

**THE EFFECT OF COMMUNICATION TECHNOLOGY ON THE
RELATIONSHIP BETWEEN ORGANIZATIONAL
ENVIRONMENT AND ORGANIZATIONAL STRUCTURE:
STUDY IN BANKING INDUSTRY***

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ABSTRACT

This study examines the moderating effect of communication technology on the relationship between organizational environment and organizational structure. Responses from 94 managers (59% response rate) were collected through questionnaire that had been distributed to 32 banks in Pekanbaru, Riau Province, Indonesia. Using a multiple regression analysis, the results show that the interaction of environmental dynamism and communication technology has a negative effect on organizational structure (formalization, complexity and integration). This study also found that the relationship between environmental complexity and centralization of organizational structure was moderated by communication technology. Meanwhile, communication technology has a positif effect on the relationship between environmental complexity and organizational structure (complexity and integration). This study provides further evidence on the importance of communication technology to organizational structure.

Keywords: Communication technology, organizational environment, environmental dynamism, environmental complexity, organizational structure

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INTRODUCTION

Organizations represent dominant institute form in society that has totally diffused into all life aspect. Robbins (1994) defines organization as social entity that consciously coordinates which relative continuously to an objective or objectives. Schein in Cahayati (2003) emphasize organizations as an open system that has constant interaction with environment and also consists of many sub groups, occupation units, hierarchy formation that spread geographically. Because representing an open system hence organizations experience to change, repair, or renewal. The purpose of organizational change is to improve organizational effectiveness, job satisfaction and adjustment with environmental situation.

As an input output transformation system that base on environment to the continuity, hence there are three special trihedral in organization which able to change. These trihedral include technological change, structural change, and human being change (Cahayati, 2003). Reasons for those changing are environment, value and objective, technology, structure, behavioral factor and consultant.

Technology refer to information, equipments, technique, and process requires to change input become output in an organization. There is an agreement expressing that technological concept although have mechanic or manufacture connotation still applicable to all kind of organization even a manufacturing business, Hospital, Social Institute, newspaper both Bank (Robbins, 1994). Technology Information has role as management supporter to entire organizational activity with high level of efficiency effectiveness and productivity. Even information represents one of the very strategic organizational resources.

Huber (1990) express that technology information can be distribute into two different groups that are computer technology and communications technology. Computer technology represent MIS combination, knowledge system and decision support system. While information technology related with technology that needed communication such as local area network (LAN), wide area network (WAN), electronic mail system, voice mail system, radio phone, video text, voice mail and electronic conferencing.

As an organization that base on environmental change, Bank, in the movement doesn't miss from effect that cause by the change. If we see condition in the year 1998, many Banks in Indonesia became bankruptcy/liquidation or being merger. Because of merger hence

automatically structure from a Bank will change from structure before merger process happened. Further competition level that happen to banking industry itself oblige Bank keep innovative and using kind of technology to becoming the first, where technology communications being part of input which is meaningful to banking industry itself.

The purpose of this research is to see how far communications technology as moderating variable will strengthening or weakening the relationship between organization structure and organization environment in banking industry. Researcher assume that manager specially manager in banking represent people who do not only recognize the important of technology information but also have to practice it by themselves things related to technology information, so that result that obtain will be more be usefully.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Environmental dynamism, formalization of organizational structure and communication technology

Formalization of organizational structure can be defined as an organization which role and activity clearly documented and reported and has written procedure and regulation (Almilia, 2003). According to Robbins (1994) the relationship between environment and formalization of organizational structure depend on the stability of the environment itself. In the more stable environment, organization become more formalize because stable environment create minimum requirement to give quickly response and enable organization to thrifty by standardize their activity. But the assumption that dynamic environment will produce low formalization to organization cannot be disregard. It is because management usually isolate their activity from environmental uncertainty. In other hand technology positively relate with formalization. In research conducted by Tjakrawala (2003) in manufacturing company in Indonesia conclude that in a more dynamic environment, the organization needs to restructure its organization to become less formalization. This condition cause management to provide more information by applying by application technology of communication.

Based on the explanation above, we propose the following hypothesis:

H1: Dynamic environment will have an effect on formalization of organizational structure if moderated by communication technology.

Environmental dynamism, complexity of organizational structure and communication technology

Complexity of organizational structure can be defined as organization with difference function and sub unit which differentiate target, task orientation, time and autonomous level or differentiate market strategy, technology and product in organizational interaction. Environmental uncertainties directly connect with complexity (Robbins, 1994). It means high environmental uncertainty cause large complexity. So those, to face dynamic and complex environment hence organization have to become more differentiate. According to Robbins (1994) technology positively correlate with low organization complexity. According to Tjakrawala (2003), more dynamic an environment needs organization chart to become more complex and requires attitude from organization such as permeate more information that able to do by application of communication technology.

Based on the explanation above, we propose the following hypothesis:

H2: Dynamic environment will give an effect complexity of organizational structure if moderated by communication technology.

Environmental dynamism, integration of organizational structure and communication technology

Integration of organizational structure can be identified if some of organization activities can be coordinated in formal coordination. Classical theorists suggest that integration of organizational structure needs procedures and regulations in order to drive member's behavior (Gibson, 1993). Thomson in Gibson (1993) expresses that procedure and regulation use to measure integration of organizational structure will lose its fascination if the organization environment is not dynamic. Tjakrawala (2002), also express that a more dynamic an environment needs more integrated organization chart and requires attitude from organization such as permeate more information that able to do by application of communication technology.

Based on the explanation above, we propose the following hypothesis:

H3: Dynamic environment will give an effect to integration of organizational structure if moderated by communications technology.

Environmental complexity, centralization of organizational structure and communication technology

The centralization of organizational structure can be defined as an structure where decision maker reside at top management where middle and lower management have no participation in decision making. The more complex the environment then more decentralizes the structure. Technology also has relation with structure decentralize. Tjakrawala (2002) found that the more complex the environment then organization structure become more centralize and requires attitude from organization such as permeate more information that able to do by application of communication technology.

Based on the explanation above, we propose the following hypothesis:

H4: Environmental complexity will have an effect to centralization of organizational structure if moderated by communication technology.

Environmental complexity, complexity of organizational structure and communication technology

Environmental complexity can be described as an environment that surrounded by strength external influences. In this environment, the organization has to interact with that external strength. According to Robbins (1994) less complex (or not complex) environment have direct relationship with complexity of organization structure. Its means that high not complex environment cause high complexity of organizational structure. Its also oblige organization with not complex environment fortify itself with some department and larger specialization means as more complex organization structure. More complex an environment cause more complex organization structure and requires attitude from organization such as permeate more information that able to do by application of communication technology.

Based on the explanation above, we propose the following hypothesis:

H5: Environmental Complexity will have an effect to company structure complexity if moderate by communications technology.

Environmental complexity, integration of organizational structure and communication technology

Integration is process to align organizational goal and activities in sub-system in execute organizational tasks (Gibson, 1993). An integrated structure will correlate directly with environmental complexity of the organization. Its mean that more complex environmental cause organization structure to become more integrated and requires attitude from organization such as permeate more information that able to do by application of communication technology.

Based on the explanation above, we propose the following hypothesis:

H6: Environmental complexity will have an effect integration of organizational structure if moderated by communications technology.

RESEARCH METHODOLOGY

Sample and Procedure

This research is conducted in Pekanbaru, Riau Province, Indonesia. Respondents of this research are managers and head division or executive from 32 bank, both private and government bank, that exist in Pekanbaru. Managers, head division and executives are selected as respondents of this research, because managers not only understand the important of communication technology in a company but also practice this communication technology by themselves.

Researchers used personally administrate questionnaires method to collect the data. From 160 questioners that distribute to 32 banks (100%), 23 banks (72%) returned the questioners. Total questioners that return are 94 questioners (59% response rate) and total of 90 questionnaires then use in the final analysis.

Measure

The major measures for the study were perception of environmental dynamism, environmental complexity, formalization of organizational structure, complexity of organizational structure, integration of organizational structure, centralization of organizational

structure, and communication technology. Respondents also completed the questionnaire by giving some information on background or personal characteristics of respondents.

Formalization of organizational structure

Formalization of organizational structure is measured using a three items instrument. The questions were adapted from Miller and Friesen (1982), Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the role of regulation and procedure in their organization. Sample items include “Regulation and procedure are documented in this organization”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of formalization of organizational structure. Higher scores indicate greater levels of formalization of organizational structure.

Complexity of organizational structure

Complexity of organizational structure is measured using a three items instrument. The questions were adapted from Miller and Friesen (1982), Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the the complexity of their business related to the variety of the product and marketing strategy. Sample items include “This organization has different marketing strategy for different product”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of formalization of organizational structure. Higher scores indicate greater levels of complexity of organizational structure.

Integration of organizational structure

Integration of organizational structure is measured using a four items instrument. The questions were adapted from Miller and Friesen (1982), Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the the integration of the element in the organization. Sample items include “The collaboration among divisions in this organization support to the project ”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of formalization of organizational structure.

Centralization of organizational structure

Integration of organizational structure is measured using a six items instrument. The questions were adapted from Miller and Friesen (1982), Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the decision making in their organization. Sample items include “The decision to introduce the new product/service is made by top management”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of formalization of organizational structure

Environmental dynamism

Environmental dynamism is measured using a five items instrument. The questions were adapted from Miller and Friesen (1982) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the delegation of decision making in their organization. Sample items include “The decision to introduce the new product/service is made by top management”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of environmental dynamism.

Environmental complexity

Environmental dynamism is measured using a six items instrument. The questions were adapted from Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the business complexity in their organization. Sample items include “This organization has many competitors”. Respondents indicated their answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of environmental complexity.

Communication technology

Communication technology is measured using a 13 items instrument. The questions were adapted from Ramamurthy (1990) and Almilia (2003). Respondents are required to rate their perception on the extent to which he/she views the usage of computer and communication technology in their organization. Sample items include “To what extent that your organization use computer and communication technology in payroll system”. Respondents indicated their

answers on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) for each item of communication technology. Higher scores indicate greater levels of the usage of computers and communication technology in the organization.

RESULT ANALYSIS

Descriptive Analysis

The sample consisted of 27 females (30%) and 63 males (70%). Respondents averaged 34 years of age and reported an average of roughly 8 years of full-time work experience. Level of education reflected the following; doctorate (n=1), master's degree (n=7), undergraduate's degree (n=58), and 3 years diploma (n=24).

Before analyzing the data, the validity and quality of the data and instrument have been check. The instrument was validated using The Cronbach Alpha and the result show that all instrument have $\alpha > 0.05$ except variable of formalization of organization structure. Such that this variable has been remove from the analysis and cause the researchers unable to test the first hypothesis. Researcher also test data normality and classic assumption tests such as autocorrelation, multikolinearitas, and also heterodasitas and the data shows satisfying result.

Result and Discussion

This research use multiple regression analysis with SPSS (Statistical Product and Service Solution) version 12.0 to test the all proposed hypotheses. Table 1 describes the the result of the regression analysis.

Table 1

Result of Regression Analysis

Hypothesis	R ²	F	Sig	t	β	
Hypothesis 2	0.273	10.766	0.000	-2.440	-0.287	Interaction between environmental dynamism and communication technology
Hypothesis 3	0.328	14.019	0.000	-2.726	-0.191	Interaction between environment dynamism and communication technology
Hypothesis 4	0.096	3.036	0.033	-2.071	-0.430	Interaction between environmental complexity and communication technology
Hypothesis 5	0.221	8.111	0.000	0.341	0.046	Interaction between environmental complexity and communication technology
Hypothesis 6	0.311	12.960	0.000	0.779	0.061	Interaction between environment complexity and communication technology

From Table 1 above we can see that result of regression analysis for second hypothesis indicates that coefficient β is significant. Coefficient β equal to - 0.287 with p equal to 0.000 ($p < 0.05$) indicating that the interaction between environmental dynamism and communications technology have negative relationship with the complexity of organizational structure. It can be inferred from the result that if an organization is in a dynamic environment and then use communications technology, the organizational structure becomes less complex. In this condition, communication technology act as moderating variable. Thereby second hypothesis is accepted.

With the accepted of second hypothesis hence we can concluded that a dynamic environment will cause the organization structure to become less complex. The phenomenon requires attitude from organization such as permeate more information that able to do by application of communication technology.

Third hypothesis (H3) proposed that dynamic environment will give an effect to integration of organizational structure if moderated by communications technology. Result of regression analysis to third hypothesis indicate that coefficient β is significant. Coefficient β equal to - 0.191 with p equal to 0.000 ($p < 0.05$) indicate that dynamic environment moderate by communications technology have negative relationship with integration of company organizational structure. If organization is in a more dynamic environments if moderated by communications technology will result in less integrated organizational structure. Thereby third hypothesis is accepted. Conclusion which can be pulled from accepting of this third hypothesis is in a dynamic environment the organization structure will be less integrated. This phenomenon requires attitude from organization such as permeate more information that able to do by application of communication technology.

Fourth hypothesis (H4) predicted that the environmental complexity will have an effect to centralization of organizational structure if moderated by communications technology. Result of regression analysis to fourth hypothesis indicating that coefficient β is significant. Coefficient β equal to - 0.430 with p equal to 0.000 ($p < 0.05$) indicate communication technology moderate the relationship between environmental complexity and centralization of organixational structure. If an organization in a more complex environment use communication technology it will reduce the centralization in the organization.

The fifth hypothesis (H5) proposed that environmental complexity will have an effect to complexity of organizational structure if moderate by communications technology. Result of regression analysis to fifth hypothesis indicating that coefficient β is significant. Coefficient β equal to 0.046 with p equal to 0.000 ($p < 0.05$) indicate that environment complexity moderate by communications technology has positive relationship with company structure complexity. More complex company environments moderate by communications technology hence more complex company structure. Thereby fifth hypothesis is accepted. Conclusion which can be pulled from accepting of this fifth hypothesis is more complex organization environment will cause the organization structure more complex. This phenomenon requires attitude from organization such as permeate more information that able to do by application of communication technology.

Sixth hypothesis (H6) express environmental complexity will have an effect to company structure integration if moderate by communications technology. Result of regression analysis to

sixth hypothesis indicating that coefficient β is significant. Coefficient β equal to 0.061 with p equal to 0.000 ($p < 0.05$) indicate that environment complexity moderate by communications technology has positive relationship with company structure integration. More complex organization environments moderate by communications technology hence more integrated the company structure. Thereby sixth hypothesis is accepted..

With the accepted of sixth hypothesis hence we can concluded that more complex organization environment will cause the organization structure more integrated. This phenomenon requires attitude from organization such as permeate more information that able to do by application of communication technology.

CONCLUSION

The purpose of this study is to examine the perception of managers about the entry of technology communication in an organization. Communication technology play as a moderator variable between environment and the organization structure. This research reach some conclusion. First, the more dynamic organizational environments if moderate by communications technology the less complex (not complex) the organizational structure. Second, more dynamic company environments and then moderated by using communications technology hence less integrated the organization structure. Third, more complex organization environments moderated by communications technology hence less centralize the company structure. Fourth, more complex company environments moderated by communications technology hence more complex company structure. And fifth, more complex company environments moderated by communications technology hence more integrated the company structure

Thereby result of this research support all hypothesis that raise, and from entire examination we can conclude the role of communications technology as moderator variable is very significant. This study has some limitation such as relatively small sample size, only in one industry that might limit the generalization of the study and survey research design that might make the respondents to answers the question based on what they think is a good response rather than what they actually feel. Future research can extent this study in different industry, add more sample size, use the more advance statistical method to test the moderating (such as Structural Equation Modelling) and add some variable to predict the relationship between organization environment and organizational structure.

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