significant effect on organizational performance due to the mediating role of competitive intensity. It was also concluded that process management positively influences organizational performance due to the mediating role of collaborative structure. Likewise, the research main hypothesis was also confirmed.

Keywords

Process management, Organizational performance, Competitive intensity, Collaborative structure.

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Introduction

In today's highly competitive business environment, unless an organization possesses mechanisms required for gaining immediate knowledge of changes and the ability to deal with them quickly, it will not grasp the opportunity to remain in the realm of competition (Yarmohammadian et al., 2012). To be prepared for the difficult competition, organizations and companies ought to persuade themselves of the squeezing need of optimizing its competing elements. (Azzemou & Noureddine, 2018). One of the foremost, vital management destinations has always been maintaining competitive advantage in the long term (Prajogo et al., 2108). Organizational performance alludes to how well a firm or a company reaches its economic and market-oriented objectives. Process management is extensively known as an imperative approach in maintaining competitive advantage as well as improving organizational performance. (Pradabwong et al., 2017).

Organizations have come to the conclusion that a functional approach to business hampers flexibility and dynamics (Ota et al., 2013). As it is well admitted in the literature, process management plays a crucial role in enhancing different aspects of a product, including its effectiveness, efficiency, flexibility, and quality. As a management approach strategy, process management is concerned with the adopted policies, approaches, and practices in coordinating and managing the organizations' processes (Prajogo et al., 2108). Process management is concerned with the design, execution, monitoring, and improvement of business processes (Mendling et al., 2018). Process management studies have been merely focused on the limited boundary of organizations. The results of a various number of these studies were indicative of the positive impact of BPM on organizations' performance, whereas other studies were designed to investigate the concepts of *process* in BMP such as the elements and the relationships between them and the performance of the organization and customers' satisfaction (Pradabwong et al., 2017). To maintain a collaborative relationship in the supply chain, some extent of communication, trust, mutual dependence, and information sharing among supply chain members is required (Chong & Zhou, 2014). Empirical studies have yet to test how the competitive dynamic

situation and collaboration, faced by a company, balanced the innovation and productivity; therefore, we pursued to fill up this gap and improve the literature in aspects such as competitive pressure, trust, information sharing, process improvement, process design, and process control. Operational performance, both in internal and external aspects, can be seen as a gap in the current literature. However, the latter, that is external ones, for instance innovation, have been widely observed in the literature as the sources of competitiveness in sales and profit. Therefore, considering the above-mentioned gap, the present study sought to investigate the influence of collaborative structure and competition intensities on the relationship between an organization's performance and process management. This study, conducted in the form of testing a conceptual model, aimed to investigate the effect of competitive intensity and collaborative structure on the relationship between process management and organizational performance at of the Shiraz Municipality in Iran.

The Research Theoretical Foundations

Organizational Performance

Performance evaluation during this period, mostly focused upon individuals and organizational structure. In the sixties and seventies, organizations addressed new methods to evaluate their performance. Researchers such as Lebas and Euske presented a series of definitions to shed more light on the concept of organizational performance: it refers to a set of financial and non-financial indexes which provide information on the basis of the level at which results and goals are achieved.

Among the types of outcomes, the terms product innovation and process innovation have been used to characterize the appearance of a new or improved good and/or service as well as improvements in the manner in which goods and services are produced (Moyano et al., 2018). Likewise, several researchers have defined a variety of organizational performance dimensions. Sanders Jones and Linderman (2014) express performance dimensions as: 1) innovation ; 2) productivity. Innovation is the process that connects new ideas to new processes and products and requires organizations to go beyond learning from repetition, defect correction, and a desire for reducing

process variation; investigations which lead to a finer comprehension of causation that is not clear through reiteration. Experimenting and adaptable routines are recognized as the keys of learning that can result in the productivity and innovation enhancement (Sanders Jones & Linderman, 2014).

The relationship between input and output quantity adopted to develop output is productivity. Hence, productivity is the organizations' effectiveness and efficiency measurement in producing output out of the available resources. Setting a powerful basis of efficiency and productivity, companies and firms are able to increase the essential mechanism and processes in gaining and maintaining long-term virtue. As Randhawa and Sethi (2017) asserted, administering systematic organizations' efficiency is a prerequisite for firms and companies to gain a trade advantage and maintaining a comprehensive productivity and efficiency estimation is, thus, a significant communication, instrumentation for sharing current organization's performance related to the created aims and/or standards of the organizations. Furthermore, efficiency and productivity estimation can be helpful in finding and improving the staff and managers' needs in order to further enhance the workforce abilities. SMEs, adopting a productivity estimation mechanism, can calculate and manage the qualitative and quantitative efficiency outcomes so as to achieve a comprehensive insight of the long-term productivity improvement (Randhawa & Sethi, 2017).

Process Management

Process refers to a set of related activities to achieve a certain goal. It is also regarded as a group of intra-organizational activities which seek to meet a common goal and can produce a certain output from certain inputs (Ghoreyshi & Safarzadeh 2011). In accordance with the Hammer's theory (2010), process management is a work with two thinking records and roots: Six Sigma quality management and business process reengineering.

In Business Process Management (BPM) community, a process is generally described as a set of tasks which are performed under certain conditions and produce a particular output. Processes are an organization's strategic asset (Smart et al., 2009). Furthermore, Von Rosing et al. (2014) maintains that, from the perspective of managerial

approach, BPM considers processes as an organization's strategic asset which should be understood, managed, and improved so as for the organization to provide customers with products and services with added value. Process management is a systemic and structured approach that companies accept to analyze, improve, and control their processes (Rezaie et al., 2009). Considering methods introduced to enhance the effectiveness of BPM, the study normally focuses on an exact implementation of process rather than productivity in its initial phase (Bae et al., 2014). Likewise, Sanders Jones and Linderman (2014) maintain that process management is described as design, control, and improvement processes. To quality gurus like Deming and Juran, process management is useful and effective for organizations all over the world. It is a management practice that emphasizes on efficiency enhancement. Consequently, it hampers an organization's ability to concentrate on innovation through the exploration.

Competitive Intensity

The power of the competition reflects a situation of competitiveness among organizations within the same industry (Adomako et al., 2017). Competitiveness is an organization's capacity to implement necessary strategic changes which are based on shareholder and customer's values and financial power as well as other factors in order to win the competition (Antony & Bhattacharyya, 2010). A greater number of companies have referred to the crucial role that cooperation with suppliers and customers play in the field of competition. In case some of the favorable measures are accessible, all companies will benefit in the supply chain. Performance of supply chain, such as cost and quality, services, delivery, reliability as well as responding to the constant changes in the market have been among the realm of studies (Zhao, 2015).

The business environment is increasingly competitive and companies seek various innovative tools in order to decrease costs and meet customers' needs (Bae et al., 2014). Competitive intensity refers to the effect a company has on the survival chances of other ones (Barnett, 1997). It indicates that depending on their resources and attempts, companies within an industry enjoy different competitions. Stronger competitors, in return, to the actions put in practice by a

company, reinforce their competitive intensity (Ang, 2008). Thus, competitive intensity is the essential feature at the center of the industrial and market structure, as well as the performance and guidance in a company (Chen et al., 2015). It is also defined as a situation in which competition is intense, given the presence of various competitors and the lack of opportunity to develop more (Chen et al., 2012). Therefore, competitive intensity is one of the main features in the structural core of business and industry, company products, and performance (Chen et al., 2015). A plethora of researches on the effect of competition has revealed that even though levels of competition can provide the pressure needed for greater productivity, high levels almost always lead to a reduction in profitability (Ang, 2008).

Collaborative Structure

A variety of factors work collaboratively to reach goals, the achievement of which is difficult or impossible by mere one factor in organizations. Their cooperation can resolve the issues by sharing and distributing the resources, data and, or expertise. However, this factor collaboration and involvement to obtain coordination can be complicated, particularly when the number of factors rises in an organization. In particular, the odds are that the factors clash with each other in administrative measures and/or on sharing resources (Hayness et al., 2014).

Cooperation is the way that allows companies to overcome resource limitations and compensate for competitive pressure, consequently causing different aspects of companies to develop (Ang, 2008). Therefore, it is plausible that the resources demand to support improvement and win competitions influences the possibility of collaboration as well as its output. Our perception of the effects adds to our knowledge about the impacts of information and collaborative sharing outputs. Most studies, conducted on the relationship between competition and collaboration structure, have focused on competition at industrial levels in such a way that a company's analysis of competing influences is seldom seen (Singh & Mitchell, 2005). Through collective cooperation, suppliers, who do not possess the power to compete on their own, can combine their competitive advantages and main capabilities in the form of supply chain to

provide better services so as to survive in the market. Competitive pressure, trust, information sharing and environmental uncertainty are selected by Chong and Zhou (2014) to compute common structure. The first one is an external factor that pushes the organizations through adopting modern technologies.

Research Methodology and Hypothesis

The research hypotheses were examined by statistical methods, namely, descriptive statistics, confirmatory factor analysis, and structural equations. In the social, behavioral, and health sciences cannot be observed directly many significant attributes. Samples of suchlike trait contain bliss, dejection, uneasiness, cognitive and social competence, and so on. They are regularly measured by various indicators that are mostly subject to the estimated mistakes. A major tool for examining and realizing relations between latent variables is Structural Equation Modeling (SEM). Existing SEM techniques are expanding using asymptotics, assuming a vast number of observations and a small number of factors (Deng et al., 2018). Among the most popular adopted fit indices in SEM are the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). Fit indices are very much different from the estimation method. And a plenty of studies measuring cutoffs are designed and conducted on the basis of the estimation of normal theory maximum likelihood (ML).

In the model, the ML RMSEA is given by

$$RMSEA_{ML,n} = \sqrt{\max\left(0, \frac{F_{ml,n}}{df} - \frac{1}{n}\right)} \sqrt{\max\left(0, \frac{T_{ml} - df}{n \cdot df}\right)}$$

In this equation, F_{MLn} indicates the minimum of the ML fit function, df resembles degrees of freedom, n is the sample size, and $T_{ML} = nF_{ML}$, n is the ML test statistic. As the sample size grows larger, the sample estimate approaches the following population value:

$$RMSEA_{ml} = \sqrt{\frac{F_{ML}}{df}}$$

where F_{ML} is the ML fit function minimum in the population (Savalei et al., 2018). Figure 1, formed from the relationship between

the research four components, depicts the research conceptual model. The main variables of the present study include organizational performance whose two main aspects, namely, productivity and innovation are addressed here; process management whose main aspects, namely, process control, process improvement, and process design are dealt with; and competitive intensity which consists of four aspects including competitors' movements, competitive pressure, paying attention to competitors and competitive conditions. Likewise, the other major variable emphasized in the present study is the collaborative structure which is composed of three information sharing, trust, and competitive pressure aspects. They are adopted from Chong and Zhou's article (2014) as presented in Figure 1.

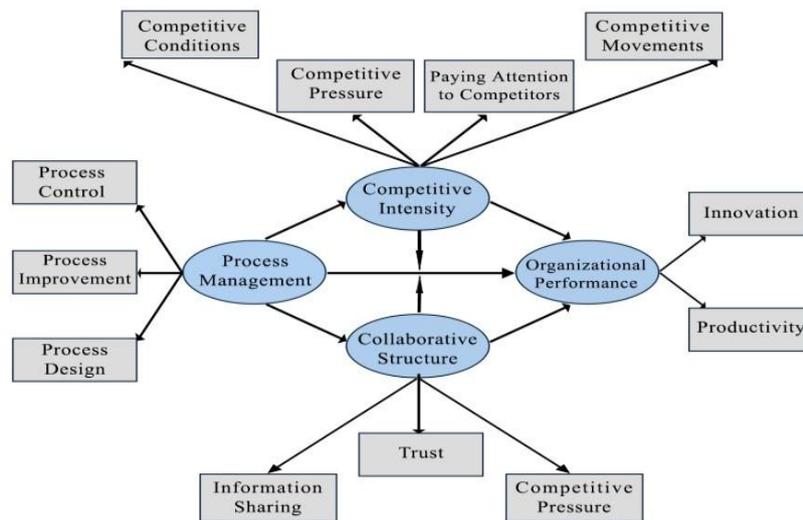


Fig. 1. The Research Conceptual Model

Companies, when maneuvering in the exceedingly competitive environment, need to adopt and execute highly efficient and productive management inventions. constantly producing and frequently improving existing operations can lead to the growth of efficiency and productivity. However, as competition increments, these elements of process control and process improvement become even more incumbent. It is less probable that an organization preserves its efficiency, enhances processes to superior ones, and

utilizes better tools and hi-tech equipment if it slips up to pursue these operations. Companies, in a competitive environment, might be forced to follow new processes or design them in a different way in a more regular basis so as to be able to keep pace with rapid changes (Donaldson, 2006). The competition consists of four aspects, namely, competitive movements, paying attention to competitors, competitive pressure, and competitive conditions, of which competitive pressure has the greatest impact on competitive intensity. In order for an organization to be able to compete, it should manage its costs, improve its quality, innovation, productivity, or deliver its product faster and at an exact time:

H1: Process management positively influences competitive intensity.

H2: Competitive intensity positively influences organizational performance.

If any organization wants to achieve high levels of information sharing, it should provide the necessary grounds like technical ones, as a result of which it will be able to play a more effective role in coordinating its various parts. Through collective cooperation, suppliers, who do not possess the power to compete on their own, can combine their competitive advantages and main capabilities in the form of supply chain to provide better services so as to survive in the market. Furthermore, in doing so, organizations utilize each other's experience, leading to increases in their efficiency, and maneuver power against environmental threats. So, it can be said that companies and organizations participate in the supply chain for two main reasons: 1) the need for using competitive advantage of other competitors, and 2) the need for efficiency, productivity and innovation through sharing resources with other competitors (Shafie & Tarmast 2014). Dobbels et al. (2014) contend that despite collaborative structure, the effectiveness, performance, innovation and coordination in servicing increases whereas the segmentation of servicing reduces. As a result, the following hypotheses are expected:

H3: Process management positively influences collaborative structure.

H4: Collaborative structure positively influences organizational performance.

Von Rosing et al. (2014) and Rummeler and Brache (2012) assert that BPM refers to managing a group of stages a business implements

so as to produce and provide products and services. Moreover, Marlon Dumas et al. (2013) in an article entitled *Fundamentals of Business Process Management* claim that BPM is the art and science of how work should be performed in an organization in order to ensure consistent outputs and to take advantage of improvement opportunities. Constantly improving process that decreases mistakes, variance, cost, and cycle time can lead to the growth of efficiency and productivity (Juran and Godfrey, 1999). High-tech innovation performance needs compatibility and is the upshot of favorably adjusting processes and products to the environment variations (Baker & Ahmad, 2010). So, hypothesis 5 can be written as:

H5: Process management positively influences performance.

The research conducted by Katz and Kahn (1978) highlights the significant effect of the environment and its impact on companies design and operation. Organizational efficiency is tied with the proper fit of the structure, the operations, as well as the environment of the company. The theory regards the coordination of the organization and the environmental context as an essential aspect of being useful (Van de Ven and Drazin, 1985). The existent innovation, operation, and efficiency are not proper anymore, and the organizational performance may not be in advantage condition in a dynamic situation. Companies, in a competitive environment, might be forced to follow new processes or design them in a different way in a more regular basis so as to be able to enhance their desired function (Donaldson, 2001). All components of managing the process can be supportive in gaining effectiveness and innovation; however, the importance of the gaining is subject to the environment such as collaboration, information sharing, trust, and competitive pressure. Achieving competitive preferences in various aspects including cost, services, quality, innovation, delivery, and flexibility in companies and organizations in profoundly competitive situations is not an easy task to do.

H6: Process management positively influences organizational performance due to the mediating role of competitive intensity. Thus, hypothesis 7 can be expressed as:

H7: Process management has positive impacts on the organizational performance due to the mediating role of collaborative structure.

Main Hypothesis:

H8: Process management positively influences organizational performance due to the mediating role of collaborative structure and competitive intensity.

The present study is practical and descriptive-survey in terms of research objective and nature, respectively. The research statistical population consisted of 80 experts, employees, and administrative assistants of Shiraz Municipality. A total of 67 municipal experts and executive managers was selected as the research sample using simple random sampling method and Morgan table. Moreover, to collect the necessary data, a questionnaire with five-point Likert's scale was employed. To examine the reliability of the questionnaire, Cronbach's Alpha was used and its value equaled 0.91. Table 1 presents Cronbach's Alpha coefficients for the above-mentioned subscales. Alpha is an important concept in the evaluation of assessments and questionnaires. It is mandatory that assessors and researchers estimate this quantity to add validity and accuracy to the interpretation of their data. Acceptable values of alpha, ranging from 0.70 to 0.95, were reported previously.

Table 1. Cronbach's Alpha Coefficients for Research Subscales

Scale	Cronbach's Alpha
Process Management	0/90
Collaborative Structure	0/73
Competitive Intensity	0/86
Organizational Performance	0/79
Total	0/91
IJMS	Table 1 Cronbach's Alpha

As mentioned above, Cronbach's alpha coefficients are higher than 0.7 for all variables in all the four dimensions.

Results

Before testing the research hypotheses, components related to the research conceptual model were examined using confirmatory factor analysis. Results concerning second phase confirmatory factor analysis for each one of the research main variables, namely, process management, collaborative structure, and organizational performance

in both standard estimate and significance level states are separately presented in Figs. 2, 3, and 4. Confirmatory factor analysis (CFA) is a sub discipline of an SEM that is a wider theory of variable analysis.

The factor loading of each item in the questionnaire with sub-items as well as the relationship between process management and its sub-variables can be seen in Fig. 2. As can be observed, factor loading is optimal and higher than 0.3. Therefore, a strong relationship between process management and process designation, process improvement, and process control is observed.

The factor loading of each item in the questionnaire with sub-items as well as the relationship between collaborative structure and its sub-variables can be seen in Fig. 3. As can be observed, factor loading is optimal and higher than 0.3. Therefore, a strong relationship between collaborative structure and information sharing, trust, and competitive pressure is observed.

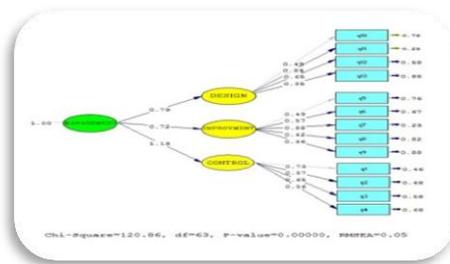


Fig. 2. Second Phase of Process Management Confirmatory Factor Analysis in Standard Estimate State

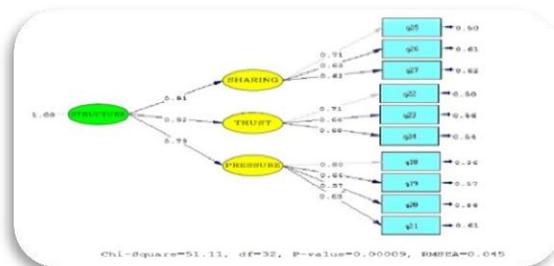


Fig. 3. Second Phase of Collaborative Structure Confirmatory Factor Analysis in Standard Estimate State

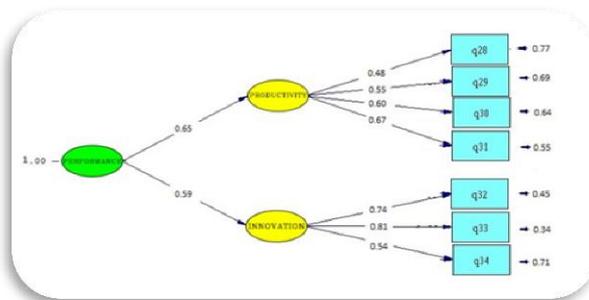


Fig. 4. Second Phase of Organizational Performance Confirmatory Factor Analysis in Standard Estimate State

The factor loading of each item in the questionnaire with latent variables as well as the relationship between the organization performance and its sub-variables in the standard estimation can be seen in Fig. 4. As can be observed, factor loading is optimal and higher than 0.3. Therefore, an effective relationship between the organization’s performance, innovation, and productivity is observed. Results obtained from the second phase of confirmatory factor analysis (main components) in the significance coefficients state.

The significant coefficient of each item in the questionnaire with latent variables as well as the relationship between process management and its sub-variables can be seen in Fig. 5.

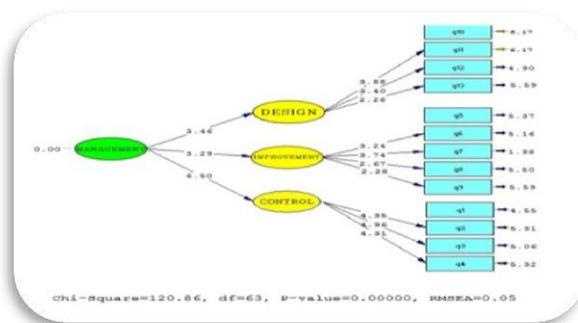


Fig. 5. Second Phase of Process Management Confirmatory Factor Analysis in Significance Coefficient State

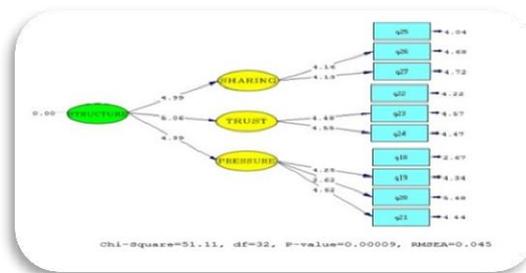


Fig. 6. Second Phase of Collaborative Structure Confirmatory Factor Analysis in Significance Coefficient State

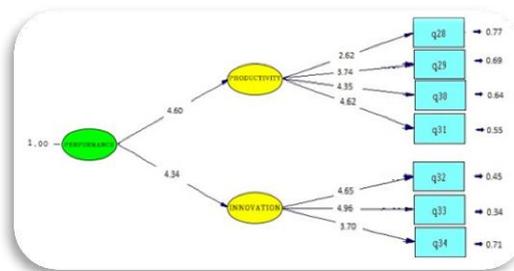


Fig. 7. Second Phase of Organizational Performance Confirmatory Factor Analysis in Significance Coefficient State

The significant coefficient of each item in the questionnaire with latent variables as well as the relationship between the common structure and its sub-variables can be seen in Fig. 6. As can be observed, the significant coefficient is higher than 1.96 or lower than -1.96. This is an indication of the meaningfulness of the relations. Therefore, the questions are appropriate for the measurement of the variables in question.

The significant coefficient of each item in the questionnaire with latent variables as well as the relationship between the organization performance and its sub-variables can be seen in Fig. 7. As can be observed, the significant coefficient is higher than 1.96 or lower than -1.96. This is an indicative of the meaningfulness of the relations. Therefore, the questions are appropriate for the measurement of the variables in question.

An Analysis of the Existing Status of the Research Main Variables

In this phase, results obtained from the analysis of the existing status of the research main variables are examined. To do so, the one-sample *t*-test was employed and the results are presented in Table 2.

Table 2. The Existing Status of Main Variables

Variable	Sample Mean	SD	Criterion Mean	df	t	Sig. Level
Process Management	3/12	0/67	3	66	4/74	0/15
Collaborative Structure	3/06	0/62	3	66	5/14	0/40
Competitive Intensity	3/03	0/60	3	66	5/28	0/65
Organizational Performance	2/99	0/73	3	66	6/02	0/92
IJMS						Table 2 Main variables

As depicted in Table 2, the mean of the research main variables almost equals criterion mean and also considering *t* value obtained in *df*=66, the difference between the mean of the variables and that of the criterion (3) is not significant. Accordingly, it can be said that the mean of the variables is about medium.

Testing the Research Hypotheses using Structural Equation Modeling

In studies concerning behavioral sciences, multivariate analysis is one of the strongest analysis methods since the nature of such researches is multivariate and they can't be examined using bivariate correlation, in which an independent variable and a dependent one is taken into account. Accordingly, the present study adopted structural equation modeling to investigate the hypotheses.

The factor loading of each variable in the questionnaire in standard estimation in the structural equation model can be observed in Fig. 8. As can be observed, factor loading is optimal and higher than 0.3.

The significant coefficient in the main research variables in the structural equation model can be seen in Fig. 9. As can be observed, the significant coefficient is higher than 1.96 or lower than -1.96. This is an indicative of the meaningfulness of the relationship between the main research variables.

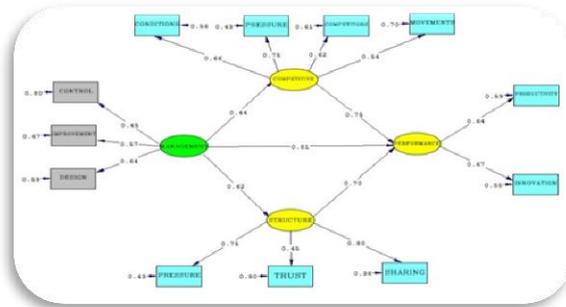


Fig. 8. Structural Equation Modeling in Standard Estimate State

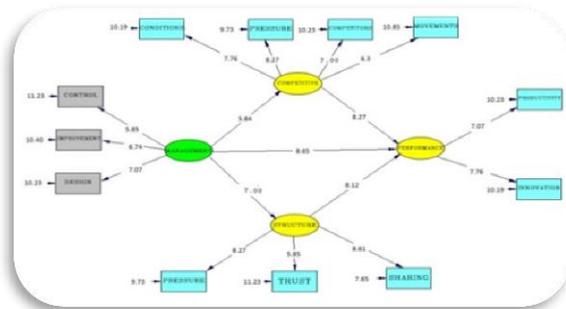


Fig. 9. Structural Equation Modeling in Significance Level

Table 3. Summary of the Relationship between Research Variables

Relationship of Variables		Impact Factor	Sig. Level	Result
Process Management	Competitive Intensity	0/44	5/84	+
Process Management	Collaborative Structure	0/62	7	+
Process Management	Organizational Performance	0/81	8/65	+
Competitive Intensity	Organizational Performance	0/75	8/27	+
Collaborative Structure	Organizational Performance	0/70	8/12	+

IJMS

Table 3
Relationship
Between
Variables

Table 3 presents the summary of the relationship between the research main variables using structural equation modeling. Goodness of Fit Indexes of the model is presented in Table 4, which illustrates that the indexes are relatively appropriate and the model's fit is nearly high. Having estimated the model parameters, the researcher is able to calculate the statistics of the model fit.

Table 4. Fit Indexes of Structural Equation Modeling

Indexes	Shorthand	General rules for acceptable fit if data are continuous	Categorical Data
Comparative fit			
Normed fit index	NFI	≥0.95 for acceptance	
Incremental fit index	IFI	≥0.95 for acceptance	0.95
Comparative fit index	CFI	≥0.95 for acceptance	
Absolute/predictive fit			
χ^2	χ^2	Ratio of χ^2 to df ≤2 or 3, useful for nested models/model trimming	2.29
Others			
Goodness-of-fit index	GFI	≥0.95 Not generally recommended	0.93
Adjusted GFI	AGFI	≥0.95 Performance poor in simulation studies	0.91
Root mean square error of Approximation	RMSEA	<0.06 to 0.08 with confidence interval	0.06
IJMS Source: Singla et al. (2018)			Table 4 Criteria for cutoff for Several fit indexes

Table 5. Summary of the Research Result

No.	Proposition	Hypothesis	Results	
			Confirmed	Rejected
1	Process management positively influences competitive intensity		*	
2	Competitive intensity positively influences organizational performance		*	
3	Process management positively influences collaborative structure		*	
4	Collaborative structure positively influences organizational performance		*	IJMS
5	Process management positively influences organizational performance		*	
6	Process management positively influences organizational performance due to the mediating role of competitive intensity		*	
7	Process management positively influences organizational performance due to the mediating role of collaborative structure		*	
8	Process management positively influences organizational performance due to the mediating role of competitive intensity and collaborative structure		*	Table 5 Summary of results

According to Table 4, it can be concluded that due to the acceptable range, the observed values of fitness indicators are in suitable values; thus, the presented model has suitable fitness. Table 5 provides a summary of the findings obtained from the research hypotheses.

Discussion and Implications

The findings are supportive of all hypotheses. The results are to some extent consistent with previous papers; however, minor differences and new knowledge were found. The findings on the relationship between process management and organization performance will be discussed in this section. Examining the influence of competitive intensity and collaborative structure along with the relationship between the organization and process management was the ultimate goal of the current paper. Process management's impact on the performance in the efficiency and innovation aspect is dependent on the competitive intensity and collaborative structure.

The results yielded concerning the research hypothesis 1 indicate that process management positively impacts on competitive intensity and that there is a high correlation between the two variables. The results are in line with those of Sanders Jones and Linderman (2014) and Hill (2000). Moreover, the results, obtained regarding the research hypothesis 2, show that competitive intensity positively influences organizational performance, a finding which coincides with that of related studies. Likewise, the results reported by Sanders Jones and Linderman (2014) confirm the major role played by various levels of competitive intensity in organizational performance.

Furthermore, the findings with regard to the research hypothesis 3 indicate that process management positively affects collaborative structure and that there is a high correlation between the two variables, a result in line with that of related studies such as Chong and Zhou (2014). The most considerable variable in collaborative structure was trust. Accordingly, the research hypothesis 4 is confirmed as well. The positive effect of collaborative structure on organizational performance shows that given competitive pressures, organizations, which successfully employ trust and information sharing, have better organizational performance. In the present study, two innovation and

productivity aspects have the greatest effect on organizational performance. The results obtained from this study are in line with those of Chong and Zhou (2014).

In the case of the research hypothesis 5, the results indicated that process management positively influences organizational performance and that there is a high correlation between the two variables. The findings coincide with those of Kim et al. (2012), Prajogo (2008), Sanders Jones and Linderman (2014), and Crocket and McGregor (2006). Sanders Jones and Linderman (2014) as well as Chong and Zhou (2014) emphasized that under the mediating role of competitive intensity and collaborative structure, some aspects of process management positively influence organizational performance. They contend that competitive intensity and collaborative structure are among the factors supporting the relationship between process management and organizational performance. It should be noted that the results approve the research hypotheses 6 and 7.

Finally, as all the research main hypotheses are confirmed, the research main one is approved as well. To remain competitive, organizations working in developing countries are required to step towards excellence using modern theories and tools. Since the effect of the mediating role of collaborative structure and competitive intensity in the relationship between process management and organizational performance in other Iranian organizations has not been investigated, it is about the most significant aspects of innovation in this study.

Implications

Our results inform managers that the incorporation of collaborative structure and competitive intensity, a probability variable, clearly demonstrates the influences of process control and process improvement on the organization's performance. In practical connotations, if the different degrees of process design, control, and improvement are customized to fit with the collaboration and competition power, process management can be an efficacious mechanism for productivity and innovation. However, the upshots reveal that the process management implementation, with the robust integration of the customer and the organization, and highlighting the

customers' needs, is the variable useful in improving the organization's innovation. Through realizing the internal benefits of collaborative structure and its elements, the outcomes highly recommend the managers move forward toward finding and making the advantages of these potential benefits. This study highlights that managers need to appreciate the crucial role of innovation in order to improve the performance in their organizations. The findings are of utmost importance for managers, especially for the managers in service organizations and SCM. No matter what the services or productions are, the service or products' quality is notably critical and decisive.

Conclusion

Efficient management in business processes is regarded as a key component for organizations active in competitive business environments. This article is one of the numerable researches to examine the organization's performance by two core elements and process management in three categories. The chief difference between the current studies and those in the literature is focusing on the collaborative structure by three core elements: trust, information sharing, and competitive pressure. This study investigates the effect of competitive intensity and collaborative structure of the organization's performance.

In case some of the favorable measures are accessible, all companies will benefit in the supply chain. Most of the studies in the realm of university have focused their attention on the overall performance of supply chain, such as cost and quality, services, delivery, reliability as well as responding to the constant changes in the market. Most of the studies designed and carried out on the relationship of performance and process management, as well as the competitive intensity and collaborative structure were focused on the industry level competition. As the results show a limited number of studies focused on analyzing the influences of competition at the firm-level. Utilizing the current approach, the researcher was able to indicate and highlight the importance of process design, enhancement, and control in the organizational level's performance. The inclusion of competitive intensity and collaborative structure as a contingency variable helps to explain the contextual situation when the elements of process

management can significantly impact process management. In addition, this study empirically supports the idea of the usefulness of process management in flexible situations with which organizations face.

Limitations and Further Suggestions

This research uses only perceptual measures of organizational performance and process management. Ketokiivi and Schroeder (2004) showed that conceptual methods were reliable. A line open for further studies is adopting an objective criterion in measuring the productivity, innovation, trust, information sharing, usefulness as well as performance. Adopting longitudinal studies, future researchers will be able to investigate the process of control and process design in productivity and innovation. The data for the current research were obtained from an organization in Iran, raising the possibility that the results may not be directly applicable to certain Western countries. The most significant suggested topics with regard to the results of the present study include: Given the significance of process management as indicated by the research results, it is suggested that managers pay special attention to codified planning when supervising the status quo to ensure organization's stability and compatible performance with its environment. Moreover, considering process control, it is required that organizations decrease reworking, instead concentrate on the influences of process and efficiency. An investigation of other aspects of organizational performance and process management is necessary in future researches. It is also recommended that the effect of various competitive intensity levels (high, medium and low levels) on collaborative structure and cooperation in organizations be taken into consideration.

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References

- Adomako, S., Opoku, R. A., & Frimpong, K. (2017). The moderating influence of competitive intensity on the relationship between CEOs' regulatory foci and SME internationalization. *Journal of International Management*, 23(3), 268-278.
- Ang, S. H. (2008). Competitive intensity and collaboration: Impact on firm growth across technological environments. *Strategic Management Journal*, 29(10), 1057-1075.
- Antony, J. P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs-Part 1: A conceptual framework. *Measuring Business Excellence*, 14(2), 3-11.
- Azzemou, R., & Nouredine, M. (2018). Continuous improvement for the firm's competitiveness: Implementation of a new management model. *Management Science Letters*, 8(1), 19-32.
- Bae, H., Lee, S., & Moon, I. (2014). Planning of business process execution in Business Process Management environments. *Information Sciences*, 268, 357-369.
- Bakar, L. J. A., & Ahmad, H. (2010). Assessing the relationship between firm resources and product innovation performance: A resource-based view. *Business Process Management Journal*, 16(3), 420-435.
- Barnett, W. P. (1997). The dynamics of competitive intensity. *Administrative Science Quarterly*, 128-160.
- Benner, M. J., & Tushman, M. (2002). Process management and technological innovation: A longitudinal study of the photography and paint industries. *Administrative science quarterly*, 47(4), 676-707.
- Chavez, R., Gimenez, C., Fynes, B., Wiengarten, F., & Yu, W. (2013). Internal lean practices and operational performance: The contingency perspective of industry clockspeed. *International Journal of Operations & Production Management*, 33(5), 562-588.
- Chen, Y., Wang, Y., Nevo, S., Benitez-Amado, J., & Kou, G. (2015). IT capabilities and product innovation performance: The roles of corporate entrepreneurship and competitive intensity. *Information & Management*, 52(6), 643-657 .

- Chong, A. Y. L., & Zhou, L. (2014). Demand chain management: Relationships between external antecedents, web-based integration and service innovation performance. *International Journal of Production Economics*, 154, 48-58.
- Crockett, R. O., & McGregor, J. (2006). Six sigma still pays off at Motorola. *Business Week*, December, 4, 4.
- Deng, L., Yang, M., & Marcoulides, K. M. (2018). Structural equation modeling with many variables: A systematic review of issues and developments. *Frontiers in psychology*, 9.
- Dobbels, L., Cardon, G., & Willem, A. (2014). The influence of a collaborative structure on the sport promotional effect of a youth sport camp: A multilevel-analysis. In 22nd Annual conference of the EASM 2014: *Social and Commercial Impact of Sport*. European Association for Sport Management (EASM).
- Donaldson, L. (2001). *The contingency theory of organizations*. Sage.
- Donaldson, L. (2006). The contingency theory of organizational design: Challenges and opportunities. In *Organization Design* (pp. 19-40). Springer, Boston, MA.
- Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. *Administrative science quarterly*, 514-539.
- Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2013). *Fundamentals of business process management*. Berlin: Springer.
- Gavrea, C., Ilies, L., & Stegorean, R. (2011). Determinants of organizational performance: The case of Romania. *Management & Marketing*, 6(2), 285.
- Ghoreyshi, M., & Safarzadeh, H. (2011). The role of using business process management system in the improvement of organizational performance. *Quarterly Journal of Roshd -e-Fanavari*, 7th year. 26(1). 47-53. (in Persian)
- Hammer, M. (2010). What is business process management? *Handbook on Business Process Management*. J. v. Brocke and M. Rosemann. Berlin, published in Springer.
- Haynes, C., Miles, S., & Luck, M. (2014). Monitoring the impact of norms upon organisational performance: A simulation approach. In *Coordination, Organizations, Institutions, and Norms in Agent Systems* (pp. 103-119). Springer International Publishing

- and empirical study. *Total Quality Management & Business Excellence*, 17(1), 21-40.
- Haynes, C., Miles, S., & Luck, M. (2014). Monitoring the impact of norms upon organisational performance: A simulation approach. In *Coordination, Organizations, Institutions, and Norms in Agent Systems* (pp. 103-119). Springer International Publishing In Control and Decision Conference (CCDC), 2015 27th Chinese (pp. 3925-3928).
- Hill, T., & Hill, A. (2009). *Manufacturing strategy: Text and cases*. Palgrave Macmillan.
- Johannessen, J. A., & Skaalsvik, H. (2015). The development of innovations in organizations: The role of creative energy fields. *Kybernetes*, 44(1), 89-106.
- Juran, J., & Godfrey, A. B. (1999). Quality handbook. *Republished McGraw-Hill*, 173-178.
- Katz, D., & Kahn, R. L. (1978). *The Social Psychology of Organizations* (Vol. 2, p. 528). New York: Wiley.
- Ketokivi, M. A., & Schroeder, R. G. (2004). Perceptual measures of performance: Fact or fiction?. *Journal of Operations Management*, 22(3), 247-264.
- Kim, D. Y., Kumar, V., & Kumar, U. (2012). Relationship between quality management practices and innovation. *Journal of operations management*, 30(4), 295-315.
- Klassen, R. D., & Menor, L. J. (2007). The process management triangle: An empirical investigation of process trade-offs. *Journal of Operations Management*, 25(5), 1015-1034.
- L. Sanders Jones, J., & Linderman, K. (2014). Process management, innovation and efficiency performance: The moderating effect of competitive intensity. *Business Process Management Journal*, 20(2), 335-358.
- Mendling, J., Weber, I., Aalst, W. V. D., Brocke, J. V., Cabanillas, C., Daniel, F., ... & Gal, A. (2018). Blockchains for business process management-challenges and opportunities. *ACM Transactions on Management Information Systems (TMIS)*, 9(1), 4.
- Moyano-Fuentes, J., Maqueira-Marín, J. M., & Bruque-Cámara, S. (2018). Process innovation and environmental sustainability

- engagement: An application on technological firms. *Journal of Cleaner Production*, 171, 844-856.
- Nair, A. (2006). Meta-analysis of the relationship between quality management practices and firm performance—implications for quality management theory development. *Journal of Operations Management*, 24(6), 948-975.
- Nikolova-Alexieva, V. (2012). Exploring the state of business processes management in the Bulgarian enterprises. *Procedia-Social and Behavioral Sciences*, 62(1), 1350-1354.
- Ota, M., Hazama, Y., & Samson, D. (2013). Japanese innovation processes. *International Journal of Operations & Production Management*, 33(3), 275-295.
- Pradabwong, J., Braziotis, C., Tannock, J. D., & Pawar, K. S. (2017). Business process management and supply chain collaboration: Effects on performance and competitiveness. *Supply Chain Management: An International Journal*, 22(2), 107-121.
- Prajogo, D., Toy, J., Bhattacharya, A., Oke, A., & Cheng, T. C. E. (2018). The relationships between information management, process management and operational performance: Internal and external contexts. *International Journal of Production Economics*, 199, 95-103.
- Randhawa, J. S., & Sethi, A. S. (2017). An empirical study to examine the role of smart manufacturing in improving productivity and accelerating innovation. *International Journal of Engineering and Management Research (IJEMR)*, 7(3), 607-615.
- Rezaie, K., Tadayon, S., Ostadi B., & Aqdasi, M. (2009). Key success factors in the implementation of process management and introduction of a framework for the evaluation of organizational readiness. *Journal of Industrial Management*, 1 (3), p 37-52 (in Persian).
- Rummler, G. A., & Brache, A. P. (2012). *Improving Performance: How to Manage the White Space on the Organization Chart*. John Wiley & Sons.
- Savalei, V. (2018). On the computation of the RMSEA and CFI from the mean-and-variance corrected test statistic with nonnormal data in SEM. *Multivariate Behavioral Research*, 53(3), 419-429.

- Shafie, M ., & Tarmast, P. (2014). The effect of supply chain process management on competitive advantage and organizational performance. *Journal of Quantitative Research in Management*, 5th year, No. (2) 105-124. (in Persian)
- Smart, P. A., Maddern, H., & Maull, R. S. (2009). Understanding business process management: Implications for theory and practice. *British Journal of Management*, 20(4), 491-507.
- Tsai, K. H., & Hsu, T. T. (2014). Cross-functional collaboration, competitive intensity, knowledge integration mechanisms, and new product performance: A mediated moderation model. *Industrial Marketing Management*, 43(2), 293-303.
- Von Rosing, M., Von Scheel, H., & Scheer, A. W. (2014). *The Complete Business Process Handbook: Body of Knowledge from Process Modeling to BPM* (Vol. 1). Morgan Kaufmann.
- Ward, P. T., & Duray, R. (2000). Manufacturing strategy in context: Environment, competitive strategy and manufacturing strategy. *Journal of Operations Management*, 18(2), 123-138.
- Wu, L., & Chuang, C. H. (2010). Examining the diffusion of electronic supply chain management with external antecedents and firm performance: A multi-stage analysis. *Decision Support Systems*, 50(1), 103-115
- Yarmohammadian, M. H., Ebrahimipour H., & Dousti, F. (2012). Familiarity with business process management approach in medical organizations. *Health Information Management*,. (9) 1123-1131. (in Persian)
- Zhao, R. M. (2015). Human resource management practices as a mediating variable between supply chain quality management and organizational performance. In *Control and Decision Conference (CCDC), 2015 27th Chinese* (pp. 3925-3928).