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Information Audit at an Indonesian Public University

Yosefina Dhae, Kathleen Smeaton
Community, Science and Engineering Center, Gardens Point, Brisbane, Australia
yosefina.dhae@gmail.com, k.smeaton@qut.edu.au

Abstract: This research presents the results of an Information audit (IA) at the Planning department of an Indonesian public University. An information audit (IA) was undertaken to determine (1) the existing information resources available to the Planning department staff; (2) how information flows both internally and externally; (3) potential information problems in the Planning department. Case study methodology was used in this study with document analysis, questionnaires, and interviews as data collection tools. The participants were five staff of Planning department. Data was analysed manually to create a list of information resources and map information flows. Thematic analysis was then used to analyse interview data to find general information management themes in the Planning department. The research found that people, timeliness and technology were information problems faced by planning staff. Based on the data from this study a recommendation is that the University improves infrastructure, and conducts an IA across the entire University with the aim of creating an organisational information policy. This will allow the University to create better information management practices and assist the University achieve its strategic goals.

Keywords: *Information Audit; Information flow; Information Resources; Case study; Public university*

1. Introduction

Information is recognised as a valuable organisational asset (Henzcel, 2001; Orna, 1999). It is used by organisations to share knowledge and aid with decision making (Middleton, 2002) leading to improved business outcomes (Orna, 1999). Choo (2002) argues that the quality and value of information is a significant factor in the success of organisations. Therefore, successful information management (IM) is critical to organisational success. According to Detlor (2010, p.103), information management is "the management of the processes and systems that create, acquire, organise, store, distribute, and use information". IM helps organisations to access, process and use information efficiently and effectively. It helps employees in organisations accomplish their tasks because they are better informed. In order to investigate IM practices within an organisation, an information audit can be undertaken to evaluate the current IM practices (Henzcel, 2001).

An information audit (IA) is a systematic evaluation of information use, information resources, and information flow within an organisation (Henzcel, 2001). An IA allows organisations to analyse how their information flows contribute to, or hamper the organisation in reaching strategic goals. Many organisations have undertaken an IA in order to capitalise on business intelligence (Langley, Seabrooks, & Ryder, 2003; Vo-Tran, 2011), including government agencies (Dubois, 1995; Lamoral, 2001; Henzcel, 2001; Mnjama, 2004; Canada Border Services Agency, 2011; Jones, Mutch, & Valero-Silva, 2013), hospitals (Henzcel, 2001), and universities (Dhillon, 2001). These organisations have used the IA has to improve their information management practices. While organisations have undertaken IA's the literature reviewed is from the United Kingdom, Australia, USA, Canada, and South Africa. To do there are no published studies from Indonesia, specifically in the context of an Indonesian university. Therefore, this study aims to address the gap in the literature namely, information audit in the context of an Indonesian University. This research investigates the IM practices of an Indonesian public University (University Y) via an IA. Although University Y realises that information management is critical to running a successful organisation, it has never conducted an information audit. In order to fill the gap in the literature, this research as well as aims to assist University Y with its overall IM practices. As this reserach was an exploratory pilot study the Planning department at University Y was the focus for the IA. The Planning department has three main tasks:

- Managing the University's activities and budget planning to collate the information needed to present to the Ministry of Research, Technology, and Higher education and Ministry of Finance in order for the University budget to be determined.

- To ensure that all activities and budget planning are based on the University's strategic plan ensuring strategic goals of the University can be achieved.
- Collecting and managing data and information in the University to provide better information services.

2. Literature Review

Information audit-The definition of Information Audit (IA): There is no universally single accepted definition of an IA. Based on the existing literature this study defines IA as a way to examine the information use, information resources, information flow, and information needs of organisations in order to, improve organisations' services, information management and assist the organisation to achieve its strategic goals (St.Clair, 1995; Buchanan & Gibb, 1998; Orna, 1999).

Information resources: There are three different approaches for defining information resources. Burk & Horton (1988, p.14) define information resources as "a source of supply, support or aid, especially one held in reserve". They classify information resources into three different categories as sources, services, or systems. The second approach in defining information resources is provided by Orna (1999). She defines information resources as a 'thing' that people in organisations hold in order to use in their work and to achieve the organisation's objectives.

The third approach is from Buchanan & Gibb (2007). They argue that organisations must provide the value of information resources in order to assist organisations to identify which are the key information resources and which are information resources have no value.
The values of information resources are from 1 to 5 with the description of each value as below:
" 5: Critical to the task,
4: provides significant benefits or adds value to the task
3: Contributes directly to the task but not essential
2: Provides indirect or minor support to the task
1: Not used or has no perceived benefits for the task"
(Buchanan & Gibb, 2007, p. 170).
This study used the approach of Burk & Horton (1988) to define information resources and Buchanan & Gibb (2007) to give value to each resource.

Information Flow: Information is needed by every employee within organisations to interact, exchange knowledge, perform daily duties and aid in decision-making. Therefore assessing how it flows through the organisation is crucial (Durugbo et al., 2013). Information flow also reflects the cooperation within organisation (Westrum, 2014). In identifying how information flows, it is important to remember that information has the potential to bottleneck. This is due to two main factors; firstly, lack of information technology (IT) support and secondly, the way people share information (Orna, 1999; Thornton, 2001).

3. Methodology

This research uses a case study methodology, which aimed to uncover (1) the existing information resources available to the Planning department staff; (2) how information flows both internally and externally; (3) potential information problems in the Planning department. The data collection was conducted in May – June 2016 using three methods: document analysis, questionnaires, and interview. The first part of the data collection involved document analysis and documents such as the organisational structure were analysed to determine the culture of the University and how information may flow within the University. Job descriptions were utilised to generate tasks of each employee and record the information resources, which may support the tasks. A questionnaire was then designed to investigate the information resources and information flow within the Planning department. The questionnaire had seven questions which included Likert scale answers (scale 1 to 5), and multiple-choice questions. The questionnaire was sent to participants' via email. Finally, interviews were conducted to seek participants' persective of information gaps within the Planning department. For this study, telephone interviews were conducted using an application named 'Line' and the interviews were recorded by the lead author using MP3 recorder.

The responses related to information resources and information flow were then analysed manually to provide an inventory as well as recording the information resources that the Planning department staff both make available to internal and external staff and access internally and externally to carry out daily tasks. Interview data was transcribed then analysed manually using thematic analysis, to find the general themes in the data related to information gaps. The participants were all staff in the Planning department at University Y. They were invited via email to participate in this research. Out of eight staff, five staff volunteered to be a part of the study by filling the questionnaire and joined the interview. To ensure participant anonymity participants are referred to as P1, P2, P3, P4 and P5. Table 1 shows the participants' tasks.

Table 1: the participants' tasks

Participants	Tasks
P1	Task 01: Create a book of 'University in Number' Task 02: Create the senate members' profile Task 03: Create the Professors' profile
P2 & P3	Task 04: Collect, manage and analyse budget and activities planning documents of each unit in university
P4	Task 05: Create the university's profile and university's leaflet
P5	Task 06: Create the university's revenue target and the budget and activities planning

4. Results

The findings for each research question are explained in detail below.

Research question 1: ***What are the existing information resources available to the Planning staff to accomplish their tasks?***

The findings of the study revealed that the information resources, which are needed by the Planning staff to accomplish their tasks (based on the content of the resources), were documents, reports, and decrees. Documents comprised of documents of: Lecturer, Administration staff, Students, Alumni, Scholarship recipients, Goods/services procurement planning, and University's Cooperation (MoU) also , The proposed activities and budget planning, the university's Strategic Plan. Reports included report of Self-Cost fee, New students admission, Financial report, Research and Community services report. Decrees consist of Decree of Rector of new student's admission, Decree of Minister of Research, Technology, and Higher Education of single tuition fee.

Table 2: Information resources for task 01

No of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 01	Create a book of 'University in Number'	Lecturers documents	Employee department	5	-	-
		Administration staff documents	Employee department	5		
		Student documents	Academic department	5		

	Community services report	Community Development Institution	5
	Research report	Research Institution	5
	Financial report	Finance department	5

In regards to the sources of information resources, the employees obtained information from internal University faculties, institutions and departments and a wide variety of people working in these areas from very senior staff such as Heads of Bureaus and Professors to administration staff. External to the University, information resources were obtained from Ministry of Research, Technology, and Higher Education and Ministry of Finance. The staff also access information resources from the internet especially from certain website such as Bhineka.com to find out information of price lists and brochures for procurement of capital expenditures. In regards the value of each information resources, the value of resources was mainly assigned a '5', which means the information resources are critical to the task. Details of information resources within the Planning department based on tasks can be seen in table 2 – table 7 below.

Table 3: Information resources for task 02

Number of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 02	Create the senate members' profile	Senate members documents	Senate members, Employee department, Academic department, Research institution, Community Development institution	5	-	-

Table 4: Information resources for task 03

Number of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 03	Create the Professors' profile	Professors' documents	Professors, Employee department, Academic department, Research institution, Community Development institution	5	-	-

Table 5: Information resources for task 04

Number of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 04	Collect, manage and analyse budget and activities planning documents of each unit in university	The proposed letter	Faculties, units, institutions, Postgraduate, Bureaus	5	-	-
		Terms of Reference documents	Faculties, units, institutions, Postgraduate, Bureaus	5		
		Budget details documents	Faculties, units, institutions, Postgraduate, Bureaus	5		
		Absolute responsibility statement	Faculties, units, institutions, Postgraduate, Bureaus	5		
		Supporting documents (such as Brochures for capital expenditures)	Faculties, units, institutions, Postgraduate, departments	5		
		General cost standard documents	Ministry of Finance, Internet (Ministry's website)	5		
		Owner's estimate price documents	Commitment Officer	5		
		University's strategic plans document	Planning department	5		
		Summary of university's budget and activities planning documents	Planning department	5		
		Total budget of *PNBP*	Ministry of Research, Technology, and Higher Education, Planning department	5		
		Total budget of *BOPTN*	Ministry of Research, Technology, and Higher Education,	5		

			Planning department			
		Price lists for capital expenditure	Internet (Bhineka website, Ministries Websites)	5		

Table 6: Information resources for task 05

Number of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 05	Create the university's profile and university's leaflet	Students document	Academic department	5		
		Alumni documents	Academic department	5		
		Students scholarship recipients documents	Student affairs department	5		
		Lecturers document	Employee department	5		
		Administration staff document	Employee department	5		
		Goods/services procurement planning document	Procurement service unit	5	General plan of university's procurement documents	5
		The existing goods/services procurement documents	Procurement service unit	5		
		University's cooperation documents (MoU)	Academics department, Vice Rector of Cooperation	5		
		Community services report	Community Development Institution	5		
		Research report	Research Institution	5		
		Financial report	Finance department	5		
		Infrastructures and facilities documents	Legal affairs, Procedures, and Facilities department	5		
		Accreditation (faculties and university) documents	Academic department	5		
		Performance quality documents	Faculties, Quality Assurance Institution	5		

Table 7: Information resources for task 06

Number of tasks	Tasks	Information Resources (IR)	Sources	The value of importance of IR	The ideal of 'IR' which is not provided	The value of importance of IR
Task 06	Create the university's revenue target and the budget and activities planning	Students documents	Academic department	5	-	-
		New students admissions report	Academic department	5		
		Decree of Rector of new students admission	Academic department	5		
		Self-cost fee report	Academic department	5		
		Decree of Minister of Research, Technology and Higher Education of Single tuition fee	Ministry of Research, Technology and Higher Education; Internet	5		
		The university's cooperation document (MoU)	Academic department; Legal affairs, Procedures, and Facilities department	3		
		Projection of university's revenue documents	Minutes of internal meeting (Head of Bureaus and Head of Planning department)	5		

Research question 2:
How does information flow in the Planning department both internally and externally?

The source of information resources in the Table 2 to Table 7 above was used to map information flow in the Planning department by creating the information flow diagram. Visually, the diagram presents information in-flow, which information flows from internal and external university to the Planning department, and out-flow which information flows from the Planning department to internal and external university. Internally, information flows vertically and horizontally according to the organisational structure of the university. For in-flow, information flows from Faculties, Units, Bureaus, Institutions, and Departments in the University. The information also flows from individuals to the Planning department. For out-flow, information flows from the Planning department to Faculties, Units, Bureaus, Institutions, and Departments, and to individuals (the University's management: Rector, Vice rectors, and Head of Bureaus). Externally, for in-flow, information flows from the Ministry of Research, Technology, and Higher Education, and Ministry of Finance. For out-flow, the Planning department share information with the Ministry of Research, Technology, and Higher Education, the Ministry of Finance, the Regional Office of Directorate General of Treasury, The Evaluation and Monitoring Team of State Budget and Local Government Budget (*TEPRA*), and the Bureau of Statistics. Figure 1 – Figure 4 show the information flow at the Planning department internally and externally.

Figure 1: Information flow internally (in-flow)

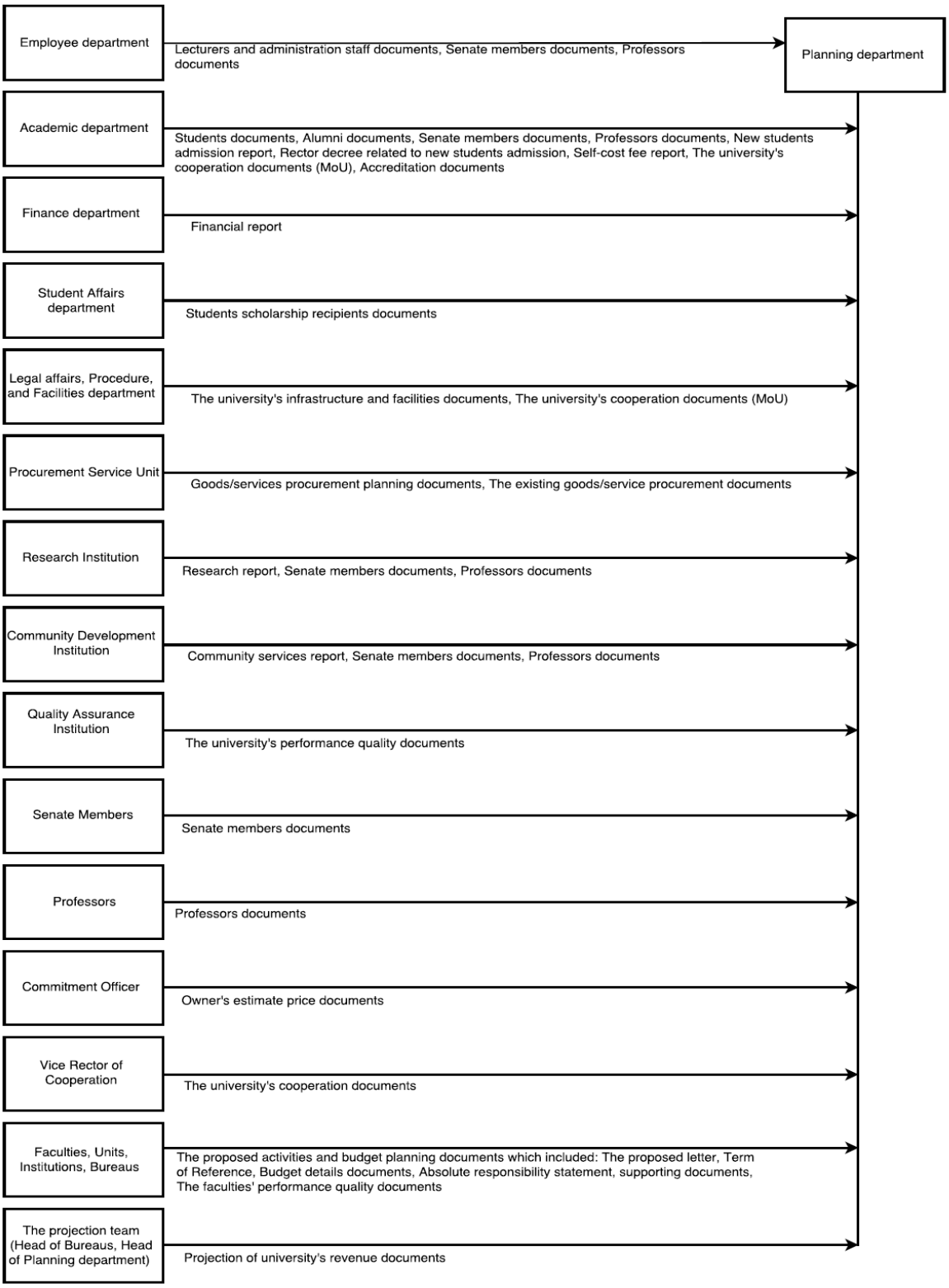


Figure 2: Information flow internally (out-flow)

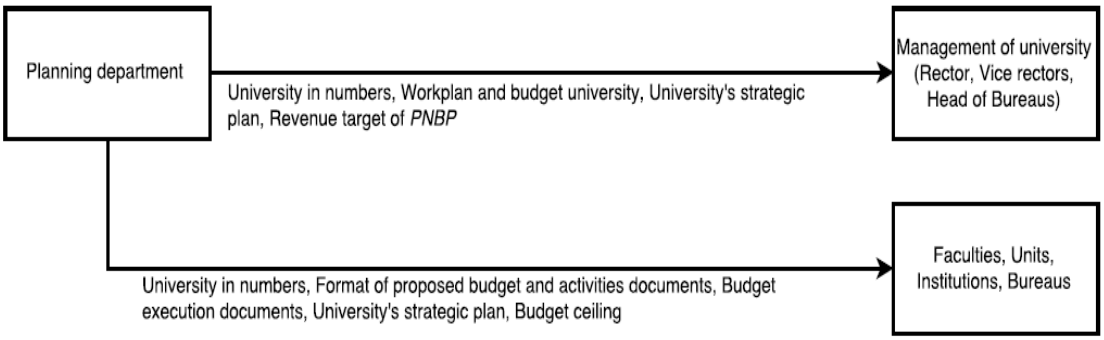


Figure 3: Information flow externally (in-flow)

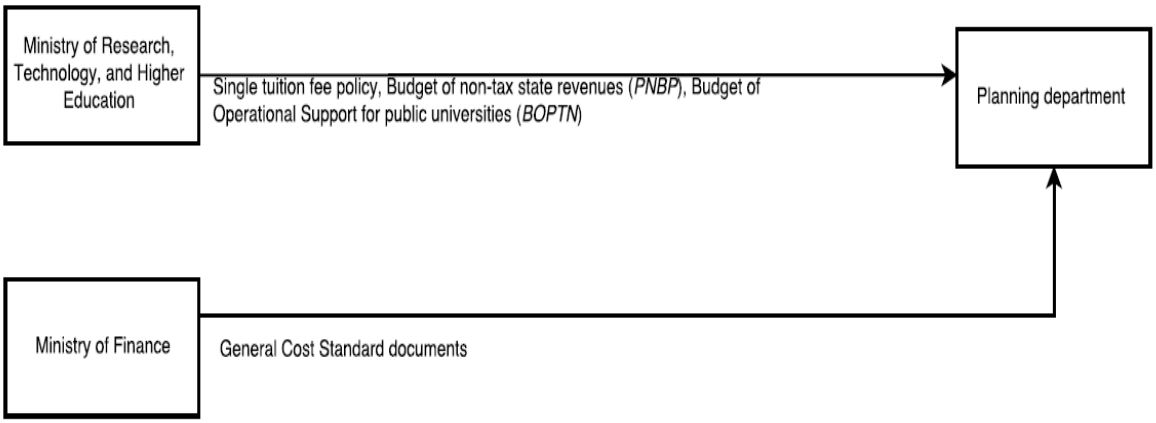
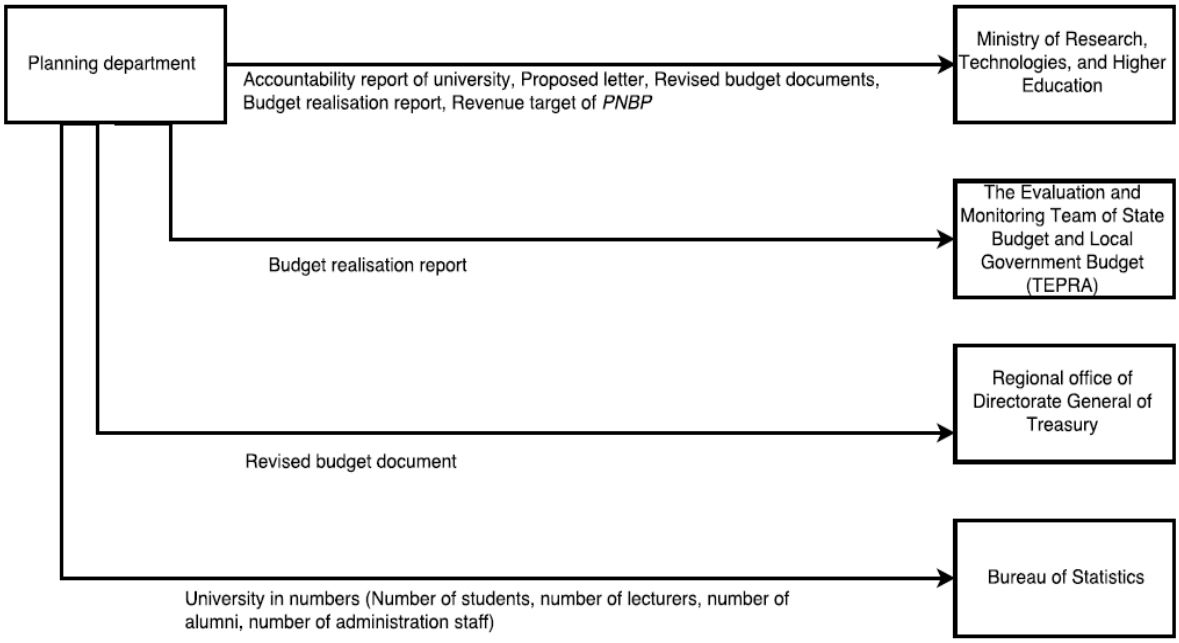


Figure 4: Information flow externally (out-flow)



Research question 3:
What are the information gaps or problems in the Planning department?
Three main themes were identified as a result of data analysis: people; timeliness; technology.
Theme 1: People
This theme is divided into two sub themes which relate to the people. Firstly, the ownership of information and secondly the responsibility to create and use information.
Sub theme 1: the ownership of information
The study found that one of the information problems faced by Planning staff is a difficulty in accessing information due to the information being owned by certain people or a single person.
P1:
"When we go to the units, the staff is not there, or the people we are going to meet is not there..... when we request data they said that the information we needed is kept by Mr.B. And we go there he is not there or he is not coming to office".
P4:
"It is a human resource problem. When we go there and the people who hold the information is there then we can get the information. Otherwise, we cannot get the information. It is inappropriate, if institutions' information is owned and mastered only by one person".
P5:
"I request all data at Mr. X because he keep all data completely".

Sub theme 2: the responsibility to create and use information
The participants emphasised the stewardship of the information and behaviour when receiving and using information.
The quotations that relate to this sub theme are:
P2:
"There is asynchronous information from planning department and them (units). Sometimes they create documents according to their desire".
P3:
"*All units has been told to use similar information but there are one or two units who are neglect the information. ... yes, the information is verbally not written".*
P4:
"I've asked procurement services unit, they said the information I needed is created by planning department. But, when I asked planning department, they said that procurement services unit is the unit who have a responsibility to create the information".

Theme 2: Timeliness
In this theme, participants described how the information they access is not up-to-date or timely. This theme also revealed that units or certain people need more time to finalise their documents before sharing it with the planning department.
P1:
Sometimes units (internal and external) request information from planning department. However, because planning department not yet has the information from units in internal university, consequently, planning department need more time to request and/or sharing information.

P3:
"Timely and accuracy of information".
P4:
"The difficulty is an updated information".

Theme 3: Technology
The third theme arising from participants was technology which included power failure, which affects completion of tasks and causes information bottlenecks.
P1:
"Sometimes when we go there (units), one of their reasons is power-failure".
P3:

"Their reason is internet down".
P5:
"The problem is when we would like to send a file through email, the internet down".

Discussion: According to Orna (1999), information resources are essential sources that people need in organisations to do their jobs. This study found that the Planning staff need a variety of information resources to accomplish their tasks. To determine the importance of information resources Planning staff gave 'a value' to each of the information resources (Buchanan & Gibb, 2007). This study found that in the Planning department, all information resources except one were critical to the tasks (value=5). It is essential that staff not only have access to these sources, but also value the information within them. This knowledge of the value of information allows Planning staff can treat the information resources accordingly, to both complete their tasks, and affect upon the University's strategic goals. In terms of sources, Planning staff access information resources from a variety of sources internally and externally. Burk & Horton (1988) define sources as "a place, store, or person from which information can be obtained" (p.47). In this study, information resources are found in faculties, units, departments, bureaus from which Planning staff access the required information. They also access information from people such as Vice rectors, Commitment Officer, Senate members, and Professors. Additionally, Planning staff acquire information from documents and internet. As proposed by Middleton (2002), that documents, database and internet are categorised as the information sources.

In regards to information flow, the Planning department not only receive information but they also share or spread information. The diagrams show that information can flow from individuals, departments (internal), or organisations (external) (Henzcel, 2001). The information mostly flows in the form of written information (Yazici, 2002). From Figure 2 and 4, it can be seen that 'who sends, what information' to the Planning department or from the Planning department to its internal and external environment, in Figure 3 and 5. The diagrams also found that there were some issues. Firstly, there was a duplication of the information flow. This is a condition where different people receive similar information from different sources which can lead to mismatching and inconsistencies of information (Henzcel, 2001). Secondly, there was a gap in information provision (Henzcel, 2001). This is where the information required is not provided. As can be seen in Table 7, in task 05 'Create the university's profile and university's leaflet', there is one important information resources that is needed, but has not yet been provided. Both of these issues can affect the University on a daily operational level, and on a long-term strategic level.

This study found that people, technology and timeliness are the information problems faced by the Planning staff. These problems are also the causes of information bottlenecks. People are a critical factor in information flow as they create the information culture. Information flow is a series of interactions between individuals with individuals and individuals with groups of people. Therefore, people in organisations need to cooperate in sharing information to ensure the smooth flow of information (Westrum, 2014). This study found that people tend to keep information individually (the ownership of information). Only a single person authorises the information, which leads to obstructions in obtaining information. Whereas, corporate data or information must be owned by the organisations, not by any single person, section or department (Hanson, 2011). Staff within the University require training around sharing of information, and also access to infrastructure to support this, such as shared network folders.

Related to people, this study also found that there is lack of responsibility in creating and/or using information. There is no clear working domain on 'which unit create what information', and as a result, important information is not created or stored. This can lead to the use of irrelevant resources in completing their tasks (Henzcel, 2001). This result may be seen as incongruous with the first result, with people taking too much ownership of information they wish to control. However, what the results show is that individuals are creating and keeping what they believe is important information, rather than focusing on the information needs of the organisation. Again, training and information infrastructure would allow staff to collect, and share pertinent information. The second problem is timeliness. Staff could not get timely updated information, which affects the flow of information and impacts on decision-making process and University performance. Westrum (2014) argues that information must be updated and timely otherwise, the organisation will have a make poor decisions due to low quality information. Once staff awareness of the

importance of information was raised this issue may be resolved, however it would also be wise for the University to create standard procedures for staff around information sharing, such as response times for requests.

Technology was the third problem faced by Planning staff. The technology here is related to the availability of electrical power and access to internet. The University acknowledges that electrical supply is one of main problems they face, an issue faced by Governments and organisations throughout developing countries. However, the University must consider providing appropriate technology to overcome the power supply problems. If the power failure means staff cannot access critical information resources such as the internet, this will affect their performance. Technology as a whole acts to enable information management; to manage the flow of information; and therefore increase the quality of decision-making (Webb, 2008; Detlor, 2010; Dewett & Jones, 2001; Westrum, 2014). The use of technology directly relates to the other categories. Without adequate technology to both find, store and share information, staff cannot complete tasks on time. This in turn affects the quality of decision-making and the performance of the University.

5. Conclusion and Recommendations

This study has investigated the information practice at Planning department at a public university in Indonesia through an Information Audit (IA). This study found that most of the information resources the Planning staff needed were documents, reports, and decree. Most of the information resources were value '5', which means they were critical to the task. In regards to information flow, the study found that there are information duplications, and information bottlenecks. Based on thematic analysis, people, timeliness and technology were three general themes of information problem faced by the Planning staff. Based on the findings and data analysis, the recommendations for the university are as follow:

- Create an information policy for the Planning department

  This study found that lack of information policy in the Planning department impacts negatively on staff. An information policy would provide guidance to staff regarding ways to manage information. The information policy should cover:
  - Information management practice. The staff must be able to create, acquire, organise, store, distribute and use information. They must also be aware of how to access information management resources in different areas and ways to circumvent information bottlenecks.
  - Information sharing practices so that staff are reminded that that information resources are the property of University not of individual or groups.
- Improve infrastructure

  The University must find a solution on how to address continuing incidences of power failure. All activities in the University are highly dependent on power supply and staff cannot complete tasks in a timely manner with continual power outages. .
- Conduct further information audits for the entire University.

  This study has provided preliminary findings of an IA within one department and it is hoped that from this an IA will be conducted for all parts of University, leading to the creation of an information policy for the University. By having an information strategies, all staff in the University can become more aware of the information they use and place more value on information. Through this knowledge, they can effectively use information in their daily tasks and assist the University in achieving its strategic goals.

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