Business Process Management (BPM) in Operational BINUS Online Learning

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Abstract - **One of the challenges in organizing the "Pendidikan Jarak Jauh" (PJJ) program is about how to manage the class operational in the online learning environment, in order to support the creation of conductive academic lectures. Therefore, improvement of business processes, technological reliability (technology), and readiness of human resources (people) is very important to be done continuously in order to provide a perfect educational service for all stakeholders concerned. Because of its online environment, every academic operational activities should be run smoothly so the institution could deliver a high-quality services to every stakeholders related. Some of the activity that needed to be improved in academic operational is the exam preparation and planning process. Since it's still manual, the process of it is still reluctant of human-error and very time-consuming.. This study aims to implement business process management (BPM) in the exam preparation process in Operational Section of BINUS Online Learning, BPM framework will be conducted and some of tools are used in the research, such as business process model and notation, process selection matrix, and activity-based costing. Based on findings, online exam application came out as a proposed solution. Cost and time saving estimation by 85.85% and 36.04% are the result if the proposed solution will be developed and implemented.**

Keywords – business process management, activity-based-costing, business process management framework, business process, online learning business process

I. INTRODUCTION

Today, online learning has come as one of the alternative learning models that are in demand by the community. The presence of online learning that presents a more flexible learning environment for time and space, is much in demand by people who usually do not have much time to get a higher level of education. Flexibility that offers that learning activities can be done whenever and wherever by learners, ideally can also be monitored and controlled by the lecturers and managers of online learning.

In Indonesia, the growth of online learning more and more after the government published PERMENDIKBUD No. 109 Year 2013 about "Penyelenggaraan Pendidikan Jarak Jauh (PJJ)". The actors of educational institutions seem to be competing to be the first and largest in the implementation of the PJJ program, which is involves the online learning environment in its implementation. Nevertheless, there are still many details related to the implementation of the program, which has not been established by the government, so that the implementing institutions of the PJJ program, as it is still "learning" to determine the academic and operational matters related to the learning model.

One of the challenges in organizing PJJ program is about how to manage operational lectures in the learning environment in the network, so as to support the creation of conductive academic lectures. The operational activities of the lecture itself consist of lecture preparation activities, lectures, and lecturing services. The smoothness of all processes related to the operation of the lecture should be a very important thing, given the many activities of the lecture operations that directly involve students in it. Therefore, improvement of business processes, technological reliability (technology), and readiness of human resources (people) is very important to be done continuously in order to improve quality service for all stakeholders concerned [1].

Higher education has common processes such as management, human resource management, teaching & learning process improvement, and measurement analysis & improvement process. Focus on this research is revamping the business processes of Operation BINUS Online Learning. The

problem raised in this research is "Business Process Management at Operational BINUS Online Learning". And the scope of this study is only to review the business process of some operational transactions that occurred in the Operational BINUS Online Learning section, focus on exam preparation and planning process. This scope is a part of teaching & learning improvement process by Drăgan [1]. This research aims to implement business process management (BPM) in the Operational Section at BINUS Online Learning by:

- Understand the current condition of exam preparation and planning process in Operational Section of BINUS Online Learning.
- Propose improvements in terms of people, process, and technology for exam preparation and planning process in Operational Section of BINUS Online Learning.

II. LITERATURE REVIEW

According to Jeston and Nelis [2], Business Process Management (BPM) is the achievement of the organization's goals through the improvement, management, and control of the business process. Paul Harmon, Business Process Trends, defines BPM as a management discipline focused on improving company performance by managing the company's business processes [3]. By managing the business process, some issues such time, cost, employee allocation that led to efficiency improvement could also be analyzed [4]. There are 10 phases BPM framework according to John Jeston and Johan Nelis (Figure 1) [5], but six (6) phases will only be conducted in this research, they are:

1. *Organization Strategy*
   This phase includes ensuring the strategic, vision, strategic objectives, business and executives of the driver clearly understood by meaningful team members in involving people in the project. Need to understand that strategy is not a plan, a strategy is a meaningful process in engaging insiders and outsiders to get a new path or path.

2. *Process Architecture*
   In this phase the process architecture is designed. Process architecture has a meaning whereby organizations build rules, principles, guidelines and models to implement BPM within the organization.

3. *Launch Pad*
   Process objectives and vision must align with organizational strategy and process architecture to ensure that they will add value to strategy. Once the business units and processes have been selected and objectives agreed, the project must be set to maximize the likelihood of success.

4. *Understand*
   This phase is about understanding business process environments to enable innovate processes to take place. It is important that the metrics of the underlying process are at least collected to enable the establishment of the initial process cost for future comparison purposes. There will be need to identify, and ideally apply quick wins along the way, because businesses will not (and do not) provide unlimited funds for process improvement projects.

5. *Innovate*
   The project phase is creative, and often the most interesting. It should not only involve project and business teams, but also supporters of relevant interests both internally and externally. Once new options have been identified, there may be other needs to run simulations, activity-based costing, behavioral capacity planning and feasibility of implementation to enable the best finalization of options.

6. *People*
   This phase is a crucial phase in any process. People phase will be conducted at the same time with Develop [3].

III. RESEARCH METHODOLOGY

In collecting the data, observation and interview are conducted. The observation was set to capture the activities related to exam preparation and planning process. Meanwhile, interview with Operational Manager of BINUS Online Learning was set to capture the problems, issues, requirements, and also to confirm the findings and proposed solutions.

In this research there are six (6) phases will be implemented to analyze and design of BPM for exam process in Operational BINUS Online Learning:

1. *Organization Strategy*, at this stage will be an analysis global current condition of BINUS Online Learning.
2. *Process Architecture*, at this stage will give a big picture of all of the processes in BINUS Online Learning. Organizational Process View will be put for accommodating the need.
3. *Launch Pad*, this stage will be focused on the exam process of Operational BINUS Online Learning and analyze the current condition of people-process-technology related to the process. Process Selection Matrix will be put for accommodating the need.
4. *Understand*, this stage will analyze the selected process in-depth. Business Process Model & Notation and Activity-Based Costing will be put for accommodating the need.
5. *Innovate*, this stage will design a propose process related as a solution based on findings on the previous phases. Process Selection Matrix, Business Process Model & Notation, and Activity-Based Costing will be used to model the proposed process.
6. *People*, this stage will explain about change management related to proposed solution.

Moreover, in documenting the process for analysis and implementation, UML Activity Diagram and Business Process

Model & Notation could be used [6]. Other tools such as Eventdriven Process Chain (EPC) is also recommended for documenting business process [7]. Some of BPM tools will be used in this research, such as business process model and notation, process selection matrix, and activity-based costing. Business process model and notation will be used to model the current and proposed of business process [5]. Meanwhile the process selection matrix will be used to describe the detailed activities for exam preparation and planning process in Operational BINUS Online Learning [5]. Activity-Based Costing is "The method of charging activity costs based on the cost of resources, costs and costs for costs, such as products or customers, measurement activities, and cost and performance measurement of using process and cost objects" [8]. Meanwhile, according to Amin Wijaya Tunggal [9], Activity-Based Costing is a costing method based on activities designed to provide cost information to managers to make strategic decisions and other costs that affect fixed costs and costs. The exam preparation and planning process will be broken down into some activities so, cost could be recorded in a detailed way [10][11]. By doing this, unnecessary cost can be monitored and taken as a consideration to propose a follow-up action [12][13].

IV. RESULT

The following is the result of the analysis performed:

a. Organization Strategy

Here is the organization's strategy in running distance learning:

- Interactive online learning by students with all lecturers and lecturers practicing intensively.
- Course Materials in the form of Lecture Notes, Power Point Presentation and Multimedia are made in digital format.
- Discussion forums conducted online are specifically designed for the students' virtual interaction with work groups and all lecturers, which are divided into: -Class Room: Discussion area for all class members related to the course.
  -Team Room: Discussion area provided so that all students can work group with their respective group.
- The provision of lecture materials and the collection of tasks is done very flexibly through every student's online access.
- Class conference that allows lecturers and students to interact in real time as in the classroom.
- Case study discussions through face-to-face meetings and execution of the exam are conducted in the last week at the end of each lecture period.
- The entire teaching-learning process is supported by modern facilities such as Integrated Learning Management System and Digital Library.

b. Process Architecture

BINUS Online Learning is a center in BINUS University that in charged for conducting the online learning program for higher education. *Organizational Process View* in Figure 1 shows the big picture of vision, missions, external stakeholders, core and supporting processes in BINUS Online Learning. Core processes in BINUS Online Learning consist of sequential process which related to its core business in providing the best online learning services experiences for students. They are processes that related to student intake, orientation, scheduling and learning activities, exam, thesis, and graduation. Meanwhile, some supporting processes are defined to know the processes that contribute in the succession of the core ones. Further discussion will only be limited to the process of scheduling & learning activities and exam, since both of the process seems to have some issues and problem in providing flexible services to students. In these two core processes, we'd like to highlight the activities that related to exam preparation and scheduling.

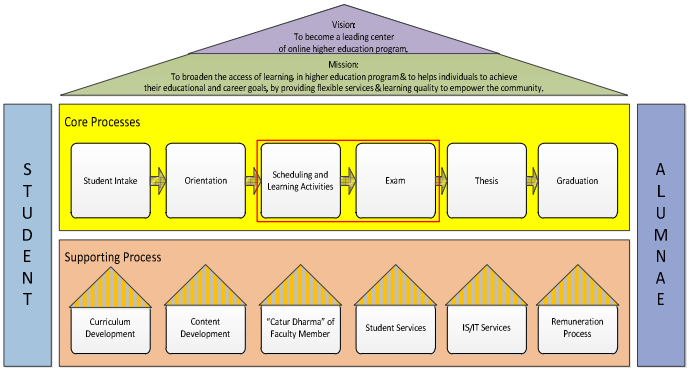

Fig. 1. *Organizational Process View of BINUS Online Learning*

c. Launch Pad

The collaboration of people, process, and technology in the current process of Exam Preparation and Scheduling can be seen in Table 1. The people or stakeholders of this process are divided into two groups, the one whose position are internally in BINUS Online Learning and other who are externally outside of BINUS Online Learning. The internal stakeholders consist of Scheduling Section Head, Operational Manager, Scheduling Staff, Deputy Head of Program, Head of Program, and Online Lecturer Coordinator. The external one consists of Subject Matter Expert and Copy Center.

As you can see in Table 1, many of the activities still depend on the Ms. Word, Ms. Excel, and Email, which are not integrated with the system of BINUS Online Learning. By this finding, it also can be pre-assumed that the process is reluctant to the incorrect data and information that caused by human-error, since the validity of the data and information in the process are very depending to the user.

TABLE I. PROCESS SELECTION MATRIX OF EXAM PREPARATION AND SCHEDULING

Process	Internal	External	Application Support
Exam Preparation and Scheduling	Query the list of exam course		BCS, Ms. Excel
	Set the schedule of the exam		LMS Back-End, Ms. Excel
	Approve exam schedule		LMS Back-End, Ms. Excel
	Send the exam schedule		Ms. Excel, Email
	Check the exam schedule for exam script collection purpose		Ms. Excel, Email
	Send the exam list for exam script collection purpose		Ms. Excel, Email
	Prepare the exam composition		Ms. Excel, Ms. Word, Email
	Send the exam composition		Ms. Excel, Ms. Word, Email
		Create the exam script	Ms. Excel, Ms. Word, Email
		Send the exam script	Ms. Word, Email
	Check the content of exam script		Ms. Excel, Ms. Word, Email
	Print the exam script		Ms. Word, Email
	Give the exam script		Ms. Excel, Ms. Word, Email
	Check the completeness of exam scripts		Ms. Excel, Ms. Word, Email
	Create a report of exam script collection		Ms. Excel, Email
	Approve report of exam script collection		Ms. Excel, Email
	Give the final exam script		Ms. Excel, Ms. Word, Email
	Give the final exam script for multiplying purpose		Ms. Excel, Ms. Word, Email
		Multiplying the scripts	Ms. Excel, Ms. Word, Email
	Create the exam package		Ms. Excel, Ms. Word
	Distribute the exam package		Ms. Excel, Ms. Word

d. Understand

The workflow of the process of Exam Preparation and Scheduling is shown in Figure 3.

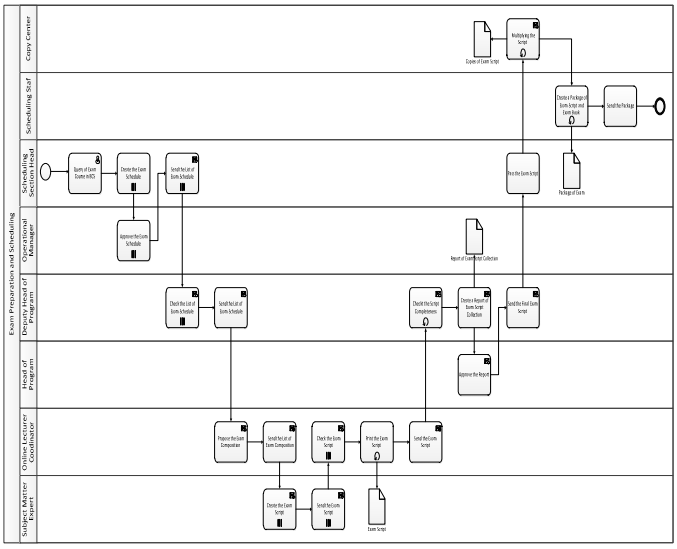

Fig. 2. BPMN for Current Condition

Figure 4 shows the detailed activities of the exam preparation and scheduling along with the time and cost of each of activity.

Activities	Times/Transaction/Day (Minutes)	Annual Cost (IDR)
Query the list of exam course	10	32,707.77
Set the schedule of the exam	300	981,233.11
Approve exam schedule	30	139,789.98
Send the exam schedule	5	16,353.89
Check the exam schedule for exam script collection purpose	180	588,739.87
Send the exam list for exam script collection purpose	5	16,353.89
Prepare the exam composition	1200	3,924,932.46
Send the exam composition	5	16,353.89
Create the exam script	360	750,000.00
Send the exam script	5	10,416.67
Check the content of exam script	4800	15,699,729.83
Print the exam script	400	1,948,819.48
Give the exam script	5	15,884.39
Check the completeness of exam scripts	180	588,739.87
Create a report of exam script collection	120	400,645.84
Approve report of exam script collection	30	139,789.98
Give the final exam script	5	15,884.39
Give the final exam script for multiplying purpose	5	15,884.39
Multiplying the scripts	2400	139,524,507.05
Create the exam package	900	2,006,199.34
Distribute the exam package	180	4,401,239.87
	11125	171,234,205.95

Fig. 3. Activity-Based Costing (ABC) for Current Condition

Based on the finding documentation of current condition of the process, some of issues are arouse:

1. There is lack of system control along the processes. The users still manually using Ms. Excel in do the recap of the documentation and report, which is very reluctant to the human error.
2. Control of system access is still low, since they still use email for exchanging any data and information along the processes.
3. Many of activities in the process that are costly and required much time to be executed, such as: prepare the exam composition, check the content of exam script, multiplying exam scripts, and create the exam package.

In order to solve the issues, an online exam application is proposed. This application shall integrate all of the activities along the exam process in one application. Every activity will be recorded and controlled by the application, so it could reduce human error and increase the security along the process. Hopefully the proposed application should also reduce the efforts needed to run the whole activities in exam process.

e. Innovate

Every activity of the exam process shall be run on the online exam application in LMS Back-End. Steps-by-steps of exam process in proposed condition are as below:

1. Scheduling Section Head set the schedule of the online exam.
2. Operational Manager approve the schedule
3. OLC will prepare the course exam composition.
4. OLC assigns the SME to create the online exam script

5. SME will create the online exam script.
6. SME will submit the online exam script.
7. OLC will check the content of the online exam script.
8. OLC will approve the content of online exam script.
9. Deputy HoP will check the completeness between the schedule and scripts.
10. Deputy HoP will create a report of online exam script that will be used.
11. Head of Program (HoP) approve the report.
12. Deputy HoP will submitthe scripts.
13. Scheduling Section Head set the readiness of the online exam.
14. Operational Manager finalizes the approval of online exam.

The collaboration of people, process, and technology in the proposed process of Exam Preparation and Scheduling are shown in Table 2.

TABLE II. PROCESS SELECTION MATRIX OF PROPOSED EXAM PREPARATION AND SCHEDULLING

Process	Internal	External	Application Support
Exam Preparation and Scheduling	Set the schedule of the online exam		LMS Back-End
	Approve exam schedule		LMS Back-End
	Prepare the exam composition		LMS Back-End
	Assign SME to create online exam script		LMS Back-End
		Create the online exam script	LMS Back-End
		Submit the online exam script	LMS Back-End
	Check the content of exam script		LMS Back-End
	Approve the content of online exam script		LMS Back-End
	Check the completeness of exam scripts		LMS Back-End
	Create a report of exam script collection		LMS Back-End
	Approve report of exam script collection		LMS Back-End
	Submit the online exam script		LMS Back-End
	Set the readiness of the online exam		LMS Back-End
	Approve the online exam		LMS Back-End

The people or stakeholders of this process are still the same. The people divided into two groups, the one whose positions are internally in BINUS Online Learning and other who are externally outside of BINUS Online Learning. The internal stakeholders consist of Scheduling Section Head, Operational Manager, Deputy Head of Program, Head of Program, and Online Lecturer Coordinator. The external one consists of Subject Matter Expert. Scheduling Staff and Copy Center are taken out from the list, since the proposed exam process will be run online. Because the process will be conducted in online environment, so there will be no processes of print the exam script, multiply the script, create and distribute exam package.

Proposed End-to-End Process Modeling

The Online Lecturer Coordinator (OLC) could do the development of online exam without wait the online exam schedule from the Scheduling Section Head. Later on, the Deputy Head of Program will act as the final checker for the online exam scripts availability based on the schedule from the Scheduling Section Head (Figure 4) .

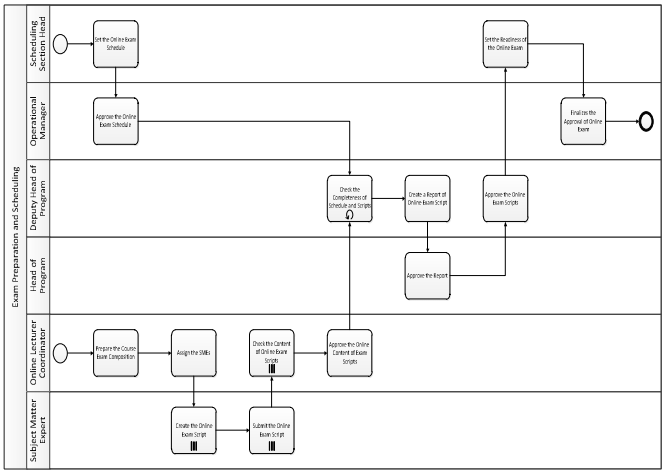

Fig. 4. Process Modeling for Proposed Exam Preparation and SchedulingProcess

Figure 5 shows the detailed activities of the proposed exam preparation and scheduling along with the time and cost of each of activity.

Activities	Times/Transaction/Day (Minutes)	Annual Cost (IDR)
Set the schedule of the online exam	150	490,616.56
Approve exam schedule	30	139,789.98
Prepare the exam composition	1200	981,233.11
Assign SME to create online exam script	5	16,353.89
Create the online exam script	360	750,000.00
Submit the online exam script	5	10,416.67
Check the content of exam script	4800	15,699,729.83
Approve the content of online exam script	400	1,308,310.82
Check the completeness of exam scripts	90	294,369.93
Create a report of exam script collection	5	24,360.24
Approve report of exam script collection	30	136,973.00
Submit the online exam script	5	16,353.89
Set the readiness of the online exam	5	16,353.89
Approve the online exam	30	4,339,789.98
	7115	24,224,651.79

Fig. 5. Proposed Activity-Based Costing (ABC)

f. People

Change Management Plan

Since the proposed online exam application will affect the current people, process, and technology, a change management plan should be developed to mitigate any issues that could be arouse. Some of the initiatives are as follows:

1. There should be data integration between BCS and LMS Back-End, so the academic schedule and calendar can be extracted by the LMS Back-End.

2. The design of proposed application should be followed with the development of some working procedures. The procedures should also be distributed to the related users or stakeholders.
3. Manual book should be created and training for the users and stakeholders should be conducted.

Above initiatives are only opening initiatives that should be put in change management plan. They should be adapted with the development progress of the proposed application.

V. CONCLUSION

Process of exam preparation and scheduling in BINUS Online Learning is still manual, that is very reluctant to *human-error*, and many activities are still using different applications and not all of them already integrated. Some of the activities in the process are also costly and require much time to be run. The proposed online exam application shall integrate all of the activities along the process. The proposed system shall have main features such as, create exam scheduling, create course-exam composition, create online exam script, maintain the exam script collection, and so on.

The proposed application delivers more efficient efforts in running the activities in exam preparation and scheduling (Table 2.). The proposed application shall save around 147,009,554.11 IDR or about 85,85%, meanwhile the new process will cut about 4,010 minutes or about 36,04% in running the activities for exam preparation and scheduling process. These big savings are resulted from the taking off of the multiplying scripts activity that costs 139,524,507.1 IDR in the current process. This could bring efficiency for organization [14] and so the savings can be allocated to other process that might needed. All of the calculations are not included with the estimation of early investment for the proposed application.

TABLE II. COMPARISON OF CURRENT AND PROPOSED ACTIVITY BASED COSTING (ABC)

Components	Before	Proposed	% Savings
Annual Cost (IDR)	171,234,205.9	24,224,651.79	85.85%
Times Needed (Minutes)	11,125	7,115	36.04%

For further research, other step (Develop, Implement, Realize Value, and Sustainable Performance) will be run as a plan for the next stage. The application model that shall be developed, should also aware about maintaining the security and academic quality aspect of the online exam. If the scope of the application would like to expanded, be sure to involve the lecturers and students for system requirements gathering. Furthermore, the utilization of the proposed applications should be integrated with the KPI for related unit that responsible for the succession of the application [15].

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