APPLICATION OF WORK BREAKDOWN STRUCTURE (WBS) AND GANTT CHART ON THE PROJECT OF COMPOSING CURRICULUM MERDEKA BELAJAR KAMPUS MERDEKA

Rizal Ramdan Padmakusumah[1)], Entol Suraji[2)], Muhammad Khoirul Umam[3)]

[1)]Widyatama University, Bandung, Indonesia
[2)]Widyatama University, Bandung, Indonesia
[3)]Widyatama University, Bandung, Indonesia

[1)]rizal.ramdan@widyatama.ac.id, [2)]entol.suraji@widyatama.ac.id, [3)]khoirul.umam@widyatama.ac.id

Abstract

The Revision of Compilation Curriculum Merdeka Belajar Kampus Merdeka (Proyek MBKM) is a Strategic Project for the Widyatama University Undergraduate Management Study Program. The purpose of this research is to try to apply the operations management method, namely the work breakdown structure (WBS) and Gantt Charts as a tool in scheduling and calculating the completion time of the MBKM Project. This type of research is a qualitative research. The data analysis method is using WBS and Gantt Charts combined with Focus Group Discussion (FGD). The results showed that the calculation of project completion time without the use of a combination of WBS and Gantt Chart methods resulted in a longer project completion time calculation. The conclusion of this research is that WBS and Gantt Chart are very helpful in scheduling and calculating project completion time better and more accurately.

Keywords: work breakdown structure, gantt chart, project, composing curriculum

Introduction

Widyatama University Undergraduate Management Study Program is one of the mainstay study programs of Widyatama University. The number of active students from this study program reaches + 2500 students. The number of active lecturers is recorded as 90 lecturers. The number of study program managers is 4 people who are directed by 2 faculty leaders. The number of students and lecturers is large compared to the number of managers, so of course this requires managers to work effectively and efficiently. Various work programs need to be completed by the Study Program, both routine and incidental work programs. One of the important and incidental work programs for the Study Program is the Preparation of the Independent Learning Curriculum for the Independent Campus (MBKM). The preparation of this curriculum is in order to perfect the MBKM Curriculum which is already owned by the Widyatama University Undergraduate Management Study Program (V. S. Marinda, Personal Communication, November 01, 2021).

The preparation of composing the Merdeka Belajar Kampus Merdeka curriculum is certainly as a project for Study Program managers, therefore in this study the preparation of the MBKM curriculum will hereinafter be referred to as the MBKM Project. The MBKM project involves various elements who are members of the MBKM Team. The MBKM team consists of representatives of the Rector, Faculty representatives, Study Program Managers, Academic Representatives, and Lecturer Representatives. Based on the Dean's assignment letter, the MBKM Team must complete the MBKM curriculum at the end of the even semester of the 2021/2022 Academic Year (Mariana, 2021).

In order for the project completion target for the MBKM TEAM to be clearer and faster, then of course they can use the tools or methods that exist in project management. Some practical and effective methods that are often used to determine the completion time as well as project scheduling are Work Breakdown Structure (WBS) and Gantt Chart (Tampubolon, 2014). This study aims to test whether WBS and Gantt Chart will help in determining project time and project scheduling on non-manufacturing types of projects, especially projects in the implementation of education in universities.

Literature Review

Work Breakdown Structure - (WBS)

To determine the completion time as well as project scheduling, one of the most important steps is to create a Work Breakdown Structure – WBS (Tampubolon, 2014). WBS is useful for identifying or determining a list of activities that must be carried out to complete a project (Heizer and Render, 2012). The WBS will help management identify the main activities and then break them down into more detailed sub-activities (Satzinger, et al., 2012). Another function of the WBS is to divide the project into smaller components or activities so that it is easier to manage (Marchewka, 2015). According to Lei SU (2012) the stage of making WBS if simplified then consists of 4 (four) stages, namely (1) determining the main activities, (2) identifying the required budget, (3) identifying the types of activities that need to be carried out, and (3) identifying necessary monitoring activities.

Gantt Chart

Gantt Chart is a project scheduling diagram (Heizer and Render, 2012). Gantt charts assist management in determining (1) whether all activities have been planned, (2) the sequence of work or activities in the project, (3) the estimated time of each activity, (and (4) project completion time (Heizer, Render, & Monson, 2007). 2012).Gantt Chart helps management or team see when the project starts and ends in a visual graphic display (Tampubolon. 2014).The components or complete display of the Gantt Chart according to Ulfianinda (2021) include (1) a list of tasks, (2) the start and end date of an activity, (3) the person in charge of an activity, (4) the work that must be completed now and in the future, (5) the work that has been completed, (6) the extent to which the task is completed by the person in charge, (7) important dates or agendas that must be done, and (8) linking interdependent tasks.In this study, for simplicity in analysis, the Gantt Chart component used is the how-to component. g is used in Heizer and Render (Heizer & Render, 2012).

Methods

This research is a type of qualitative research (Arikunto, 2006). The data used in this study used two sources of data, namely secondary data and primary data (Sugiyono, 2008). Secondary data used in the form of Work Programs, Annual Reports, Academic Guidelines, Government Regulations, Laws and others. The primary data used are the results of interviews, questionnaires, discussions, and observations. The main data source in qualitative research is primary data (Jogiyanto, 2010), so that in this study qualitative data is more dominantly used in analysis and determining conclusions.

In analyzing the primary data in this study, the Work Brekdown Structure - WBS method (Heizer & Render, 2012) and Gantt Chart (Tampubolon, 2014). These two methods are used because they are relevant to the title or purpose of the research conducted, namely determining the project completion time and scheduling the project (Tampubolon, 2014). The WBS used in this study is limited to only one level of activity, namely the main activity and is not divided into more detailed components or sub-activities. The results of the WBS and Gantt Chart analysis were then tested by the project team through the steps or activities of Focus Group Discussion or FGD which were carried out in several sessions.

The object of research or unit of analysis is the Widyatama University Undergraduate Management Study Program, while the research observation unit is the Independent Curriculum Development Project Team for Independent Campus Study (MBKM) at the Widyatama University Undergraduate Management Study Program. Respondents or Project Teams from this research consist of all Study Program Managers, Representatives of Senior Lecturers, Representatives of the Center for Academic Development, Representatives of Expert Lecturers in the Field of Entrepreneurship, Representatives of Expert Lecturers in the International Business Sector, Representatives of Expert Lecturers in the Field of Marketing, Representatives of Expert Lecturers in the Field of Operations, Representatives of Expert Lecturers in the Field of Human Resources, Representatives of Expert Lecturers in the Field of Finance (Mariana, 2021).

Resultes and Discussions

Work Breakdown Schedule – WBS Proyek MBKM

Based on the results of interviews with representatives of the Project Team, a table detailing MBKM Project activities is presented as follows:

Tabel 1.Work Breakdown Structure (WBS) for MBKM Project

No	Activities	Activities Descriptions	Direct Predecsessor	Timeline (Day)
1	A	Team Building	-	7
2	B	First Team Meeting	A	3
3	C	Merger and subtraction of courses (core courses in semester 1 to 5)	B	7

4	D	Preparation of cross-study courses (semester 6)	C	4
5	E	Preparation of courses for off-campus activities (courses for semester 7 & 8)	D	7
6	F	Preparation or revision of course RPS	E	7
7	G	Preparation of cross-study programs guidelines	F	7
8	H	Preparation of lecture guidelines for out off-campus activities	G	7
9	I	Preparation of the MBKM curriculum draft by Study Program	H	7
10	J	Ratification of the final draft of the MBKM curriculum by the Dean	I	3
11	K	MBKM curriculum socialization to academics	J	3
12	L	Socialization of the MBKM curriculum to lecturers and students	K	3
Project Completion Time				65

Source : interview (2021)

Referring to table 1. it can be seen that the number of main work that must be done to complete the MBKM Project is 12 activities. The fastest time to complete an activity in the project is 3 days and the longest time to complete an activity in the project is 7 days. The total time for completion of the MBKM Project refers to the calculation in the table above, which is 65 days (< 3 months). The project completion time of 65 days is generated with a note that each work is carried out sequentially or in other words each activity becomes a precursor to the next activity (J. H. Wijaya, Personal Communication, November 01, 2021).

Gantt Chart Proyek MBKM

The table below presents a Gantt Chart of the MBKM Project completion time referring to the WBS in table 2. Above with a project completion time of 65, namely:

Table 2. Gantt Chart of MBKM Porject

Activities Description		Timline (In a Day)	Day												
			1	2	3	4	5	6	...	60	61	62	63	64	65
A	Team Building	7							...						
B	First Team Meeting	3							...						
C	Merger and subtraction of courses (core courses in semester 1 to 5)	7							...						
D	Preparation of cross-study courses (semester 6)	4							...						
E	Preparation of courses for off-campus activities (courses for semester 7 & 8)	7							...						
F	Preparation or revision of course RPS	7							...						
G	Preparation of cross-study guidelines for study programs	7							...						
H	Preparation of lecture guidelines for off-campus activities	7							...						
I	Preparation of the MBKM curriculum draft by Study Program	7							...						
J	Ratification of the final draft of the MBKM	3							...						

	curriculum by the Dean													
K	MBKM curriculum socialization to academics	3							...					
L	Socialization of the MBKM curriculum to lecturers and students	3							...					

Source : Interview (2021)

The calculation of the total time for the completion of the MBKM project with Gantt Charts as shown in Table 2. above has one weakness, namely that each activity has to wait for the previous activity, which in fact there are several activities can be carried out without having to wait for the previous activity so that these activities can be carried out earlier (so that the project completion time will also be automatically faster). Some of the activities that can be carried out earlier include activities (G) preparation of lecture guidelines across study programs and activities (H) preparation of guidelines for off-campus lecture activities (MBKM activities). By adjusting the two activities, the Gantt Chart for the completion of a new project can be rearranged as presented in table 3. Below:

Table 3.Gantt Chart MBKM Project (Adjustmen of Activity G dan H)

Activities Description		Timline (In a Day)	Day												
			1	2	3	4	5	6	...	48	49	50	51	52	53
A	Team Building	7							...						
B	First Team Meeting	3							...						
C	Merger and subtraction of courses (core courses in semester 1 to 5)	7							...						
D	Preparation of cross-study courses (semester 6)	4							...						
E	Preparation of courses for off-campus activities	7							...						

	(courses for semester 7 & 8)													
F	Preparation or revision of course RPS	7							...					
G	Preparation of cross-study guidelines for study programs	7							...					
H	Preparation of lecture guidelines for off-campus activities	7							...					
I	Preparation of the MBKM curriculum draft by Study Program	7							...					
J	Ratification of the final draft of the MBKM curriculum by the Dean	3							...					
K	MBKM curriculum socialization to academics	3							...					
L	Socialization of the MBKM curriculum to lecturers and students	3							...					

Sumber : Focus Group Discussion or FGD (2021)

Table 3. Above shows clearly that with the revision regarding the start time of work G and H, this has an impact on the faster project completion time, which is 53 days (originally 65 days). The difference in the total project completion time from the previous calculation is 12 days (65-53 days). 12 days is quite a time saving. 12 days can be used by the team for various purposes, for example (1) conducting overall revisions, (2) conducting socialization, (3) anticipating delays in the ratification and administration process, and (4) other things, both predictable and unpredictable. suspected.

Conclusions

The preparation of the Work Breakdown Schedule (WBS) and the use of the Gantt Chart greatly helped the MBKM Curriculum Development Project Team for the S1 Management Study Program at Widyatama University, especially in determining the project completion time. The WBS assists the team in identifying the various activities required to complete the project. The Gantt Chart helps the team to determine the overall project completion time as well as to determine the completion time of each work element in the project more precisely. The Gantt Chart also enables the team to identify which project activities can or need to be revised. In the case in this study, the activity (G) of preparing cross-study course guidelines and the activity (H) of compiling MBKM activity guidelines, both were identified as being able to speed up the processing time by making each process into two stages.

The managerial suggestion from this research is that the project team, in addition to using WBS and Gantt Chartt for MBKM project scheduling and projects, can also be supplemented by using the CPM (Critical Path Method) and PERT (Program Evaluation and Review Technique) methods. CPM will assist the project team to identify critical paths or project activities that should not be delayed. PERT will help the project team provide various estimates of the project completion time under three conditions, namely (1) optimistic time, (2) pessimistic time, and (3) most likely time. Academic and scientific suggestions for future research, it seems that project management research in the service sector, especially education or higher education, needs to be expanded. What things need to be adjusted so that project management methods originating from the manufacturing sector can be applied and significantly benefit the service sector, especially in the provision of higher education services.

References

Arikunto, S. (2006). *Prosedur penelitian: suatu pendekatan praktik*. Jakarta: PT. Rineka Cipta.

Heizer, J & Render, B. (2012). *Manajemen operasi (buku 1 edisi 9 terjemahan)*. Jakarta: Salemba Empat:

Heizer, J., Render, B., & Monson, C. (2017). *Principle of operations management: sutainability and supply chain management*. Edinburgh Gate: Pearson Education Limited.

Jogiyanto. (2010). *Metodologi penelitian bisnis : salah kaprah dan pengalaman-pengalaman*. Yogyakarta : BPFE-Yogyakarta.

Marchewka, J. T. (2015). *Information Technology Project Management. 5th ed*. Hoboken: John Wiley.

Mariana, R. A. (2021) Surat Tugas Nomor : 101/ST/FEB-UTAMA/X/2021

Satzinger, J. W., Jackson, R. B. & Burd, S. D. (2012) *System Analysis and Design in a Changing World*. *6th ed*. Boston: Joe Sabatino.

SU, Lei. (2012). WBS-Based Risk Identification for the Whole Process of Real Estate Project and Countermeasures, National Conference on Information Technology and Computer Sciencs (CITCS 2021).

Sugiyono. (2008). *Metode Penelitian Bisnis: Pendekatan Kuantitatif, Kualitatif, dan R & D*. Cetakan ke-11. Bandung: Alfabeta.

Tampubolon, M. P., (2014). *Manajemen Operasi dan Rantai Pemasok: Operation and Supply Chain Management*.Jakarta : Mitra Wacana Media.

Ulfianinda, T. (2021). https://www.mas-software.com/blog/gantt-chart-adalah-komponen#2-daftar-tugas. Accessed, november 06, 2021.