

Application of Time Management and Estimation of the Critical Path for the Project of Digitizing the Resources of King Abdullah University Library at Umm Al-Qura University

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Abstract. University libraries are the most important structures that serve the interests of scientific research and university branches to determine whether they are scientists, and students for their sources of information in various fields. In this study, we tried to study the digitization project of the University Library in the light of the implementation of time management for the project, which set out the principles for the project to understand the sequence of actions, monitoring, and problems with the timing. Electronic Library of King Abdullah University of models, such as one of the leading libraries in the Kingdom of Saudi Arabia. The aim of this study was to answer the following questions:

- How much time is required to complete the digitization project sources, King Abdullah bin Abdul Aziz Library of Umm Al-Qura University?
- What is the critical path that must be more carefully monitored to ensure that the project will not exceed the period of time the project management?

Keywords: the Project of Digitizing, University Library, time management, critical path, Pert diagram.

Introduction

University Libraries are the most important facilities that serve the interests of the scientific research and the affiliates of the university whether they are academicians or students because of its information sources in various fields. With the development of technology, it helps expand the activity of these libraries and develop such activity to allow greater knowledge to be available. Therefore, projects of digitizing those libraries and such projects need in turn to be controlled through the project management. When the project is achieved on time, we avoid wasting resources, budget and deliver the projects on time because the wasted time is translated into a loss of resources (Nigm, 2010). In this study, we

will try to examine the project of digitizing university libraries in the light of applying time management of the project by setting a timetable for the project to help understand the sequence of activities, control and face the problems of timekeeping. Digital Library of King Abdullah University will be a model as it is one of the leading libraries in the Kingdom of Saudi Arabia.

Study Objectives:

This study aims to describe and analyze the timetable for implementing the project phases of digitizing the digital library of King Abdullah bin Abdul Aziz university at the Umm Al-Qura university for being one of the leading libraries in implementing the projects of digitizing the resources through setting a timetable for the project activities which allow time management of the project as planned from the beginning of the project till its end.

Study questions:

This study aims to answer the following questions:

1. How much time is required for implementing the project of digitizing the sources of King Abdullah bin Abdul Aziz library at Umm Al-Qura University?
2. What is the critical path that should be controlled more accurately in order to guarantee that the project wouldn't exceed the determined time within the framework of project's time management?

Study limitations:

This study is limited to identify the duration of implementing the project of digitizing the resources of King Abdullah bin Abdul Aziz university library at Umm Al-Qura University at its first, second and third phases without tackling its fourth one. This goes back to the fact that the first three phases are associated with the processes of digitizing the resources directly. However, this study doesn't tackle the process of creating the electronic gate.

Methodology and Study tools:

This study will depend on the approach of case study through the formal documents related to the project, In addition to the interviews held with the officials who are responsible for implementing the project, the visits paid to the location of the library and browsing its available services on the internet.

Models of digitizing university library project:

Some of the leading Arabic and global experiences associated with digitizing university library projects are:

Prince Abdul Kader University digital library in Constantinople: since the beginning in 1992 the project of this library aimed to provide the community of users with modern informational services within an electronic environment that copes with the world of information technology industry through all its technical processes and applying automatic systems. This project is achieved through contracting with a specialized supplier in digitizing projects and automatic operation of the library within a digital system whose content is available through internet (Mounir, 2010).

Cornfield university library in Britain: the system of such library provides services through internet, the programs of learning users through virtual introductory rounds. In addition, this system provides referential and advisory services. The library participates in many databases (3000 database) as well as the resources of the educational fields available at the university (Iles, 2004).

French national library: this project was established in 1994. It aimed to develop digital groups and make these groups available for users depending on the available resources at the library as well as extending processes of availability on the internet through Gallica library. The library made full use of many experiences and specialists in computers and digitizing processes (Abdul Hady, 2011).

Mercury library project: the project of mercury library of Kringy University was established in 1992 G. In New Zealand, Waikato University established a project of digital library providing access to the contents of this library with its various fields through the direct line (Al-Malky, 2009).

Most of the literature reviews discussed digitizing library projects from the perspective of introducing information science, while this study will focus on digitizing libraries project from the perspective of projects management according to setting timetable for implementing the project.

Study terminology:

Digitization:

It is the process of turning data into a digital form in order to be processed through computers. Within the context of information systems, digitization usually refers to transforming printed texts or photos into binary signals using a sort of scanning devices which allow showing the results of such process on computer's screen (Abdul Kader, 2010).

Digital Library:

This term is defined as "a group of digital or electronic resources available on a server and accessible through either local or electronic network" (Farag, 2005).

Project Management:

This term refers to using knowledge, skills, tools and methods necessary for meeting the requirements of project activities (PMI, 2008).

Project Time Management:

It includes the processes required for project management and competition at the determined time representing in determining and sequence of activities, estimation of activity resources, estimation of the activities duration and as well as setting and monitoring a timetable (PMI, 2008).

Critical Path:

The definition of the critical path:

The Critical path is analysis and representation of the tasks necessary to complete the project, and the time of completion of each task and the overlap between these tasks.

The Importance of Critical Path:

This tool helps to control the activities of the project and the task sequence and to know the total time of the project, And gives vision for the project schedule.

The project of King Abdullah Bin Abdull Aziz University digital library:

1- Project description:

- **Project scope:** the main focus of the project is to turn all scientific printed resources and manuscript of Umm A-Qura University as well as all Saudi universities into the digital form that can be controlled through the automatic system of managing digital groups.
- **Stakeholders:** they are the deanship of library affairs, digital library management, technicians of network management, programmers of JAVA, employees of library affairs deanship and the academicians whether professors or students.

Project budget: the project was allocated a budget of about (422400) SAR.

Transforming (7000) written dissertation equivalent to (3500000) paper into the digital form including:

1. Dissertations that are on laserdisc and have no paper copies approx (183) laserdisc are entered and catalogued in the system.
2. (791) paper dissertation were scanned and indexed.
3. (1347) photocopied manuscripts were scanned. The number of manuscripts that are on microfilms is (1992).

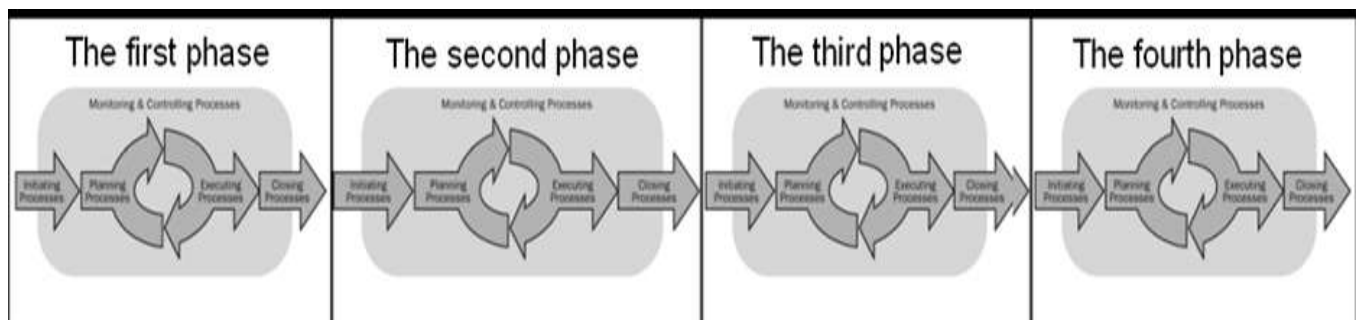
2- Project goals:

- Digitizing information resources of the university such as (dissertation, publications, scientific magazines, conference papers and university prints).
- Providing academicians with services through making electronic resources of information available on the internet.
- Saving information resources possessed by the university on electronic medias that can be retrieved, transferred and processed electronically.
- Providing users with information wherever they are without being obliged to go to the university library.
- Expanding the creation of new digital groups as per the requirements of the university and its affiliates (Umm Al-Qura University, 2013).

3- Project phases:

The project of digitizing king Abdullah university library is divided into four phases distributed as follows:

Figure (1) shows the work steps in the project phases



The first phase: it includes choosing and preparing the appropriate automatic system in order to manage the digital group, identifying and choosing the devices suitable to the process of digitization and starting with the dissertations during the process of digitization. This phase contains also setting the standards and specifications of digitizing the dissertations as well as preparing the dissertations in order to be scanned.

The second phase: it focuses on turning all the printed matters of the university into the digital form, which allows controlling such materials through the automatic system of managing the digital group chosen and prepared during the first phase of the project.

The third phase: it includes identifying the policies followed on transforming university manuscripts into a digital form, in addition to setting the standards and specifications of digitizing these university manuscripts as well as turning these into a digital format and preparing them according to user's system.

The fourth phase: it focuses on establishing an electronic gate for king Abdullah bin Abdul Aziz university library on the internet. The importance of electronic gate lies in its being a link connecting users to digital library's resources as well as a medium which provides other librarian services.

Timetable of digital library resources:

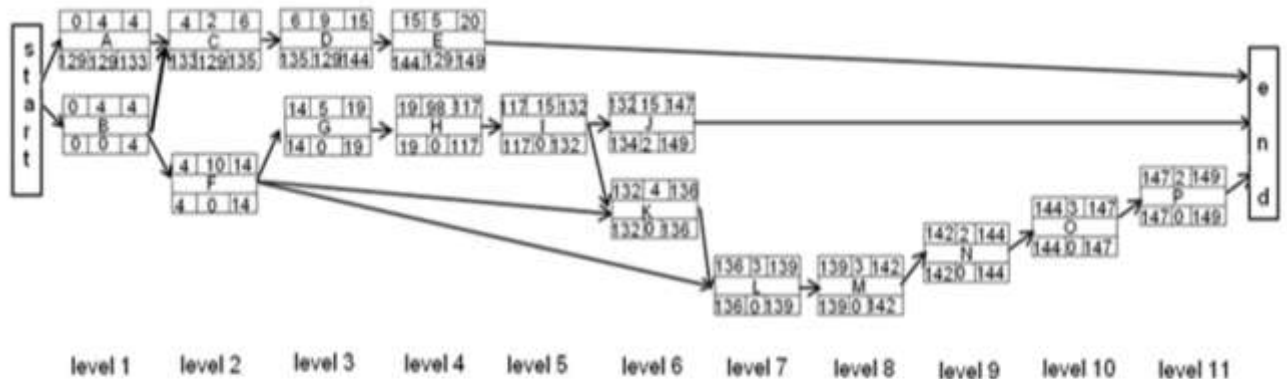
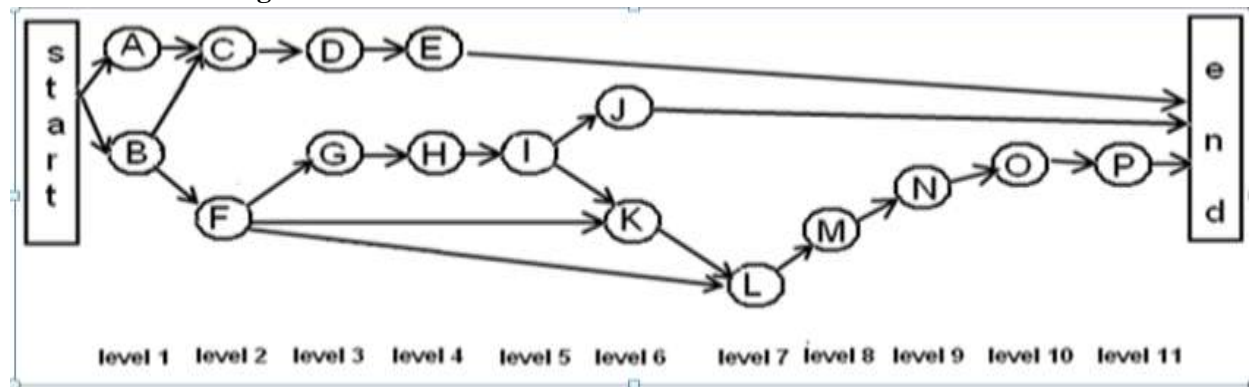
As this study will focus on the first three stages, the total duration of the processes was comprehensively estimated for each one, worth mention, the processes are overlapping and it's not conditional for the nest process to wait for staring the new one. Thus, the following table was prepared for illustration:

Activity	Activity	Predecessor	Optimistic time (days)	Most likely time (days)	Pessimistic time(days)	Expected Time "Duration"
A	Determining the appropriate specifications to select the appropriate automatic system for digital groups' management.	–	3	4	5	4
B	Determining the standards and the specifications for digital transformation process for university dissertations.	–	3	4	5	4
C	Determining the suitable and appropriate devices and the equipments required to the digital transformation process.	A ,B	1	2	3	2
D	Providing the photocopiers, scanning devices and the automatic system.	C	6	9	12	9
E	the system should be translated into Arabic to be agreed to Arabic	D	2	5	8	5
F	Sorting the scientific resources to electronic and paper resources.	B	5	10	15	10

G	Removing bookbinding.	F	4	5	6	5
H	Scanning the paper resources by scanner.	G	92	96	112	98
I	Reviewing and monitoring scanning process.	H	10	15	20	15
J	Rebook binding the scientific dissertations.	I	10	15	20	15
K	Recollecting the electronic files of the scientific resources that not agreed to the library conditions at one file which agreed to the library conditions.	F,I	3	4	5	4
L	Converting the files to PDF format.	F,K	2	3	4	3
M	extracting the required pages as (cover, introduction that including the research plan, the abstract and index of subjects) and put it in file named ind+Num Tiss	L	2	3	4	3
N	Saving the files in the appropriate partitions.	M	1	2	3	2
O	Recording the index card of scientific resources as the united Arabic index specifications.	N	2	3	4	3
P	Adding the electronic link to the electronic file to be showed through the index.	O	1	2	3	2

1- Pert diagram:

2- Network Diagram:



Forward
Forward Pass

← Pass

3- Critical path: CP=B .F .G .H .I .K .L .M .N .O .P

The duration required for the implementation of the project is (149) days.

According to the processes, the critical path is the one that goes through the following processes:

- 1- Setting standards and specifications of digital conversion of digitizing dissertations.
- 2- Sorting scientific resources into paper and electronic resources.
- 3- Removing bookbinding.
- 4- Scanning paper resources.
- 5- Revising the process of scanning.
- 6- Recollecting the non-harmonized electronic files of scientific resources into one file conformed to the library provisions.
- 7- Converting the files into (PDF) format.
- 8- Extracting the required pages such as (cover, introduction which includes research plan, summary and subjects index) and putting these pages in a file entitled (ind+Num TISS).
- 9- Saving files in their specified locations.
- 10- Recording the indexes cards of scientific resources according to the specifications of the unified Arabic catalog.
- 11- Adding the electronic link to the electronic file so as to be shown easily through the catalog.

Results:

- It is revealed that the duration estimated for implementing the first three phases of the project of digitizing king Abdullah's university library is between (5:6) months.
- The critical path of the activities of king Abdullah digital library lies in the activities B .F .G .H .I .K .L .M .N .O .P.
- Comprehensiveness of the followed phases in the project and sequences as per the prior specified timetable.

Recommendations:

- Expanding the establishments of digital libraries, as a result of their importance and large capability to achieve the effective retrieval.
- Setting a timetable for the projects of digital libraries illustrating the serialization of the activities, controlling practices, achieving high quality and ensuring the efficiency of the determined time.
- Complying with project's timetable that facilitates implementing the project and completing work on it at the specified time, and thus such timetable helps avoid wasting materials and discovering the lost activities.

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