Effect of The Project Control Management Through Networking Communication Perspective

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Abstract: - Our study considers the dual characteristics of the networking platform for interaction and the networking content for formality as the construction of organizational management activities that involve network technologies. Of particular concern is the project control mechanism, implementing which is one of the five most important major management activities described by [15]. The empirical study concerns a consulting company that operates a community. Moreover, our study explores how network technologies are used in organizational management activities, especially with respect to project control issues. Many propositions are made in the conclusions which provide contributions including the networking interaction & formality are positively correlated with communication, especially on the project control mechanisms in a firm; however, the degree of interaction has less effect on the formality than formality on interaction while communicating around network environment.

Keywords: - Control, platform, interaction, content, formality, project.

1. Introduction

Standard criteria are applied to analyze management in organizations. Advance in network technology have greatly changed management activities in organizations [1]. Many modern organizations use information technology (IT) for everyday tasks to an extent that makes IT the most important factor that governs organizational management issues. The authors have found rarely academic study on the relevant to problems of project controlling activities in organization. Our study will introduce both the infrastructure of networking platform and information of networking content in relation to organizational project control topics. Then, the content analysis method will be applied to investigate the problems of project control to better understand mechanisms of organizational project control problems. Finally, propositions are made, and direction of future research proposed. The reset of this paper is organized as follows. Section 2 describes the organizational control literature. Section 3 then introduces the research design. Next, section 4 shows that data analysis. Results and discuss are finally made in Section 5.

2. Control Management

2.1 Literature Review

[30] asserted that the essence of control management is the set of activities and processes by which a manager can influence others in an organization composite meaning of domination, management and inspection [16]. Organizational appraisals members and goal setting through job control method, so [24] combined with Transaction Theory to explicate three control mechanisms – the market, bureaucracy and the clan. Which can be used by an organization to better perform controlling functions? The market mechanism uses price to guide the controlling directly. The bureaucratic ([23]; [26]) mechanism uses fixed policies, rules and procedures to set the boundaries of controlling individual behavior in the organization. The clan mechanism depends wholly on socialization processes that apply informal principles and disciplines to realize social axioms. Operational control focuses on such matters as quality, quantity, cost and time [2]. Human resources constitute the most important factor that determines the performance of an organization [13]. Encouraging members to fulfill theirs potential and controlling their behaviors are equally important. Management uses human factors to exercise controlling issues. A human performance control system is required to enable the enterprise to meet its goals. A cost and profit control system must be designed to enable the organization to reach its financial goals. Of course, processes of production also can be targets of project control. Controlling objects are many because organizational structures,

technology and products are diverse. Job Control Theory and Agent Theory are always discussed together [4] because both of them can be used to solve problems of risk associated with agents in organizations, so such that a project control system must be designed well. Hill & Jones studied the procedure and function or strategic control and considered relationships among various control systems and bureaucratic costs according to the perspective of the Agency Theory. They identified four organizational control methods – market control, production control, bureaucracy control and culture control [29]. The type of management control described in Hill & Jones's study has four organizational factors. They are organizational environment factors for marketing, organizational member factor for production, organizational structure factor for bureaucracy and organizational social factor for culture. Clearly, regardless of the controlling objectives identified by management scholars, the four factors all proposed by Hill & Jones's perspective.

2.2 Controlling Variables

In our study, project control includes coordination, method or skills implemented in the firm's internal environment to achieve organizational targets [22]. The primary concepts concern the use of network technology including networking platform and networking content to rethink the project control mechanisms that operate the current organization. In another words, an organization must adjust its controlling mechanisms to response to the new ways of network technology. A review of the literature ([24]; [4], [30]; [28]; [20]; [9]; [29]; [12]; [7]; [19]; [8]; [11]; [31]) in organizational control management yields the following research variables. The first is the organizational environment factor for marketing, and this variable measures *standard*. A standard operational procedure can transfer, monitor and record steps within the organization or conduct the behavior of organizational members. The second variable is the organizational member factor for production, and this variable measures *performance*. A performance evaluation can help a manager to develop its business because the company's success comes from all of the members' collective efforts. The third variable is organizational structure for bureaucracy, and the variable concerns measures *authority*. Whether the decision making is centralized within the organizational kernel members, authority is concentrated. The fourth is the organizational social factor for culture, and the variable measures *consensus*. The organization must think singularly so that its members can share the

same ideas and a single vision. Member will then make compromises to success in complete the mission when conflict arises in the organization.

3. Research Design

3.1 Research Framework

Controlling problems in the information age are initially understood through observing and analyzing of real business examples. Daily tasks in the organization are performed more effectively and rapidly if information technology is used. Regardless of the hardware or software involved, all of which constitute data communication technology, [27] said that both the networking platform and the networking content important issues subjects. A review of the literature allows a property designed research framework to be proposed, to elucidate the structure of the networking platform and networking content as independent variables. Of course, organizational project control is the dependent variable. The measurement of interaction owing to networking platform is the variables: the amount of networking connectivity, the quantity of exchanging information and the ability of platform maintenance - in all, three research variables. The measurement of formality owing to networking content is the variables: the portion by which of firm do decision making, the range by which of firm do business activities and the method by which of firm do information announcement – in all, another three research variables. The research variables of project control are (1) standard, (2) performance, (3) authority and (4) consensus, as listed above. Fig. 1 depicts halt of the research framework, and shows that organizational project control depends on the networking platform for interaction and networking content for formality. The definition of project control herein this work concerns the organizational internal project control requirements to achieve the firm's goals. Clearly, the meaning of networking platform of interest herein concerns interactions within the networking infrastructure and the meaning of networking content concerns the formality of the information on the network.
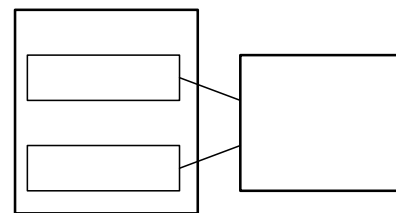

Fig. 1 : Research framework development (1/2)

3.2 Measurement of Networking Platform and Network Content

The networking platform is discussed with reference to networking infrastructure, which refers to interactive capability; networking content is discussed with reference to networking information, which refers to formal capability. The former quantifies the members' contact with each other since every member in the organization performs valuable activities to help to reach the same goals to the organization. Hence, the circumstances of contact depend on the infrastructure built by the networking platform. The latter measure is the level of the recognition of information comes from networking content since the goal of each member in the organization must share the information together. Those will be discussed below.

3.2.1 *Interaction*

An organization must take advantage of the connectivity of its computer network to support valuable activities involved in doing business. Networking interactions can be measured by the amount of networking connectivity, the quantity of exchanging information and the ability of platform maintenance.

3.2.1.1 *Amount of networking connectivity*

Types of networking connection include the traditional telecommunication network and the current global Internet [21]. A network represents constitutes an information interchange field by connecting different types of computer network [6]. The measurement of interaction increases with the extent amount of networking connection.

3.2.1.2 *Quantity of exchanging information*

Data are produced after something happens. Information is the basis for decision making because data are re-ordered. An organization usually needs to keeping business going so decision-relevant information changes continuously, and messages may be published on a bulletin board ([17]; [14]). The interactive measurement increases with the extent quantity of exchanging information.

3.2.1.3 *Ability of platform maintenance*

An organization must maintain the operating functions of communication platform to keep the business running smoothly, using a variety of computer networking connections and by supporting the exchange of information. In another words, this variable measures the ability of a computer channel to delivering a message. The interactive measurement increases with a better ability to maintain a stable networking platform.

3.2.2 *Formality*

An organization should use information on a network to perform valuable tasks daily. The networking information formality can be measured as the mean of the portion by which of firm do decision making, the range by which of firm do business activities and the method by which of firm do information announcement.

3.2.2.1 *Portion of decision making*

Accurate information can help businesses to make correct decisions in a timely manner during business operations [10]. Information must be highly accurate timely and confidential. Generally, the provision of decision-relevant information differs with the degree of usage of networking information across businesses. In other words, if the portion of organizational decision making increases then the formality of the networking content increases.

3.2.2.2 *Range of business activities*

When a business activity strongly depends on the information content of the network, members must pay attention to the information provided by the network channel. If the range of the business activities widens, the formality of the networking content will increase.

3.2.2.3 *Method of information announcement*

The information announcement focuses on a firm's internal activities, which are routinely broadcast over a channel. They include example, a new member's reporting for duty, training activities. Such information is commonly disseminated via a network channel [25]. As firm publishes more information over a network, the formality of the networking content will increase.

3.3 Two Dimensions of Network Technology

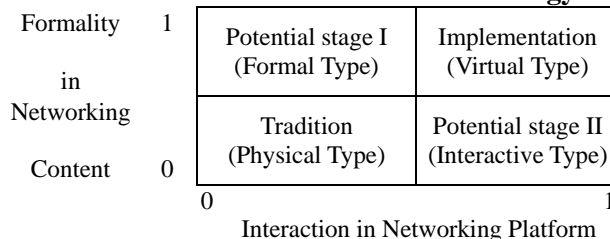| Formality	1	Potential stage I (Formal Type)	Implementation (Virtual Type)
in Networking			
Content	0	Tradition (Physical Type)	Potential stage II (Interactive Type)
		0	1

Interaction in Networking Platform

Fig. 2 : Two dimensions of network technology

In summary, Fig. 2 shows two dimensions of network technology. The measurement of the variables will be evaluated by conducting interviews with the researchers who will work together to rank each variable. The variables of interaction and formality are summed, and then plotted on scales in two dimensions to estimate the capability of the network technology. If both are low, then the using of network technology is considered to be of the tradition named physical type. If both are high, then the using of network technology is considered to be of the Implementation named virtual type. If the interaction is low level but the formality is high, then the using of network technology is considered to be

of the naming of formal type but in potential stage I. Otherwise, if the interaction is high level but the formality is low, then the using of network technology is considered to be of the naming of interactive type but in potential stage II.

| Amount of network connectivity |
| Quantity of exchanging information |
| Ability of platform maintenance |

Networking Platform

| Standard |
| Performance |
| Authorization |
| Consensus |

Project Control

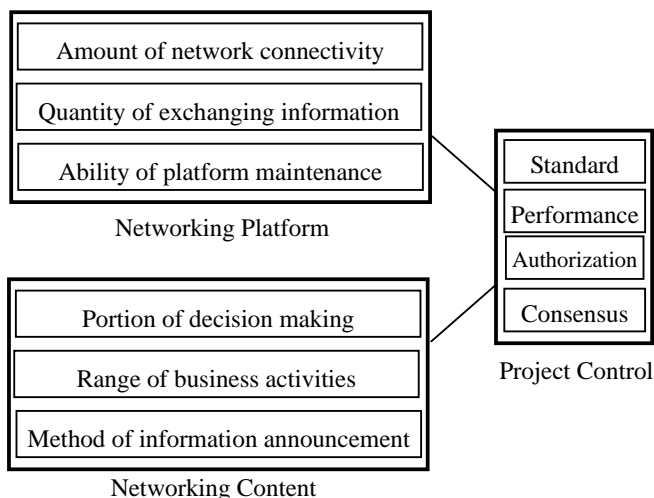| Portion of decision making |
| Range of business activities |
| Method of information announcement |

Networking Content

Fig. 3 : Research framework development (2/2)

The detailed research framework in Fig. 3 can be finally derived by extend the interactive variables owing to networking platform, formal variable owing to networking content, and project control. Firstly, the research samples will be focused on the measurement of the interaction within networking platform and the measurement of formality within networking content, and two dimensions are used to plot the results of the analysis of the network technology. Raw data are collected and evaluated by the method of content analysis. Three analysts will be invited to measure the level of interaction and formality. The evaluation of analysts must eventually be consistent because reliability must be ensured.

Our study thinks that the questionnaire would not be an effective means of collecting data because it cannot easily obtain a large number of suitable samples, and the return rate would impact the results as well. Therefore, an invited consulting company

case that operating a community are conducted to obtain raw data and analyze the results. This is why a good community was chosen for our study of organizational project control. The major member was interviewed and observations of community were made. Delivered information was posted on its own web and was developed wholly by community members. The information that is provided on the network includes announcements, plans, events bulletins and performance evaluation. The community was a good choice because its members often exchange information via the network.

4. Data Analysis

4.1 Introduction to the Research Sample

The community for our study simulates a general firm. The term "community" refers to a group of members, who reside in a limited area, like a village or town, and live together in a single management unit. An Internet community is formed because the Internet offers value-added services in several areas of life and entertainment. This community provides the residents with a satisfactory quality of life and services. They have already established and operations, including guard services, security, VIP activity center management, maintenance of public areas and festivals, are proceeding. Academic agencies were also invited to establish management information system to provide the contents on the web sites. The members of the community all use ADLS or CABLE Modem to link into Internet. Although some members, such as the elderly, are still unfamiliar with computers, and some families that do not have computers, the committee of community is striving to implement projects to transmit information and offer the advantages of the Internet to each member and family.

4.2 Measurement of Networking Interaction

The content analysis method yields the results in Tab. 1, as stated by three analysts who reviewed raw data presented in an interview.

Tab. 1 : Mutual agreement of networking interaction

Mutual Agreement	A & B	A & C	B & C	ABC's Average	Reliability
Amount of networking connectivity	0.7	0.75	0.8	0.75	0.90
Quantity of exchanging information	0.8	0.7	0.9	0.8	0.92
Ability of platform maintenance	0.6	0.7	0.8	0.7	0.86

The amount of networking connectivity, the quantity of exchanging information and the ability of platform maintenance, regardless of whether the grading is by an individual analyst of a group of analysts, the degree of mutual agreement among, and reliability of the assessments, the three analysts must both exceed 0.7, which is the minimum required [5].

The analysis clearly shows that the three variables positively obtain mutual agreement and meet the reliability as required. Therefore, the measurement of analysis indicates that the degree of networking interaction is as shown in Tab. 2. Our study finds that in this community, three variables positively influence the interaction, implying that the members

of the organizations in this case interact extensively   using the network.

Tab. 2： Measurement of networking interaction

Networking Interaction	A	B	C	Average	All Average
Amount of networking connectivity	0.8	0.9	0.7	0.80	
Quantity of exchanging information	0.7	0.6	0.9	0.73	0.71
Ability of platform maintenance	0.5	0.8	0.5	0.60	

4.3 Measurement of Networking Formality

The content analysis yields the results in Tab. 3, as obtained from three analysts who reviewed raw data presented in an interview.

Tab. 3： Mutual agreement of networking formality

Mutual Agreement	A & B	A & C	B & C	ABC's Average	Reliability
Portion of decision making	0.7	0.9	0.8	0.8	0.92
Range of business activities	0.8	0.6	0.7	0.7	0.86
Method of information announcement	0.8	0.7	0.9	0.8	0.92

The portion by which of firm do decision making, the range by which of firm do business activities and the method by which of firm do information announcement, regardless of whether the grading is by an individual analyst of a group of analysts, the degree of mutual agreement among, and reliability of the assessments of the three analysts must both exceed 0.7, which is the minimum required [5]. The analysis clearly reveals that the three variables positively obtain mutual agreement and meet the reliability as required. Consequently, the measurement of analysis yields the degree of the networking formality in Tab. 4, and in this community, the effects of the three variables are not all equivalent. The unique characteristics, including the non-profit nature of this community, as well as the weak demand for the formality of networking information are such that the variables do not reflect a strong tendency. The portion by which of firm do decision making, which depends on the organizational policy-making, falls in the low grade; the range by which of firm do business activities is intermediate grade since the community has been less active recently than it has been in the past, while the method by which of firm do information announcement falls in the high grade.

Tab. 4: Measurement of networking formality

Networking Interaction	A	B	C	Average	All Average
Portion of decision making	0.2	0.1	0.3	0.2	
Range of business activities	0.5	0.5	0.5	0.5	0.5
Method of information announcement	0.8	0.7	0.9	0.8	

4.4 The Measurement of Two Dimensions of Network Technology

In the community case, the three variables addressed with reference to the degree of networking interaction all fall in the high grade, and the overall average is 0.71, which those considered with reference to the degree of networking formality fall in the intermediate grade, and the overall average is 0.5, as shown in Fig. 4. The community case belongs to the potential stage II of interactive type.
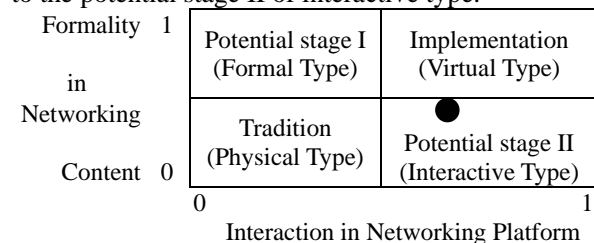

Fig. 4： Two dimensions of interaction and formality

4.5 Discussion of Controlling Variables

4.5.1 *Standard*

Project control mechanism that involves standard in an organization is such that a firm's tasks can be accomplished according to the procedures established by the manager. Staffs should obey manager's instructions to complete the organizational tasks. This project control mechanism concerns the extent of the use of standard in the operation of an organization, including is involved in strategic planning, the response system and setting goals in firm. However, researchers have so far observed that the utilization of the standard mechanism tends to be diverse, such as in gaining the a consensus among the entire community, providing a management fees balance report, presenting the results of budget execution, procedures for cleaning, and selecting and appointing both staffs and guards. The community regularly holds coordination meetings to enable the chief secretary to communicate with residents, and to monitor the implementation of works in daily work.

4.5.2 *Performance*

Performance as a project control mechanism usually implies directing conduct or production by

supervision, documentation and grading. The management committee is the highest administrative agency in the community case, and is responsible for managing the community. The committee will review the budget balance monthly, and adjust goals from time to time. The chief secretary will regularly or irregularly distribute the records using many kinds of channels or systems, and the residents will be asked to cooperate. This process is called conduct project control. Additionally, staffs work full time with full payment, ensuring that the community can be planned and managed well, to maintain the high living level of all its members. Depending on individual performance, bonuses are paid when important holidays or a festival comes. The bonus does not come from the monthly maintenance fees but from residents' additional contributions.

4.5.3 *Authorization*

The term authorization used herein refers to policy-making in the organization. The kernel of community is the management committee, and the members of the organization are all of the residents. Since the number of community members is large, and residents have various customs, habits and working hours, integrating all opinions is quite difficult. Normally, the chief secretary in charge of the committee will unify residents' opinions. Although the chief secretary is in charge of the community's affairs, he does not have a right to make decisions. The management committee, which consists of all community members, is the policy-making kernel that project controls the overall community.

4.5.4 *Consensus*

Consensus is strongly associated with socialization. The management committee holds many activities to promote a sense of community to maintain a consensus and keep members together; to reduce the possibility of conflicts' arising among the goals of the community, to maintain good intra-community and inter-resident relationships, and meet targets established by the committee. After conducting interviews and making observations, researchers have found that several activities in the community use informal project control methods to promote consensus. They include interactions among residents on the same floor, the cleaning of public areas by volunteers, regular activities during festivals, and parenting education. Since community members have various backgrounds and participate in activities spontaneously, a consensus can be reached, and community activities can be smoothly conducted.

4.6 Cross Analysis

4.6.1 *Interaction with Project control*

Network can be used to connect the management committee with the community's members and increase the frequency of their interaction. A high rate of interaction can later be used to achieve the community's goal of project controlling in organization. The amount of networking connectivity among the community's member falls in the high range, as does the quantity of exchanging information. Although the ability of platform maintenance is not as high as expected, it still falls in the intermediate range. However, using the network to increase the frequency of the interaction between the committee and the residents is generally feasible. In another words, the community must adjust the standard, performance, authorization and consensus according to the interactive attributes of the network. The networking interaction facilitates the documentation of procedures, even when location separation. With reference to performance and consensus, they can be easily applied in cyber space by sending messages back and forth on the networking platform among members of the community who are not face-to-face. Authorizing the power of management through the networking platform is not feasible because the duties following authorization cannot be performed in cyber space. If the degree of networking interaction is generally increasing, then the project control mechanism of the organization will be adjusted accordingly.

4.6.2 *Formality with Project control*

The organization must possess sufficient correct information to project control the steps of jobs successfully, and a network that is fast and convenient can allow a large amount of information to be accessed. However, in an environment flooded with information, whether correct information can be provided during the project control process, using all kinds of tools and techniques are an important index of project control mechanism. Concerning the three research variables studied for this community indicates that the formality of networking content varies as the everyday work of the organization is performed. Firstly, the portion by which of firm do decision making depends strongly on the organizational policy, which is in the low range; the range by which of firm do business activities is intermediate, while the method by which of firm do information announcement is in the high range. However, the use of the networking content as the formal information in the project control process must be promoted. In particular, in this community case, the recognition of the reasonableness of the networking content in this stage does not meet a particular levels therefore it has only limited effect

on the project control variables, especially when standard, performance and authorization can not be easily through the network, but an informal consensus project control mechanism can be implemented to a certain extent over the network. For organization overall, if the formality can be increased enhanced to a more effective level, then the managing project control can be altered; otherwise,

strongly depends on the traditional methods.

5. Results and Discussion

Discussions based on the data analysis toward the networking platform, networking content, and project control mechanisms, the diagram shown in Fig. 5 will be the basis to develop the propositions.
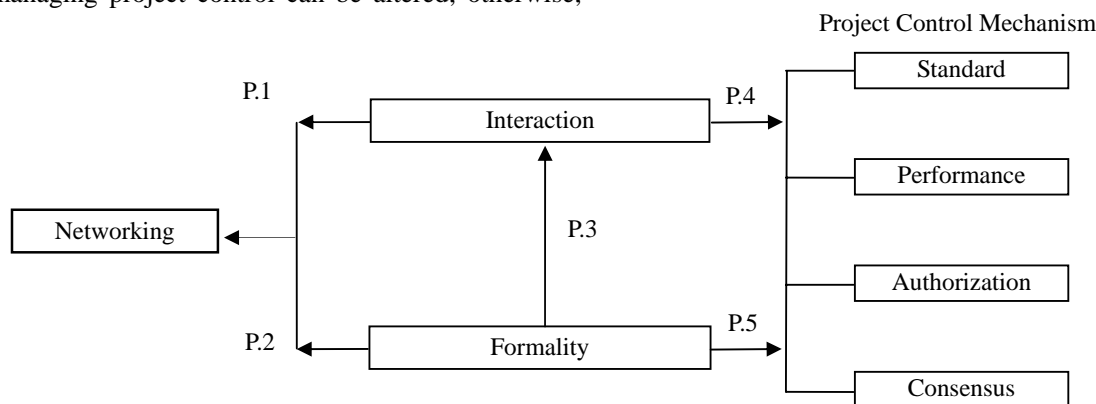
Fig. 5: Proposition development structure

5.1 Networking Property Mechanisms

The variables that determine the degree of the networking interaction are the amount of networking connectivity, the quantity of exchanging information and the ability of platform maintenance. For an organization, the most important factor is the connectivity of the network. Only through the networking connectivity can a new type of organizational operation be accomplished within the limitation of space and time. In another words, as the organization practices more network communication, the interactions among the organizational members will depend more strongly on the network. As the reasons we discuss above we can conclude that

P.1: The degree of networking interaction in the current organization is positively correlated with the using of networking communication.

The variables that determine the degree of networking formality are the portion by which of firm do decision making, the range by which of firm do business activities and the method by which of firm do information announcement. After an organization is connected to the Internet, the formality of networking content will become very important than before. Since information is importantly involved in business activities, it is also the basis of value-added within a virtual value chain. Therefore, if the organizational operation allows the networking content to be considered formality by organizational members, then more of such information will be used. As the reasons we discuss above we can conclude that

P.2: The degree of networking formality in the

current organization is positively correlated with the using of networking communication.

The intensity of an organizational communication is positive related to the networking interaction. However, the networking interaction is not related in any precise way to the networking formality. A higher degree of interaction corresponds to more divers means of connection, more frequent sending of electronic messages, and smoother communication. However, the contents of the interaction do not necessarily become formal or official documents in the organizational policy-making. Daily communication does not inevitably that should be the basis of all business activities. However, if the degree of the formality is high, it will positively influence the networking interaction since electronic messages must be transmitted using the networking platform. As the reasons we discuss above we can conclude that

P.3: The degree of networking interaction has less effect on the networking formality than the networking formality has on the networking interaction.

5.2 Project Control Mechanisms

The degree of the networking interaction is related to the delivery of business information within organizations. If an organization lacks the ability to use its network, then it will certainly use conventional methods to conduct information-based interaction. Operations, internal communication, and message distribution in an organization are not replaced or reinforced by a network, so an organizational internal project controls tend to

depend on more standardized mechanisms, including sales reports, sign-in and punch cards for attendance, schedule reports and reviews. Additionally, with reference to performance review and approval, for the same reasons of the low degree of networking interaction, an organization tends to use conventional means such as salary, reward and bonus to feed back the performance of an individual to meet the management targets. Whether members can reach a consensus depends on their holding a common view on a particular issue. However, gathering opinions depends on continual communication, of which in-person conversations, telephone conversations and written messages are feasible method. Organizations hope to form consensus around public opinions, goals and views at company wide. Messages are going back and forth in cyber space over the network in the organization. Whether to an individual or a group, the management can consider building more consensus using organizational project control mechanisms on a networking platform with a higher degree of interaction. With reference to authorization, when information is not transmitted through cyber space, the centralization of the organization will be not avoidably. Although policy-making authorization cannot necessarily change by using the network, organization should specify responsibilities and authority, then a clear, smooth, upward and downward channel for conveying policy-making messages must be established. As the reasons we discuss above we can conclude that

p.4：The networking interaction will influence the project control mechanisms in an organization.

p.4-1：As the degree of networking interaction declines, the traditional standard, performance, authorization and consensus project control mechanism tends to increase.

The formality of networking content refers to the fact that an organization uses the network to deliver policies, by distributing the organizational messages, approved by the company. Therefore, documents need not be rewritten or resent to concerned agencies. Of course, most business activities involve the networking information to be the source of decision making. When the project control mechanism is to be applied, and the degree of formality is high, organizations can replace conventional means, such as the use of sign-in and punch cards for attendance, sales reports and schedule reports, with networking information. With reference to performance reviews and approval, a high degree of formality allows many tasks to be accomplished in cyber space. If organizations cannot adopt conventional management methods, which are

face-to-face, visual and behavior-output-based, then the performance of the project control mechanism of the organization tends to be lower than otherwise. If the networking content is unreasonable when organizational members are communicating, then the authorization of the project control mechanism of the organizations tends to be lower. In another words, organizations still depend on common methods of authorization to convey the goals of the company. The members must reach consensus in common, interactive ways. When the degree of formality is lower, organizations still tend to centralize policy-making at a higher management level, and give less authority to organization members. The lower degree of formality makes the consensus of organizational members more difficult to reach. As the reasons we discuss above we can conclude that

p.5：The networking formality will influence the project control mechanisms in an organization.

p.5-1：When the degree of networking formality declines, then the traditional standard applies and the performance project control mechanisms tend to increase.

p.5-2：When the degree of networking formality increases, then traditional authorization applies and the consensus project control mechanism tends to increase.

6. Conclusion

Our study identifies the networking platform and networking content as the two dimensions for determining the foundation of organizational management activities that involve network technology issues. It is obviously, an organization seeks to become more virtualization ([3]; [18]); the networking interaction and networking formality must firstly be reinforced. Traditionally, organizational business activities can be connected through a network, overcoming geographic boundaries. Once an environment has been built to connect internal departments with external companies, organizations can vertically integrate cooperation, communication, information flow, merchandise flow and cash flow. In another words, using network technology to connect upstream and downstream vendors globally, allows a new value-added chain to be formed reality.

Information is transmitted through networks. The effects of such networks on organizational management can be discussed from many perspectives. In academia, no study has been undertaken in this subject. This work seeks to analyze influence on networking interaction and networking content. Organizations in the network

technology age will be released from localization and fixedness. The quality and quantity of information have changed due to the network technology, allowing organizations to begin the transition to virtualization. Project control is also a practical issue. Project control is the essential factor that influences organizational performance, and flexibility and plasticity of instructions are very important. This work proposed many descriptions of project control in an organization. They provide manager of ordinary organizations with references, when achieving the goals of organizations in the using to network technology.

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