

Organization model for information system project: a literature review & blended learning case

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Abstract. Along with the development of information technology today, the development of information systems is also increasing. Organizations and personal competitions to make an information system. A reliable information system is produced by a team that has the ability to design, design and validate. With the increasing number of students at XYZ College and limited existing building facilities then one of the solutions that will be applied is the development of e-learning system to support teaching and learning activities. One important element in project management is determining the organizational model to be used. The purpose of this study is to determine whether the organization model is effective to manage the e-learning system project in the PT. The research method used is literature study and interviews with key stakeholders, especially leaders of universities. The results show that the effective organizational model for the blended learning information system project is to use functional organizational structure, since functional organization is more appropriate for small to medium scale projects, focusing on the division of tasks based on the function of each part, the difficulty level is low and the limitation of resources.

1. Introduction

Along with the rapid development of information technology today, the use of information systems is also increasing. Organizations and personal competitions to make an information system. Information systems developed vary, there are only limited to present the profile of a company, individual or a sophisticated system in the form of e-commerce, or operational a company. A reliable information system is produced by a team that has the ability to design, design and validate.

The process of managing a project must be through a mature plan such as what organizational model to use, how long it will take, the scope of work to be performed and how much it will cost to run a project. So the objectives of the project can be achieved well and run efficiently and effectively. Project management today is very important [1].

One important element in project management is determining the organizational model to be used. There are various organizational models that are currently in use, one of its models is



a functional model. This functional model determines each type of work into the part of the organization according to its function. Let's just pass the coding work to the part / team of the developer and assign the task / design work to the system analyst. All done on the basis of functionality [2].

With the increasing number of students, especially the class of employees held on Saturday week has been banned by the government or considered illegal. The impact is no recognition of the diploma for the model of Saturday or Sunday class classes. Therefore one of the alternative solutions undertaken by Higher Education is to build e-learning solutions based on blended learning. In other words, blended learning information system can help the learning process so that lectures can be held online at a predetermined time [3, 4, 5]. Furthermore, the organizational model of a blended learning information system development project needs to be determined based on its organizational structure.

This study aims to determine the organizational model, especially the most effective and efficient organizational structure to manage the blended learning information system development project in XYZ Higher Education. However, previously done literature review to know the model of organizational structure in the context of information system development projects.

2. Methodology

Frame the research method used is qualitative method which includes literature study, observation and interview. The literature study that writers do is collecting data that is directed to search data and information through articles both in journals, seminars and books in particular related to the organization model in the management of information systems projects. This is the basis for determining the organization model suitable for blended learning system project. Observation is the second step in collecting data after the author conducted a literature study. Data collection is done by direct observation of the existing conditions in the field including the availability of human resources, existing facilities, financing to stakeholder commitment. By doing the observation, the author becomes more understanding of the object being studied. Besides it, in this interviews were conducted to stakeholders in this case the top management of XYZ university to know the information system project initiatives and organizational models that are more suitable to be applied. This research includes descriptive qualitative research type which want to know picture about organization model which used to manage information system project. Descriptive research can be interpreted as a study related to human status, an object, a set of conditions, a system of thought or an event in the present. The purpose of descriptive research is to create a description, description or painting systematically, factually, accurately about the facts, properties and relationships between cases investigated [6]. Data to be collected and analyzed are qualitative data from the literature review of various related libraries as well as case studies conducted at XYZ University especially for blended learning information system development project. The qualitative data is a vast and well-defined source of description and contains deep explanation of the processes occurring within the specific and local scope [7].

3. Result and Discussion

This section discusses the results of the review literature on effective organizational models in information systems projects [8, 9, 10, 11, 12]. A project is usually part of a larger organization and within a company, for the organizational structure is very influential on the

sustainability of a project. Currently there are several types of organizational structures that can be applied, including:

3.1 Functional organizational structure

Within this structure, each section is led by a functional manager who will oversee several staff. Where a project normally headed by a functional manager can take its members from other functional staff managers that can be illustrated by Figure 1 as follows:

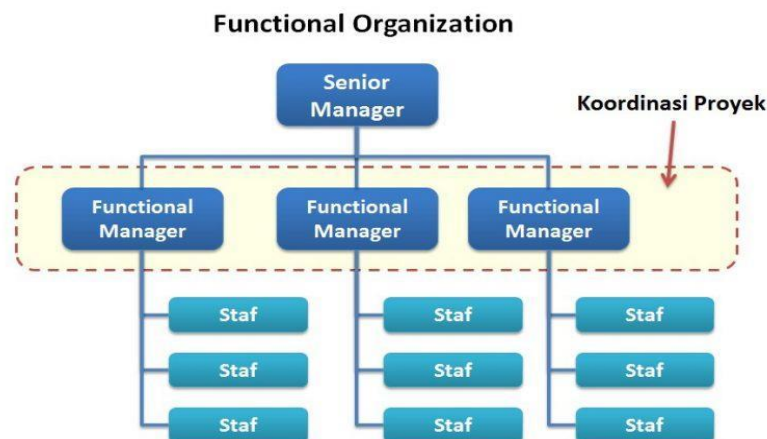


Figure 1. Functional Organizational Structure [11]

Here are some explanations of this structure:

- Focus on the division of tasks based on the function of each part
- Communications use up-front communication so that superior control over subordinates easier, simpler, and not repeatedly
- Each section tends to focus solely on their respective fields of work and communication between parts tends to be less open
- Movements and communication of each section are still blocked
- Small and medium scale organizations
- In it there are working groups of expert staff
- Specializing in the execution of tasks
- Low difficulty level
- Supervision is done strictly
- Does not guarantee unity of orders
- Save time for doing the same job

3.2 Matrix organizational structure

In the matrix organizational structure, each section will be led by a functional manager in charge of some staff, where a project usually consists of staff from several different functional managers and is led by one of the staff. Here are some explanations of this structure:

- There is a division based on the project / activity being carried out
- Use the HR of each division that together handles all projects together
- The utilization of human resources is efficient because the members have a regular job even though the project has been completed
- Communication and sharing between divisions is better than the functional type

- There is strong stakeholder involvement
- The division of human resources must be clear for each project, so there is no "seizure of human resources"
- Each member participates in every existing project, so their communication to each of their superiors that is more than one can be confusing.

In the matrix organizational structure there are 3 (three) sub types:

a. Weak matrix

In the weak matrix, the greatest authority exists in the project manager, the project manager also becomes the assistant of the project coordinator and the project coordinator serves to manage the schedule and progress, but has no authority in decision making that could be presented by figure 2 as follows:

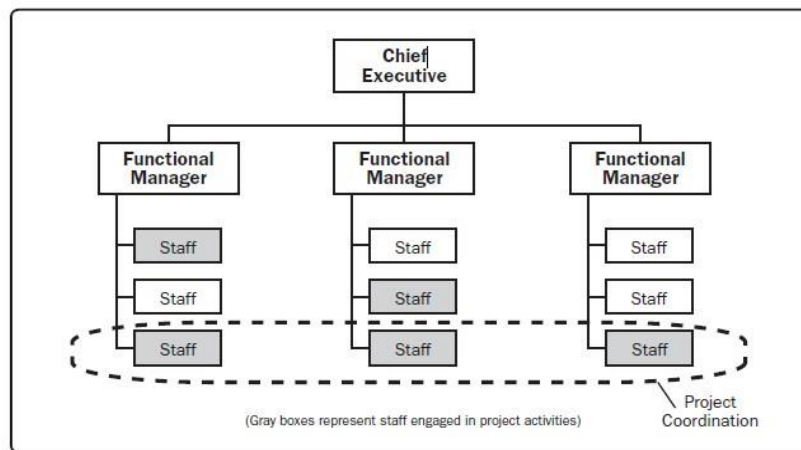


Figure 2. Weak Matrix Organizational Structure [11]

b. Balanced Matrix

In a balanced matrix model, there is a special position for a project coordinator or project manager who has authority in decision making. The project manager is in charge of managing the team to run within the scope, schedule and budget that could be seen at figure 3 below:

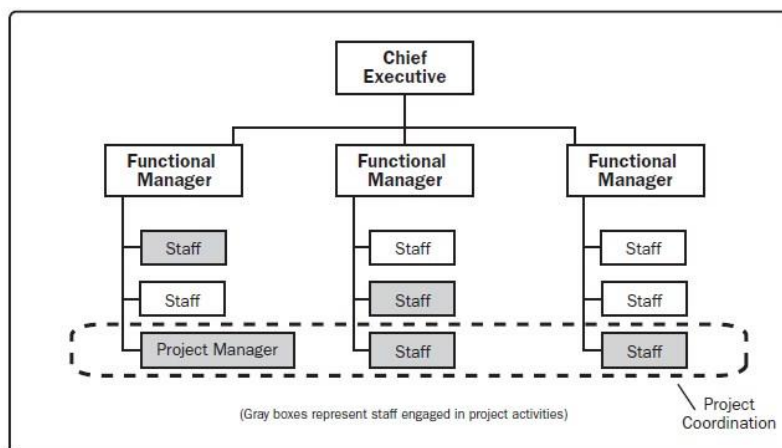


Figure 3. Balanced Matrix Organizational Structure [11]

c. Strong Matrix

In the strong matrix organizational structure, the project manager has greater authority and responsibility but is still limited and unable to take all decisions. In another sense the role of project manager is weak, but the role of functional Manager is strong. The project manager is only the project coordinator for organization, as illustrated at figure 4.

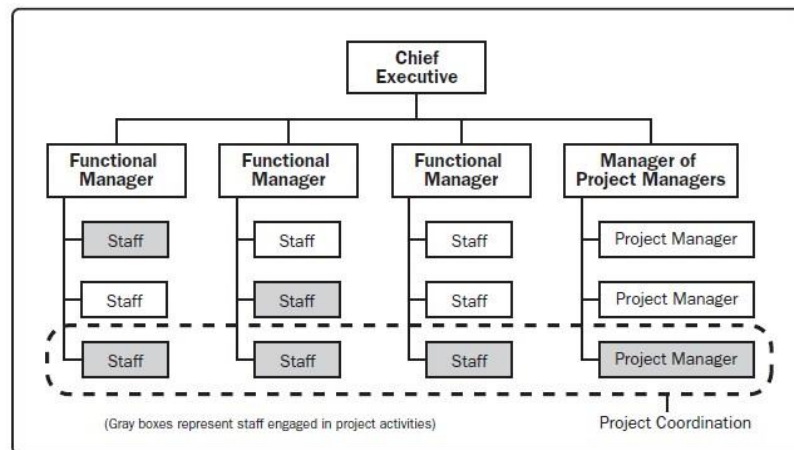


Figure 4. Strong Matrix Organizational Structure [11]

3.3 Project Organizational Structure

Within this structure each section is led by a Project Manager who directly oversees the staff who handle directly a project. In other words, a project coordinator has full authority and responsibility and the project coordinator has a special team. In this organizational system, a project coordinator acts as a team manager that could be presented at figure 5. Selecting a project organization form criteria/ considerations for choosing a project organization include:

- Frequency of new project
- The duration of the project's duration
- Project size
- The complexity of the relationship
- Uncertainty
- Uniqueness
- The importance of cost factors

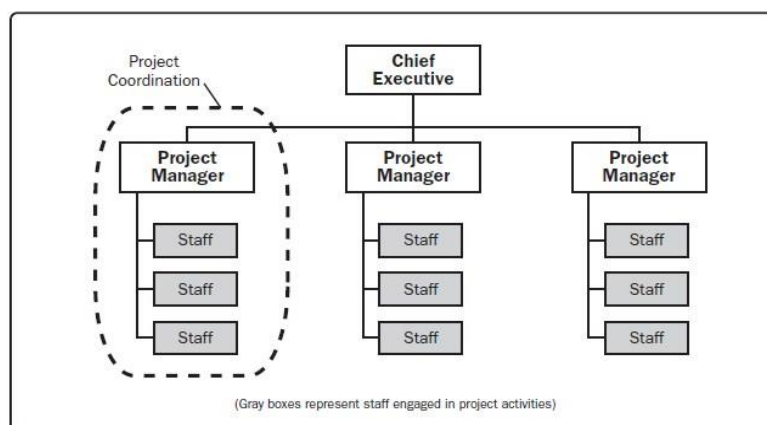


Figure 5. Project Organizational Structure [11]

Based on the results of the review literature obtained related to the organizational model for managing the information system project, the authors conducted an interview with stakeholders, namely 2 university leaders consisting of the rector and the vice-chancellor of academia as the team leader of the blended e-learning information system development project. From the interview result, it was found that the project initiative was encouraged by the prohibition of remote class model and the Saturday class by the government or considered illegal since the issuance of the Directorate of Directorate General of Higher Education Institution Number 595 / D5.1 / 2007. Saturday-Sunday lecture allegedly loaded with the simplification and compaction of the course so that the quality will not match expectations.

This has been regulated in the circular letter where the universities conducting regular lectures on Saturday-Sunday are violations and are not in accordance with learning rules. Other problems of Saturday-Sunday class are from lecturers and students. The physical condition of teachers who have been working throughout Saturday and Sunday is self-discretion as it is doubtful to provide maximum teaching. From the student side, the existence of material compaction in a short time creates difficulty understanding in catching the course. As a result, the government does not recognize the diplomas issued from the distant class model and the Saturday-Sunday class. Unlike the distant and Saturday-Sunday classes, the government supports a program of education with e-learning or is called a distance class (not a remote class/parallel), which is a type of modern education. Therefore based on applicable regulations, XYZ University develops a blended based e-learning system to facilitate the employee class in the learning process. The next step, XYZ University established the organizational structure to manage the blended learning information system development project. Based on the results of the review literature related to the organizational structure model, confirmation to the key respondents is also done to determine the model of organizational structure to be selected among the functional organizational structure, matrix or project organization.

From the interview results, it can be seen that there are some main characteristics associated with the development project of blended learning information system is related to organizational scale, time, cost and existing resources. From a small organizational scale formed consisting of only 4 (four) people including a team leader and 3 members. The three persons are also the technical part of information system development, instructor and administration or finance. The team leader is the vice rector of the academic field while the team members are lecturer staff from different backgrounds of science. The staff of the lecturers involved are also adapted to their expertise or specialization.

For example, for application development involved 2 lecturers faculty of computer science. Then for related learning material design, involved a lecturer with educational background. Thus, everyone involved tends to focus solely on their respective fields of work. The difficulty level of development can be classified as low because the information system using e-learning software based on open source that is Moodle. Moodle software is open and can be customized features to the needs of the organization. It is also closely linked to the limited costs that the college allocates for system development. In other words, the organizational model used is a functional organization model, where the organizational structure follows the existing structure. The blended learning development project is headed by a functional manager who oversees its members from other functional staff managers in this case the dean of the faculty. Uniquely the functional manager of the project is the vice-chancellor who in fact oversees the dean of the faculty. This gives an advantage when assigning tasks to members is often regarded as a command. But the weakness of the functional organizational

structure especially in the communication aspect where movement and communication of each part is still insulated so that the communication process between the parts tend to be less open. However this can be overcome by regular coordination meetings.

4. Conclusion

A reliable information system is produced by a team that has the ability to design, design and validate. One important element in project management is determining the organizational model to be used. for an effective organization model for the blended learning information project is to use a functional organizational structure, since functional organizations are more appropriately used for small to medium scale organizations, focusing on the division of tasks based on their respective parts function, low difficulty level and resource constraints or cost.

5. References

- [1] Schwalbe K, 2006, Information Technology Project Management. 4th Edition. Boston Massachusetts: Course Technology.
- [2] SantosaB, 2009, Manajemen Proyek Konsep & Implementasi. Yogyakarta : Graha Ilmu.
- [3] Adiyarta K Napitupulu D Rahim R Abdullah D and Setiawan MI, 2018, Analysis of E-learning Implementation Readiness Based on Integrated ELR Model *J. Phys. Conf. Ser.***1007**, 1 p. 12041.
- [4] Sensuse D I and Napitupulu D, 2017, The Study of User Acceptance Toward e-Learning System in Higher Education International Journal of Electrical Engineering and Computer Science**7**, 2p. 466- 473.
- [5] Napitupulu D, 2016, Kesiapan Implementasi E-learning di Lingkungan Universitas XYZ in Seminar Nasional Tekno Altek, Pusat Penelitian Inovasi LIPI.
- [6] Rachman T and Napitupulu D, 2018, User Acceptance Analysis of Potato Expert System Based on TAM Approach International Journal on Advanced Science, Engineering and Information Technology **8**, 1 p. 185-191.
- [7] Sekaran U, 2006, Metode Penelitian Bisnis. Jakarta : Salemba Empat
- [8] Hyvari I, 2006, Project Management effectiveness in project-oriented business organizations International Journal of Project Management **24**, p. 216-225.
- [9] Weidong X and Gwanhoo L, 2005, Complexity of Information Systems Development Projects: Conceptualization and Measurement Development J. of Management Information System **22**, p. 45-84.
- [10] Soeharto I, 2001, Manajemen Proyek dari Konseptual Sampai Operasional. Jilid 2. Edisi ke-2. Jakarta: Erlangga.
- [11] PMBOK, 2004, A guide to the Project Management Body of Knowledge (PMBOK Guide), Third Edition, Project Management Institute.
- [12] Kellner A, 2016, The Impact on Organizational Structures of Model-Based Mechatronic System Design in International Conference on System-Integrated Intelligence, Procedia Technology **26**, p.333-340