Chapter Six

TIME, LOCATION AND CONTENT REQUIREMENT ANALYSIS OF THE COLLABORATIVE DIGITAL LIBRARY

6.0 Introduction

This chapter presents information on the current process of handling the history projects in the case school, which includes an examination of the time, location and content involved to understand the policy context that affects design, management, implementation and use of the collaborative digital library. This information provides useful input to formulate the requirement matrix in the digital library framework, namely data, function, location and time, that populate the cells in the Zachman Approach used. The data collected for this chapter is obtained from:

(a) the six teachers interviewed;
(b) the History Room visits;
(c) the Self-Access Learning Centre (PRS) Room visits;
(d) the contents of past History projects;
(e) the contents of official documents and forms from the Ministry of Education and the case school.

6.1 Processes and Procedures Related to Time in Handling the History Project

Time refers to the time frames involved in conducting the history project, such as choosing topic, searching for information, writing, publishing, submitting and grading project work. The responses obtained from all teachers regarding the processes and procedures were
consistent with one another. The school’s History Panel adheres to a specific procedure in handling the History Project as recommended by the District History Unit and the Curriculum Development Centre, Ministry of Education. Soraya who is the Panel Head of History indicated that the Secondary Three students were given a general topic in February, and they were given a week to think about the topic that they would like to write on and report back to their History teachers. Teachers have to make sure that “there are not too many similar project titles” (Soraya). For security purpose, students were encouraged to conduct the information gathering activities in groups, such as interviewing resource persons or the prominent personality, visiting historical sites and building, going to libraries, archives and other information and government agencies. However, the report must be written and submitted individually. Teachers allow eight weeks for students to conduct their project in terms of gathering information sources and most of them estimate that the students take four weeks to produce the actual report. Students have to submit their report at the end of April, normally after the first semester school break.

Teachers do allow similar project titles, and they keep track of students’ progress to “make sure that students do not duplicate others’ work” (Ashraf); to ensure that they can produce the report on time (Mastura and Soraya); to monitor the contents and language (Nora); to ensure that the students use enough and authoritative resources to write (Roslina); and to make sure that students get accurate and reliable information and have different style of writing based on a similar source (Luqman). Roslina said that her students were given feedback about their progress from time to time. Roslina showed her method of monitoring students progress of which she put her initials against the students name list in her record book when her students brought to her the resources they used for their project.
The teachers provide their students with two specific guidelines to conduct their research and produce the project report: *Carta Aliran Kerja* (Flowchart) and *Panduan Menulis* (Writing Guidelines). All teachers grade and annotate their students report by writing comments and underlining mistakes. Grades are submitted to the Panel Head in July. Students are normally informed of their grade in September. All reports are kept for at least one year with the teacher, and returned to the students the following year. The “A” reports are kept in the History Room for reference and depository purpose. The teachers did not collaborate at all with one another in handling the students’ project. At various points of the interviews, teachers expressed the feeling that at school, even during breaks, teachers do not collaborate much or just get to know each other. The teachers however were appreciative of the opportunities their participation might provide for them to work together in handling students projects and to learn what teachers and students in other classes were doing. For example, Ashraf thought it was helpful both to see what “the other Form 1 and 2 students are doing and to see what older (Form 3) students would be able to accomplish in their project, as well as to get an idea about the types of knowledge and skills teachers could expect incoming students from lower forms (Forms 1 and 2) to possess. Luqman valued collaboration with his peers and mentioned its importance for providing ideas for activities, comparing student outcomes, discussing content knowledge and sharing success stories as well as materials and resources with one another. Luqman identified additional time to work together as the most important factor for success in collaborative work such as the usage of the digital library for school projects.

Table 6.1 presents the chronology of events indicating the processes that take place in the implementation of the PMR History Coursework for two consecutive years, 2004 and 2005. This information is useful to translate the events to which the digital library responds in
relation to time required to populate the Time (When) cell of the Zachman Framework used (see 7.9).

### Table 6.1
Chronology of Events in the Implementation of PMR History Coursework in 2004 and 2005

<table>
<thead>
<tr>
<th>Processes and Procedures</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher’s briefing of the KST project work</td>
<td>1 day</td>
<td>2nd week</td>
<td>---</td>
</tr>
<tr>
<td>Students choose topic and report to teacher</td>
<td>7 days</td>
<td>3rd week</td>
<td>4th week</td>
</tr>
<tr>
<td>Students conduct information gathering activities and report progress to teachers</td>
<td>± 60 days</td>
<td>Feb</td>
<td>April</td>
</tr>
<tr>
<td>Students prepare their report</td>
<td>± 30 days</td>
<td>March</td>
<td>April</td>
</tr>
<tr>
<td>Students submit hardcopy of project report</td>
<td>7 days</td>
<td>3rd week</td>
<td>4th week</td>
</tr>
<tr>
<td>Teachers collect hardcopy of students work</td>
<td>7 days</td>
<td>3rd week</td>
<td>4th week</td>
</tr>
<tr>
<td>Teachers evaluate and grade students work</td>
<td>± 60 days</td>
<td>May</td>
<td>June</td>
</tr>
<tr>
<td>Teachers compile and generate students marks and grades</td>
<td>7 days</td>
<td>3rd week</td>
<td>4th week</td>
</tr>
<tr>
<td>Teachers submit grades to Panel Head</td>
<td>1 day</td>
<td>End of July</td>
<td>---</td>
</tr>
<tr>
<td>Panel Head submit grades to District Education Department</td>
<td>1 day</td>
<td>End of July</td>
<td>---</td>
</tr>
</tbody>
</table>

### Processes and Procedures Related To Place in Handling the History Project

Site visits involve inspecting locations of computers with Internet access, which can be used by students for curricular purposes, and the History room where students project works are deposited. Besides the History room, the researcher by chance found that another
location where exemplary students projects are exhibited and referred to is the PRS (Pusat Rujukan Sumber or the Self-Access Learning Centre) room. For the visits, information was gathered with regards to three facets of the user needs assessment. These facets are:

(a) Content: What materials are housed in these locations, what indexes or finding aids exist, and which materials, apart from the students project could be scheduled for possible inclusion in the collaborative digital library.

(b) Users: The types of users who typically used these rooms and their purposes of doing so.

(c) Strategies: How do users search for information in these rooms, and the types of search tools available.

6.2.1 Observations from History Room Visits

Teacher interviews indicated that the project reports, upon submission, are first kept by the teachers in the staff room to be graded. Teachers would then bring the reports to the History Room, which is actually a classroom situated on the top floor (Third Floor) of the main building where the project reports are kept for at least five years. The teachers bring exemplary reports to the classrooms to show to their students. Soraya admitted that she seldom brought her students to the History Room as “coming here takes time as it is a bit far from the other classes, and I normally take the good reports to show the students”. The reports are not kept in the school library, and this was confirmed by the History teachers. The researcher visited the History Room twice. It was observed that the History Room might present huge challenges to those who wanted to find relevant information or refer to previous students project work due to the reasons extracted from the observation notes (Table 6.2). For instance, the researcher faced difficulties in searching and locating project report on a specific topic (for example, Tun Abdul Razak, Malaysia’s Second Prime
Minister) or subject (for example, historical buildings). The teacher could not locate work by a specific student’s name. It seemed to the researcher that missing reports cannot be located as there is no indication that the student projects are recorded if they are brought out from the History Room. The thirty reports borrowed by the researchers, for example are not recorded. The observation made from the visits justifies the need for a digital library of students project and implies that interfaces to the collaborative digital library must be driven by content decision as well as users’ needs. The researcher compiled a list of content-related interface challenges to be addressed in the digital library prototype based on the observation. Table 6.2 gives samples extracted from the researcher’s observation notes and the corresponding digital library design implication. This information also helps the development of user requirements expressed in terms of Function (How) in the Zachman framework used (see 6.7).

Table 6.2
Samples from Observation Notes and Corresponding Design Implications

<table>
<thead>
<tr>
<th>EXTRACT FROM OBSERVATION NOTES</th>
<th>DESIGN IMPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The room houses all PMR history projects from 1999 – 2004, estimated about 1800 reports. Other materials kept in the room are maps, charts and students’ projects in the form of models, posters and brochures.”</td>
<td>The interface must communicate to the user the types of resources contained in the collaborative digital library. Users should get help using thoroughly written documents and online help that is clear, intuitive and easy to use. The system should be able to link relevant resources held outside the digital library itself.</td>
</tr>
<tr>
<td>“The students’ project reports are arranged on shelves by year of completion, by grades and by subject teachers. Only A projects are kept on the shelves; others are kept in the closed cabinets below the shelves.”</td>
<td>The interface must communicate to the user the levels some form of document arrangement such as in terms of resource type and year.</td>
</tr>
<tr>
<td>“The collection consists of three main themes: famous personality in Malaysian history; historical buildings; historical events.”</td>
<td>Contents must be organised by collection based on these themes. Browsing of materials by collection or subject.</td>
</tr>
<tr>
<td>“The History Panel lacks any formal inventories for the students project. The reports are uncatalogued; not even at the collection level. It is highly unlikely that inventoried efforts would be undertaken.”</td>
<td>An organisation feature is necessary in the form of a cataloging module. A user-friendly template is needed where documents are inventoried and described. Description would be in the form of meta information creation, based perhaps on the Dublin Core metadata schema.</td>
</tr>
</tbody>
</table>
Table 6.2, continued

| “It seems to me that students access to the room on their own is impossible. The room is grill-locked most of the time. Only History subject teachers have access to the History Room. Soraya said that teachers use the room for History instruction if they need to use the resources that are “difficult” to be brought into the classrooms. Students from all secondary levels (1-5) are brought to the room once in a while mainly to look at students projects. History Society uses the room for co-curricular activities.” | Serve all potential users on the Internet. Serve a wide variety of information needs for example students conducting school project; teachers planning for curriculum instruction and individuals who are interested in local history. |
| “Searching for a specific report has to be done manually. It seems difficult to search and locate students work based on title, subject or author. I specifically asked for any project written on Tun Abdul Razak by the 2000 batch, and Soraya had difficulties finding one.” | The system should be capable of handling field-specific searches (such as author, subject and keyword) and full-text search. Specification of limits of search within a subject or across a collection. |

6.2.2 Observations from the PRS (Self-Access Learning Centre) Room Visits

In an effort to determine the location of access and place where the students and teachers use the digital library, the researcher visited the PRS room, which the ICT coordinator described as “a favourite place among students during school recess”. The self-access learning centre is accessible to students anytime during school hours, with or without teachers’ supervision. Resources accessible to both teachers and students in the PRS room include learning and teaching modules, exemplary students projects, interactive computer learning packages for various subjects and the Internet. The resources are systematically arranged by subject and resource type. The researcher visited the room on several occasions either to meet with the ICT coordinator, or to conduct interviews with the teachers. It was observed that during most of these visits, there were groups of students in the room referring to learning modules or students projects, conducting discussion, preparing teaching aids or accessing the Internet from any of the 10 computers there. There were also about three or four PRS prefects on duty for both morning and afternoon school session and
their responsibilities are among others to “make sure that the room and the resources are properly used and are in good condition” (*pastikan bilik ini dan bahan-bahannya digunakan dengan baik, dan sentiasa dalam keadaan yang baik*) (ICT coordinator)

The observation made from the visits justifies the school readiness to use digital libraries as it has the infrastructure and the supporting environment in terms of ICT-mediated learning. The observation concludes that the PRS room is an ideal location in the school where students, especially those who do not have Internet at home, can access other students projects and web resources, as well as use the digital library to create and submit their school projects. The visits to the two locations were considered to be an informative component of assessing the need for a collaborative digital library that students can use to conduct their History projects and help to populate the Location (Where) component of Zachman Framework used (*see 7.8*).

### 6.3 Processes and Procedures Related To Content of the History Project

The researcher develops a procedure for analysing the content for the collaborative digital library records of student’ project, through an examination and assessment of 30 samples of students work. The intent of this research activity was twofold:

(a) To identify the functional requirements for the report generation tool of the collaborative digital library

(b) To identify the accepted display and browsing format of the project reports in the collaborative digital library.
The researcher also completes a review of official documents by the Ministry of Education and the school regarding the History project such as evaluation instruments, and documents on procedures and processes of the school-based project in order to provide an understanding of the current environment that is the context for the collaborative digital library implementation. This research activity is central to clarify and understand the policy context that affects design, management, implementation and use of the collaborative digital library.

6.3.1 Document Analysis of Students Project Work

In analyzing the students’ reports, the researcher (a) determines how students organise the information they obtained and present it in a form of a school project report; and (b) identifies the resources students use when creating their school project and how they present the resources within the text or in their writings. The contents are closely examined to identify the following criteria in assessing students project report:

(a) the presentation style

(b) the types and format of resources used

(c) the citing of resources in text and their presentation in the reference list

The 30 projects were about the following prominent personality, with the number of students choosing the person in parentheses:

(a) Tunku Abdul Rahman Putra Al-Haj, Malaysian First Prime Minister (8)

(b) Tun Abdul Razak Hussein, Malaysian Second Prime Minister (3)

(c) Tun Mahathir Mohammad, Malaysian Fourth Prime Minister (7)

(d) Abdullah Ahmad Badawi, Malaysian present Prime Minister (2)

(e) Onn Jaafar, Dato’ (3)
In general, across writing ability levels, students displayed some command of content knowledge about their research topic. Both the general literacy skills and content of the reports varied greatly. Sorting decisions were based on the following criteria:

(a) The overall maturity and appearance of the report – the content of the writing passages (accuracy of statements, importance or relevance of information) and neatness of handwriting

(b) Length of the report

(c) Sentence structure or syntax – sentences and wording followed standard Malay Language grammatical structure and convention

(d) Spelling and vocabulary – correct spelling, appropriate usage of difficult or unfamiliar words.

All 30 reports received an A as the grade. The 20 reports produced in 2004 were handwritten, and the ten 2005 reports were all word-processed. Soraya, the History Panel Head informed that most of the reports produced in 2005 were word-processed and a check on the school implementation guideline indicated that students may either hand-written or use computer to produce their report (“gunakan kaedah tulisan tangan atau komputer oleh calon itu sendiri” - Guidelines on the Implementation and Evaluation of the PMR History Coursework 2005). Out of the 30 samples, the researcher ranked and coded 8 samples as
exhibiting high writing ability, and 22 were coded as displaying medium or average writing ability according to the four criteria listed above. Reports produced by students whose writing ability was ranked average tended to include general content pertaining to the personality, which is commonly found in biographies such as personal particulars and background information, achievements and contributions to the society or country. “Average” students were more likely than “high” students to include details about their subject that were not central to why they thought the personality was important in history. Students whose writing was coded as “high” tended to write fairly comprehensive responses displaying content knowledge that was relevant and interesting. Their overall writing ability generally offered comprehensive and elaborate responses, full of relevant and interesting textual and pictorial information. Their report typically comprised at least two paragraphs under a heading or sub-heading and integrated with illustrations. Writing was cohesive, with students commonly addressing each individual facet of the question systematically. Students in this category easily identified the defining accomplishment of the personality they had studied, and supporting this fact with other relevant details. They tended to include a short story or a synopsis of the person’s life and career. Their narratives came closer to “telling a story” than did students in the other group (who seemed to copy and paste biographical information), and this makes their writing looks original.

Almost all students were able to provide at least one information source they would use, and most students provided more than one resource. Several students created comprehensive lists of information sources, including as many as seven or eight diverse information resources. A total of 27 reports listed the web resources as references, which connect to the survey findings and students interview that students highly use Internet resources in their school projects and assignments. The most frequently referred print
source was biographies. Students also used textbooks, encyclopaedias, magazines and newspapers. A few students used the following primary resources in their project: autobiographies, interviews, letters and speeches. Only two reports listed television programmes and video as resources used.

Based on the document analysis, it appears that the students are capable of conducting independent research and demonstrate their ability to achieve the objectives to “search and collect historical facts from various resources” and “classify, analyse, evaluate and summarize information based on the given format” (Guidelines on the Implementation and Evaluation of the PMR History Coursework 2005). However, the students in general had failed to demonstrate their ability and understanding in the following aspects of recording historical facts as indicated in the guidelines and are translated below:

(a) write caption or description below an illustration in the document (tulis kapsen atau penerangan di bawah gambar di dokumen)

(b) write caption or description below an illustration, map or document in appendices (tulis kapsen atau penerangan di bawah gambar, peta atau dokumen di lampiran)

(c) write references in the correct format (rujukan ditulis dengan format yang betul)

The results of the document analysis of students project have a variety of implications for the design of the content creation or report generation tool in the digital library, and the display format of the reports as indicated in Table 6.3. The design implications populate the design standards at both the owner and the designer’s view of the Function (How) expressed as conceptual models (see 7.7.2) and programme modules (see 7.7.3), and the Data (What) cells expressed as data and metadata table descriptions (see 7.5.3) of the Zachman Framework used.
### Table 6.3
**Samples from Document Analysis and Corresponding Design Implications**

<table>
<thead>
<tr>
<th>THEMES</th>
<th>EXTRACT FROM DOCUMENT ANALYSIS NOTES</th>
<th>DESIGN IMPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The reports vary by topic.</td>
<td>The reports have various topics, ranging from Malaysian leaders, academicians, entertainer, social activists and local historical figures. 2004 students also include information on historical events associated with a personality for example Tunku and Merdeka Stadium and Sultan Abdul Samad Building. One student wrote about Mahathir and compared him with the previous Prime Ministers.</td>
<td>The need for relation metadata to associate related relevant sources.</td>
</tr>
<tr>
<td>Students follow specific format to organise the contents however the headings and subheading used for portions of the reports differ from one to another</td>
<td>Hand-written. 47 pages. Has the following on its cover: Title, Name, School, Class and Teacher’s Name written on gray paper pasted on the report cover Has the following content headings in order in a form of content page: Acknowledgement, Research objectives, Research method, Historical Event under study, Historical Figure under study, Summary and References. Hand-written. Thick, about 130++ pages, including appendices. Has the following on its light blue cover: Title, Name, Index No, School, Class, Submission date, These information are written on strips of papers, pasted on the report cover. Has the following content headings in order in a form of content page: Acknowledgement, Introduction, Objectives, Method, The Report, Summary, Appendix and Bibliography. All 2005 reports have the following information on the cover page: Title, IC No, Exam Centre, Index No, School, Teacher’s name, Score.</td>
<td>A registration module is necessary. Students input personal details such as name, school name, IC etc. The need for a template to generate cover for the report. Students only need to input information such as title and teacher’s name. Report Elements or administrative metadata needed Methods to organise the report around personal context rather than a prescriptive context. Students can define and add headings and subheadings such as Acknowledgement, Introduction, Objectives, Method etc. Awareness of the potentially huge files to transfer and display Display and browsing of report in the form of content page</td>
</tr>
</tbody>
</table>
Table 6.3, continued

<p>| Students are creative in their presentation style and focus on the aesthetic value (or presentation style) of the report | The contents for each heading are presented in bullets form. Student uses coloured papers for each heading, e.g., research objectives written on pink, method on yellow, summary on orange etc. The contents are written on white papers, and placed (pasted) under subheadings. The subheadings are written on blue coloured papers, cut according (in wavy shape, like sea) to size of content and pasted on A4 paper. Student uses metallic gold and silver for the subheadings. The contents follow, hand written in black ink. Student uses coloured papers for each page. The headings are handwritten in large font size using multiple colours. Student uses colour pencil for this. The contents are written in blue ball point pen. Student draw small designs of flowers at the end of each page. Maps are drawn. | The need for a text editor that support organisation of heading and subheading, and various formatting features such as font size, type and colour, bullets and numbering, The need for a template to generate various backgrounds for the report. |
| Students use a variety of sources but do not cite them correctly | Students write the source that has helped her to write on “Shah Alam Blue Mosque” as Permodalan Negeri Selangor Berhad. The contents are not cited within the text. Student indicates that she conducts an interview to gather the information, but does not indicate which information in the report she obtains through the interview session. | The need for a reference template or citation generator to assist students to adhere to the correct citation style, record the digital sources used and the locations of those sources to properly cite and credit those sources. This tool gives guidelines for accurately citing both print and Internet resources. |
| Students have illustrations and pictures but do not describe them, or integrate the figures in the text. | Pictures, most of them photostated (black &amp; white) are placed within the content. Not clear, too dark. One coloured picture of the masjid. [taken perhaps from a magazine]. Students have a lot of pictures for the project. One student scanned from books, colour printed and pasted within the text. Although she does not number the pictures, she has all described clearly. Some are integrated within the text. 2005 reports have a lot of pictures taken from the Internet. Although described as captions, students do not indicate from where they obtain the images from. | The need for: • a template to describe captions of images to be integrated within text. The descriptions can be searched and captured during query sessions. • an upload image feature • links within text to resources used in the report or those outside the digital library system |
| Students also conduct interviews and tape the interview sessions | One student indicated in her report that she interviewed a local personality and audio-taped the interview sessions. | The need for: • an upload audio feature • an upload video file feature to allow future students to share their video resources |</p>
<table>
<thead>
<tr>
<th>Appendices include copies of resources used as specified by the guideline.</th>
<th>Materials for appendices are all phostated images of the masjid (not clear) taken from books and magazines. There are also two newspaper cuttings, but texts are not clear. Student writes the description for some images (under the images). Some are left undescribed, with ? mark annotated by the teacher. Student use coloured ink pen for this.</th>
<th>The need to automatically link web resources used in the report, either in text or in the reference list.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Materials for appendices are all phostated articles taken from newspaper articles of the personality’s collection, dated back as far as 1970 from <em>Utusan Melayu, Utusan Pelajar, Utusan Zaman</em> and others. All articles are however without accompanied description, and not cited in the text. All are very clearly Xeroxed. There are also certificates of the personality</td>
<td>The need for a template to generate appendices.</td>
</tr>
<tr>
<td></td>
<td>Some report includes printout of websites used as references as appendices. This makes the reports thick, exceeding the 15-20 pages required.</td>
<td></td>
</tr>
<tr>
<td>Teachers make comments / give feedback on the report.</td>
<td>A few reports included inaccurate information. One wildly inaccurate information described was the number of “Merdeka” calls by Tunku on 31 August 1957. One student wrote 3 times, 2 students wrote 10 times. Teacher underlined the incorrect statement. Teachers include comments such as “Good” remarks and tick (✓) signs on good reports.</td>
<td>The need for an annotation tool where incorrect information is highlighted so as not to perpetuate the use of incorrect information in future reports.</td>
</tr>
<tr>
<td>Teachers give grades and apportion grades on report grading sheet</td>
<td>All reports have a grading sheet (on the report cover). Teachers provide marks for each evaluation component, total the marks and provide a grade for the project.</td>
<td>The need to include report grading feature for teachers. Marks are automatically calculated and grades are given.</td>
</tr>
</tbody>
</table>

### 6.3.2 Document Analysis of Official Documents

Analysis of official document provides information on procedures and processes of handling the History Coursework at the school level. Specific documents analysed are:


(c) Student Evaluation Form for PMR History Coursework (*Borang Markah Individu Penilaian Kerja Kursus Sejarah PMR*) – not dated

(d) Evaluation Form for Form 2 History Coursework (*Borang Pemarkahan Kerja Kursus Sejarah Tingkatan Dua*) – not dated

(e) Revision of Local History Study Course Content for Form 2 by Selangor State Education Department (*Kandungan Kursus Semakan Kajian Sejarah Tempatan Tingkatan Dua oleh Jabatan Pendidikan Negeri Selangor*)

The documents provide the following information, as well as confirm this information provided by the teachers interviewed in this study:

(a) goals and objectives of the History Coursework;

(b) the school’s procedures in handling the History Coursework;

(c) the chronology of events that take place in the implementation of History Coursework;

(d) guidelines for students to conduct research, write and produce the project report;

(e) areas of research or topics to be studied;

(f) types of resources to use and guidelines on how to present the resources in the project report;

(g) evaluation components and procedures in the History Coursework.
6.4 Summary of Chapter Six

This chapter has presented the findings from teachers interview, site-visits and observation, and document analysis of student reports and other official documents. Teachers interview provides information on the specific processes and procedures, as well as the chronology of events that take place in the implementation of the History Coursework at the school level. Analysis of official documents from the Ministry of Education and the school itself confirm the information provided by the teachers. Teachers confess not collaborating with one another in handling the students project however they are appreciative of the opportunities to work together and learn what teachers and students in other classes are doing. The observation made from the History Room visits justifies the need for a digital library of students’ projects to provide easy and better access to the school’s collection of 1800 history project reports. Information from site-visits and observation of the PRS room justifies that the school is ready to use digital libraries as the infrastructure and the environment for an ICT-mediated learning are already in place. Document analysis of students’ reports provides design implication of the report generation tool and display format of the reports in the digital library. The information obtained from these qualitative fact-finding techniques helps the development of user requirement expressed in terms of Content (What), Location (Where) Time (When), and formulate further design implication in the Function (How) cells in the Zachman Framework.

The next chapter presents the requirement matrix in the digital library framework, namely resources, processes and services, locations, stakeholders, events and major goals, that populate the cells in Row 1, 2 and 3 of the Zachman Approach used.