Business process modelling using ARIS: process architecture

Dina Tbaishat
University of Jordan, Amman, Jordan

Abstract

Purpose – Academic libraries have witnessed huge changes due to internal and external factors. Recent evidence shows that there is a lack of interest in process analysis within academic libraries. There is a lot written on the need to change academic libraries but there is little analytical research that investigates processes, in terms of the process architecture. The paper aims to discuss this issue.
Design/methodology/approach – The modelling tool used is Architecture of Integrated Information Systems (ARIS).
Findings – ARIS can provide a process architecture and design for academic libraries that might raise questions later about procedures and some inefficiencies.
Research limitations/implications – Library managers might need to learn new techniques.
Originality/value – There is a lot written on the need to change academic libraries but there is little analytical research that investigates processes, in terms of the process architecture. This research examines business process modelling for academic libraries, focusing on the process architecture, as a way of visualizing, understanding and documenting processes.

Keywords Academic libraries, Process architecture, Library management, ARIS,
Business process modelling, Library processes

Paper type Research paper

1. Introduction

The rise of technology has brought an information age that is heavily reliant on information and communication technology: "It is an age where the survival and development of humankind are ultimately defined by the use, production and consumption of information" (Ngulube, 2004). Academic libraries are important parts of this world, as organizations providing wealthy information resources.

During the past decades, the library environment and the nature of work within libraries have changed radically. A key theme is the management of change and embedding innovation in academic libraries and information services throughout this period of continuous change. In today's competitive world, change is an important aspect of any business lifespan, a business that does not continuously try to improve cannot expect to last long (Noran, 2000).

Business process modelling is essential in this era of rapid organizational change and competitive business environments. It is invaluable for both business and information technology audiences. Organizations aim to improve their processes through frequent adaptation of new business models that can serve and cope with emerging needs. The availability and capability of various information technology tools that are specifically created to design business processes and model organizational structures have made reaching the goal easier. The academic library is one example of an organization that is facing major challenges. During the past decades, the library environment and the nature of work within libraries have changed radically, therefore; innovative ways for managing change in academic libraries and information services is essential. Business organizations – including academic libraries – are being described in terms of processes rather than functional hierarchies. To be able to deal with change and improve libraries functions and processes, business process modelling can be used to examine libraries activities, and it can

also help improve processes as it involves redesigning organizations to remove unnecessary communication, processing and duplication of data (Bond, 1999). This paper introduces generic process architecture that embraces the main processes taking place in academic libraries. The tool explored and used for this research is Architecture of Integrated Information Systems (ARIS). The main research question is:

RQ1. How can business process modelling using ARIS visualize library processes?

2. Business process modelling in academic libraries

Processes are used to describe business organizations. Business processes refer to the workflow within an organization or a company, the processes and the transactions involved within the enterprise. "BPM is a set of technologies and standards for the design, execution, administration, and monitoring of business processes" (Havey, 2005). Organizations are using the business process modelling increasingly to document, redesign processes and develop their systems. Such models investigate interactions between actors working on a process (Leopold *et al.*, 2012). In other words, business process models help understand the organization's work, comprehend the process in detail and then use technological support for the improvements to human activities.

A lot of business process modelling methods are available in the literature, with different notations. Dijkman *et al.* (2012) state that new challenges and opportunities have emerged due to the large collections of business process models. As stated by Rosemann (2006), flowcharting of processes have been around for a while to represent a business process but terminology has changed; process modelling instead of mapping or flowcharting.

Simple flow charts are still used, such as the one used for representing the process of downloading an article (Cyburt *et al.*, 2010). Caetano *et al.* (2005) stated that the Object Management Group summarized the basics of process diagrams in its Unified Modelling Language (UML).

Ould (1995) developed the Systematic Technique for Role and Interaction Modelling method for the business process design in his book *Business Processes*, and this method predates his later development of Riva, which includes methods for designing the process architecture. The modelling method Riva presents Process Architecture Diagram (PAD) to view organizational processes, and Role Activity Diagram (RAD) to model individual processes.

ARIS is another modelling tool that can be used to view and improve library processes. It has been used in various organizations for modelling purposes; Tang and Hwang (2006) used ARIS to model electronic school campus processes. The modelling using this method resulted in shorter schedule of project implementation and reduced risk of failure. This indicates the importance of introducing dynamic models of processes to keep pace with the rapid changes in business environments. Vidovic and Vuksic (2003) developed a simple simulation model – using ARIS – for Croatian insurance company process in an attempt to evaluate the potential benefits and constraints of the dynamic business process modelling. In another work by Scheer and Nüttgens (2000), a general business process architecture using ARIS was presented, which is composed of four distinct levels: process engineering, process planning and control, workflow control and application systems. Rippl (2005) compared ARIS with Select Perspective (from Select Business Solutions), by describing the main differences between the two approaches, for instance, perspective is object oriented while ARIS is a structured methodology. The paper also suggested the areas in which either approach can be used, for example, the author states that ARIS is a more general framework that can be used for creating models of business processes in a wider area of business analysis.

For libraries, library managers have had concerns about finding new approaches to library operations a long time ago; for example, Rau (2007) discusses three examples from

1960s to 1970s that included use of Poisson modelling, queuing theory, Monte Carlo and other simulation techniques. As for investigating library processes, Atkinson (2003) used PEST analysis (which is a high level strategic analysis) to deal effectively with a change in strategic framework. PEST analysis helps illustrating the complex environment where academic libraries and information services reside and operate, by listing the political, economic, social and technological factors which affect the services provided.

As mentioned by the Procurement Executives' Association (n.d.), the Performance Measurement Action Team created by the PEA in 1993 chose the Balanced Scorecard model – created by Harvard Business Professors Kaplan and Norton (Balanced Scorecard Institute, 2011) – as a conceptual framework to translate the organization's vision into a set of performance indicators distributed among four perspectives: financial, customer, internal business processes and learning and growth.

The RAD (mentioned previously as part of the Riva method) was used occasionally in the literature to model a few library processes; Liu *et al.* (1999) used the RAD to model the process of checking out a book in the library. Tbaishat (2010) also used the RAD to examine academic library activities for periodicals. It was found that the business process modelling using RAD proved to be useful in visualizing the periodicals' acquisitions process in academic libraries and reveal further process improvements (such as finding out communication problems and removing unnecessary tasks). Khan *et al.* (2006) investigated the process of a scientific publishing process for digital libraries using RAD. Green *et al.* (2013) applied Riva to two higher education institutions, to create process architectures using the PAD. Urquhart and Tbaishat (2016) used the PAD (part of the Riva method) to model library processes in a PAD, viewing generic library processes and their relationships.

There is a lot written on the need to change academic libraries and much of it stresses the need for cultural change. Academic libraries have been embedding assessment into their plans and decision-making processes to satisfy users' needs (Smith*et al.*, 2015). However, there is little analytical research that investigates processes. Although some material may exist in internal reports (e.g. Stanford University's approach to business process redesign, Stanford University, 2005), and some discussions may be spotted in the conference literature (e.g. Webb and Galloway, 2000), however, there is not much discussion of academic library processes in the published literature. Stephen Town is one of the key people involved in the UK in this field, but much of his work was presented in a form of conference presentation as can be seen in LibQUAL (Town, 2011). Moreover; Collins and Grogg (2011) referred to the problem of electronic resources management systems through their survey of 66 academic librarians. Over one-third of the librarians surveyed referred to workflow and communications management as the system's biggest deficiencies, and also noted a lack of flexibility in the workflow. This certainly asserts the need to investigate the library processes further.

Dowdy and Raeford (2014) investigated the workflows of electronic resources in Duke University libraries, where the Electronic Resources Workflow Analysis and Process Improvement Team was born. They analyzed and documented all related workflows and generated some flow chart diagram for the process. Many deficiencies were revealed from the analysis such as ineffective communication, inaccessible information and re-active quality control measures.

Another study that supports investigating the library processes is conducted by Barbrow and Hartline, (2015). The authors state that process mapping help librarians identify and implement improvements in routine work (processes), in addition to the benefit of documenting current processes and sharing understanding of their successful flows and potential breakdowns.

3. Selecting a method
Although many methods for the business process modelling emerged in the literature, there are relatively few studies that have examined what tools or methods are best suited to

analyze the business processes. A particular method may limit the way in which different processes can be characterized. This reason was the main motive behind both the work of Curtis *et al.* (1992) and Luo and Tung (1999).

Curtis *et al.* (1992) proposed four perspectives in modelling the business processes:

(1) "functional" perspective, where the process elements to be performed are identified;

(2) "behavioral" perspective, which presents a model that specifies when process elements are allocated and how related actions are performed;

(3) "organizational" perspective, which determines who performs process elements and where, and finally; and

(4) "informational" perspective, which presents what informational entities are produced by a process such as data, documents, etc.

A later related study by Luo and Tung (1999) produced a framework for selecting the business process modelling methods based on modelling objectives. This work is interesting as it starts with setting the objective behind the process modelling which then leads to determining the perspectives from which those processes can be viewed.

The objectives in this study were classified into three categories: when process modelling aims to simplify, clear and facilitate business processes by agreeing on a common representation among people in an organization, then the objective is "communication". However, when analysts attempt to model processes for analysis and improvement purposes then the objective is "analysis". Finally, when there is a need for managing and monitoring processes then the objectives could be "control".

After determining the objective, it is now time to view business processes from certain angles. The classification of Luo and Tung's (1999) perspectives is quite similar to the one proposed by Curtis *et al.* (1992) which was mentioned earlier. Luo and Tung (1999) suggested three perspectives: "object", "activity" and "role" perspectives. The first one is similar to the functional and informational perspectives mentioned by Curtis *et al.* (1992), activity perspective is the same as the behavioural one, and finally, the role perspective represents a business process in terms of roles and their relationships, which is similar to the organizational perspective. Table I summarizes the two frameworks, and the arrows show the relationship between the perspectives suggested by both studies.

ARIS however has not been in the academic library environment before. This paper explores the possibility of using ARIS as a modelling tool for the following reasons:

• Setting "analysis" as an objective leads to choosing the "role perspective" for viewing processes (Luo and Tung, 1999).

• Viewing business processes from behavioural/organizational perspective makes the "role" a good focus here, as staff can relate to the ideas of responsibilities (who does what) (Luo and Tung, 1999).

ARIS supports the concept of role as one of the wide variety of easy-to-use diagramming tools it provides for enterprise-wide business process design. The architecture produced can also be documented for later use. Process architecture is a concept of central importance for any work with processes.

4. Methodology – ARIS

4.1 ARIS architecture – concept

ARIS has been developed by Professor A.W. Scheer and is a typical example of defining standardized general concepts – what's so called architecture (Rippl, 2005). ARIS provides models for creating, analyzing and evaluating the business processes. One efficient

Curtis et al. (1992) proposed four perspectives in modelling business processes:	Luo and Tung (1999) proposed a framework for selecting business processes based on two steps:
	Step 1: determine the objective behind the process model, these are:
	• Communication
	• Analysis
	• Control
	Step 2: perspective classification:
Functional perspective	Object perspective
Informational perspective	Role perspective
Organizational perspective	Activity perspective
Behavioural perspective	

Table I.
Comparison of two frameworks for modelling business processes to select a suitable modelling method. The arrows indicate similarities

advantage of ARIS is the several views of the architecture provided, which reduces the complexity and ambiguity resulted by other models when attempting to produce a comprehensive architecture for complex organizations. The relationships between the different views in ARIS are strictly defined. Figure 1 introduces ARIS House of Business Engineering.

From Figure 1, the organizational view represents the uses and units within the organization (who), the data view refers to information objects (what information), the process (control) view refers to the functions to be performed (is doing what), the function view represents the activities, and finally the product refers to the output provided (a service or product). For this paper, the main interest will be in the process view, since the main aim of this work is to visualize academic library processes in an architecture diagram.
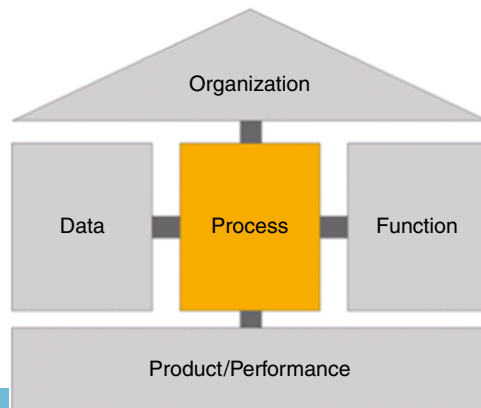
Figure 1.
The general schema of ARIS architecture (ARIS HOBE)

The other robust approach provided by ARIS to reduce complexity is introducing different descriptive levels, leading analysts from the business problem down to the technical implementation (Rippl, 2005) (see Figure 2).

As stated by Rippl (2005), "the essence of ARIS architecture is the combination of descriptive views and descriptive levels. Every descriptive view is described at the three levels of requirements definition, design specification, and implementation" (see Figure 3). Tang and Hwang (2006) state that consistency between enterprise application programs and information technology can then be understood clearly through this distinction of these three levels.

This adds advantage to ARIS over other modelling tools such as UML and Integrated Definition Function Modelling, in that it conducts a more detailed breakdown from four views, resulting in a less complicated architecture that becomes part of consecutive improvement cycle (Tang and Hwang, 2006; Christian *et al.*, 2006).

4.2 Process (control) view

The process view is selected from ARIS to be applied in this paper to model academic library processes. "The relationships between the objects of the data organization and function views are analyzed in the control/process view" (Rippl, 2005). The sequence of functions is represented in process chains. The ARIS process architecture used is divided into four distinct levels:

- Level 1: in which main processes are positioned at the strategic level of the organization such as management processes and core processes. They consist of sub-processes.
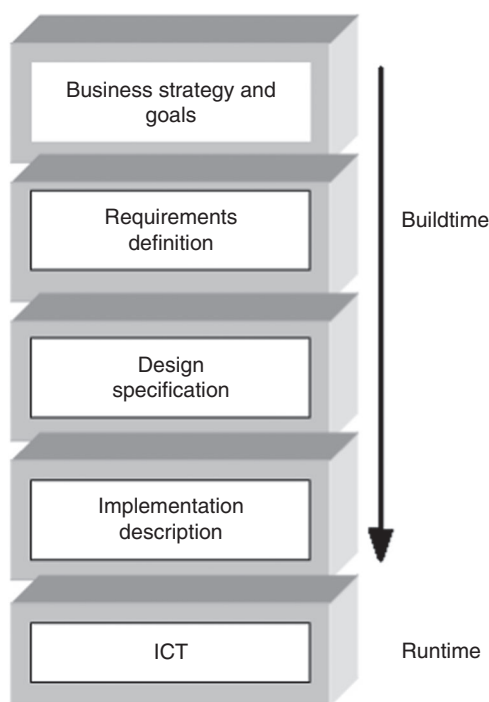
Source: Kozina (2006)

Figure 2.
ARIS descriptive
levels

Source: Heinrich (2004)
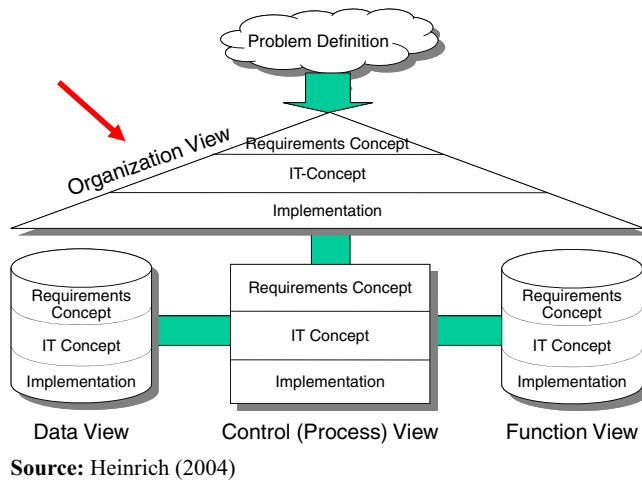
- Level 2: in which sub-processes are listed. They are business management oriented value-added chains.

- Level 3: in which activities can be executed independently of one another. They represent the "every day to day work".

- Level 4: where work steps cannot be broken down further in business management terms, and they can be executed by one person.

There are various diagrams provided by ARIS at this level such as an Event-Driven Process Chain (EPC), classifications diagram, Value-Added Chain Diagram, and more. For this research, the Value-Added Chain Diagram will be used to view the academic library architecture, while the EPC will be used to model one selective process as an example of a detailed process that comprises a group of activities.

5. Academic library processes

In the UK, the term information services is usually used to represent the library and all IT services for academic purposes. It oversees the provision of library services for research and teaching. The processes included in the architecture are common in most academic libraries. The architecture provided is at a high level of abstraction, to provide a broad comprehensive picture that is hoped to encourage librarians to look deeper into processes, and suggest some pruning if needed. The list below introduces the processes selected to be included in the process architecture. This list was created in 2008 when the researcher collected data for the PhD thesis from four different university libraries; two from the UK and another two from Jordan. For verification purposes, and to make sure that the list is still valid, the researcher sent it again to a librarian in one of the two UK university libraries to recheck the processes' list. Two processes were added to the previous list: digitization and information literacy.

It is essential to stress that some academic libraries may have additional processes, or lack some of the mentioned here, however, the process architecture developed by ARIS in this work looks at generic academic library processes, which are as follows:

(1) Acquisitions: it is a common process in all libraries, usually divided into books and periodicals acquisitions. Each of these processes consists of two sub-processes:

"pre-order check", and "order journal". As will be seen later (Figure 5), the pre-order check refers to some procedures that must be followed before making an order, to ensure that the requested journal does not exist in the catalogue and – at the same time – falls within the budget. After these checks, the acquisitions team can proceed with the order.

(2) Cataloguing and classification: another common process in all libraries.

(3) Thesis handling: theses play a major role in the educational experience. Many institutions now believe that it is essential to make their research available to other scholars. Handling theses is a very important process as theses are now getting into universities' digital repositories.

(4) Annual journal review: a process that takes place annually in an attempt to assess the value of journals to either keep the journal or unsubscribe and replace it with other journal.

The four processes mentioned above belong to a main process in academic libraries called "collection and resource management" (see Figure 4).

(5) Information literacy: new in academic libraries. "Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information". Information literacy has been utilized in parallel with information technology to enable learners to locate, analyze, share, communicate and evaluate information. Information literacy is crucial as some students cannot make effective use of library resources to serve their academic needs.

(6) Learning and teaching: new teaching methods are emerging in this era of rapid development of information and communication technologies. One example is
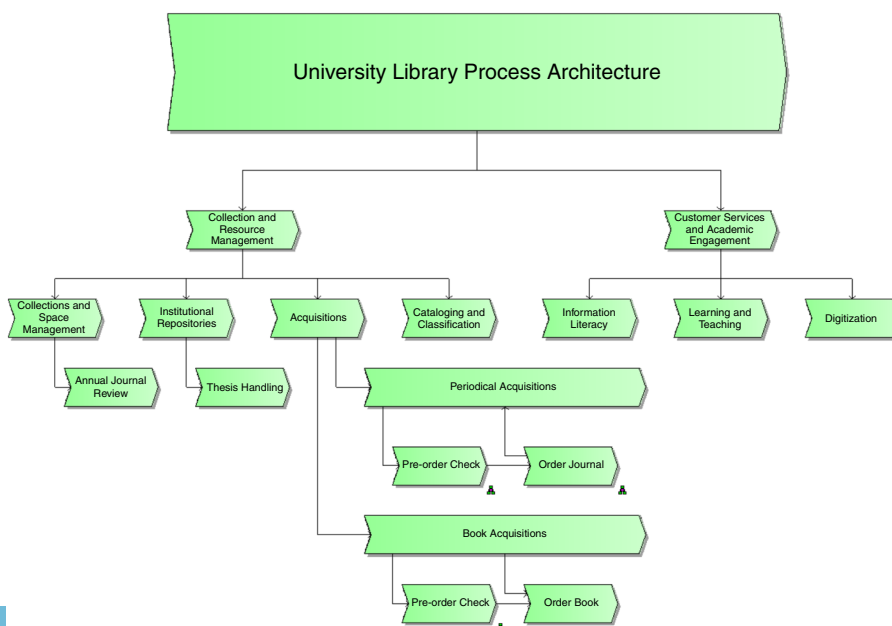
Figure 4.
Process architecture for academic libraries using ARIS Value-Added Chain Diagram

distance learning and all associated processes. Therefore, academic libraries should cover this type of learning by providing sufficient resources and convenient access to them.

(7) Digitization: academic and research libraries have become increasingly interested in using electronic resources, and therefore, converting their materials from print into digital format. Mugridge (2006) states that digitization projects are relatively new endeavour for most libraries. There has been a challenge in creating digital material and also in digitizing current print materials.

The three processes mentioned above fall under a main process in academic libraries called "customer services and academic engagement", see Figure 4.

For this research, the university library process architecture is provided (see Figure 4). In addition, the periodicals acquisitions process is selected to be modelled in detail using the EPC diagram. Note that as mentioned before in Section 5 (point number 1), the periodicals acquisitions process is divided into two sub-processes: pre-order check and order journal, as illustrated in Figures 5 and 6.

6. Modelling

This section is divided into three parts: the first part looks at ARIS as a tool and identifies the notations used in the diagrams; second part introduces the PAD for academic libraries including the processes listed in Section 5; and the final part, however, views periodicals acquisitions process as a sequence of activities using the EPC model in ARIS.

6.1 Modelling tool notations

As mentioned previously in Section 3, ARIS is selected in this research to model the academic library process architecture and one selected process using the EPC model. The software used is ARIS 7.1. ARIS provides a large set of modelling diagrams that comprise many notations. For this work, two diagrams will be used, therefore, only the set of notations used for these diagrams will be explained, see Table II.
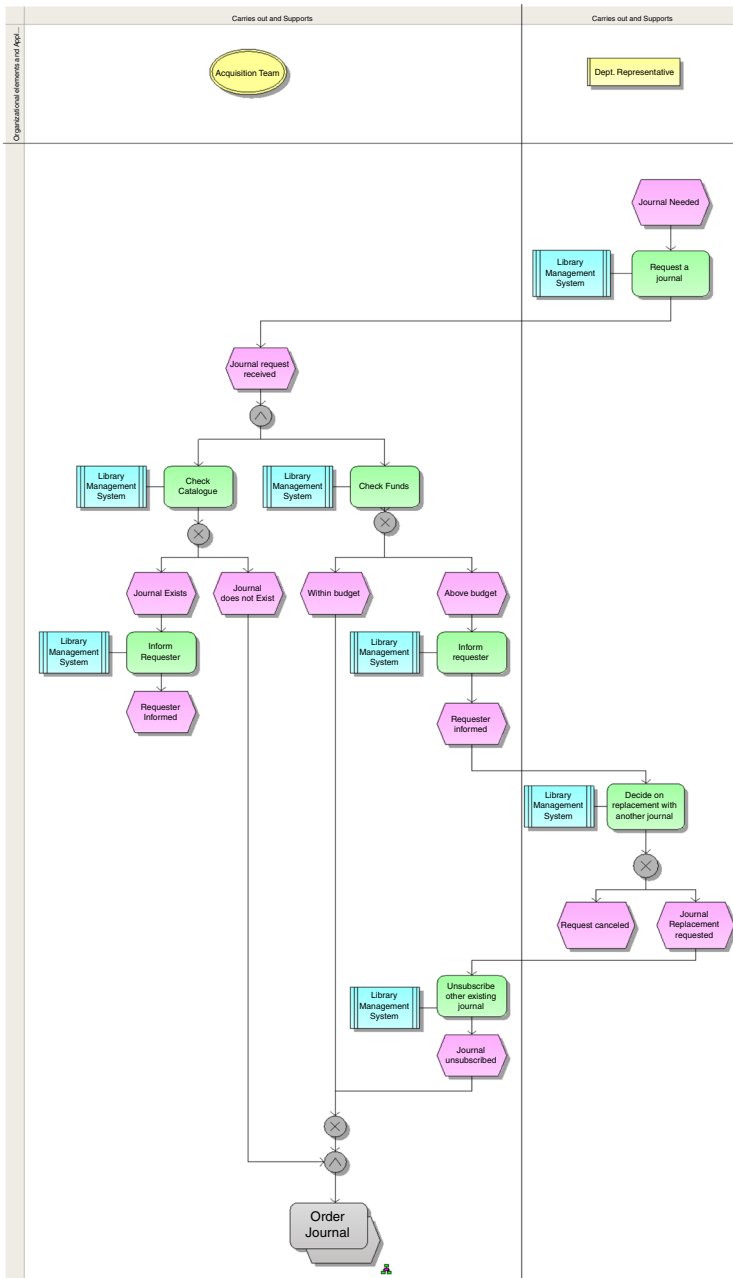
6.2 The PAD

There are many processes dealing with different aspects of the organization's life. Some of these processes are vital, some take long to run while others end quickly or operate on a day to day basis. These processes together represent what the organization does. Ould (2005) argues that a process is about people doing business, how they do it, how they think they do it and how they can make it better. A process is basically a set of activities that interact together to achieve a certain goal. These are generic processes. Section 5 explained the processes and sub-processes to be included in the process architecture for academic libraries, and these are illustrated in the Figure 4.
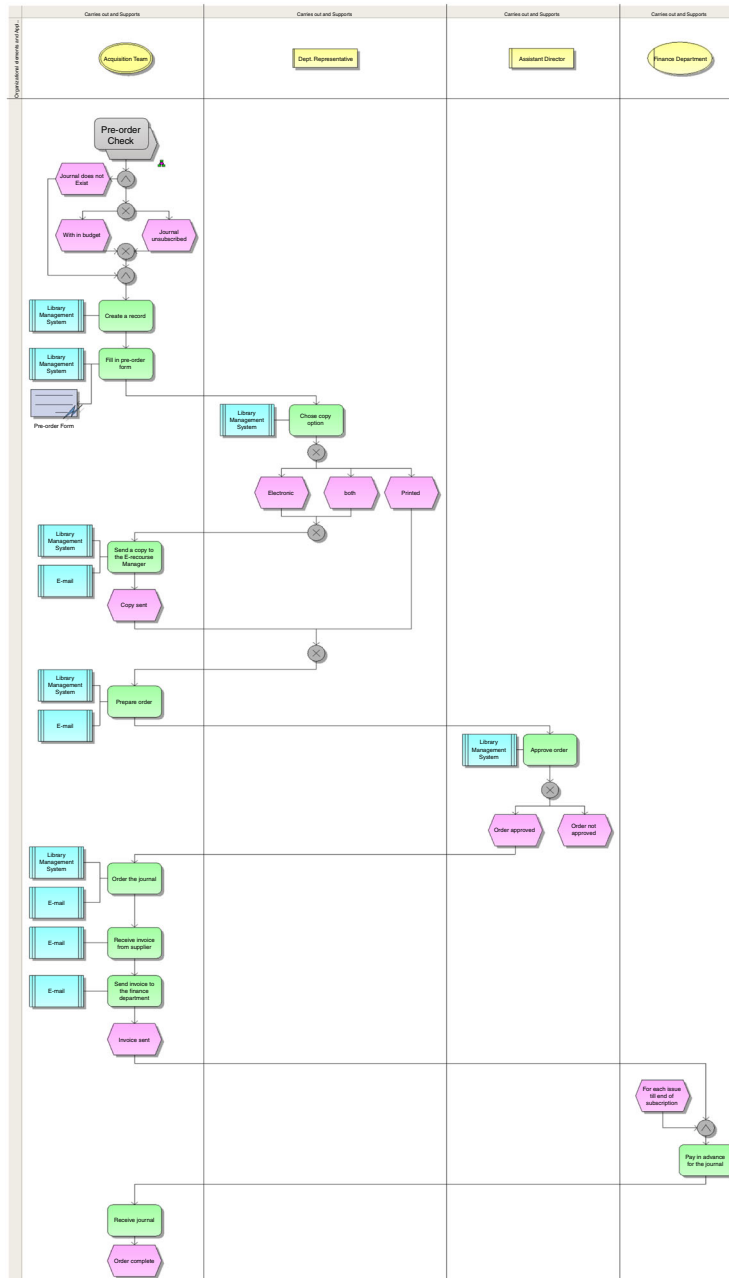
6.3 The EPC model for periodicals acquisitions process

In the UK university libraries, the process of periodical acquisitions for both print and electronic versions can be modelled using one diagram, the same people are involved in the process and they do essentially the same job for ordering both print and electronic periodicals. The main aspects of journals acquisitions that should be taken into consideration when ordering them are: selection, placing order, acquisition and budgeting. The main roles (positions/position types) involved in this process are as follows:
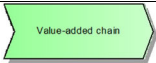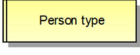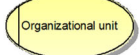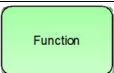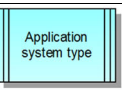
(1) Acquisitions team: the acquisitions team is responsible for ordering all materials in the library such as books and journals.

Figure 6.
EPC Diagram for the
second sub-process
(order journal) in
periodicals
acquisitions process
in academic libraries

Process architecture diagram notations	
	A process such as acquisitions
	Connection
	This symbol under some processes means that the process can be double-clicked to lead to the Event-Driven Process Chain (EPC) associated with the individual process
EPC diagram notations	
Notation	Example from this work
	Acquisitions team
	Assistant director
	Department representative
	Finance department
	Pre-order check
	Journal unsubscribed
	Create a record
	Library management system
	Electronic document
	XOR rule – Either this option or that option
	AND rule – This option and that option together (in parallel)
	OR rule – Either this option or that option or both

Table II.
ARIS notations used
for the Value-Added
Chain Diagram
and the EPC diagram
in this work

(2) Department representative: in each teaching department there is a person whose job is to liaise with the library to facilitate the ordering process.

(3) Assistant director: the second person in the library hierarchy, who is in charge of the library services and day to day library services and plans for the future.

There are other roles involved in the process but can either be considered external roles (such as the supplier), or are internal in the library but do not take decisions in this specific process, rather, participate in the process indirectly (such as sending copy of the order to the electronic resource manager and dealing with payments by the finance department), these roles are identified below:

(1) supplier: refers to the different providers the library deals with, to purchase books, journals or any library material;

(2) electronic resources manager: responsible for managing e-resources; and

(3) finance: deals with payments.

Following is the EPC model for periodicals acquisitions process divided into two sub-processes, as illustrated in Figures 5 and 6.

7. Results
Throughout this work and after demonstrating generic academic library architecture along with one example of a detailed process, it was found that ARIS acts as a powerful modelling tool to illustrate organizational processes, including academic libraries. ARIS provides the following features:

(1) clear understanding of the core processes/sub-processes within the organization; and

(2) visualization of processes within an organization and the possibility of levelling.

As can be seen in the next figure, the database created is called "library". The main groups that comprise the main processes are also listed. It is clear how they contain further processes until they finally reach the EPC model (which can be recognized from the symbol ⬛ : that refers to the EPC model). Note that the EPC model opened in this snapshot is for the process of periodicals acquisitions: pre-order check.

(3) Clarifying the workflow between the functions. Workflow refers to passing objects from one unit or workplace to another. In information systems, this is done electronically. Scheer and Nüttgens (2000) states:

This requires a detailed description of the procedure, customized for the individual process type, and of the respective employee. In many operational or repetitive procedures (such as order or loan processing), functions, their procedural branches and organizational units are determined from the start. Thus, the process is well-structured and can be described with the EPC method. On the other hand, other processes can only be described partially since functions become apparent during the process.

In this work, the functions in the process are well determined and can be modelled using the EPC diagram. The order of the functions undertaken in the process and how the work is done is illustrated in the EPC diagram, for example, in Figure 6, the function "create a record" takes place before the function "fill in pre-order form". In addition,

the achievement of parallel conditions (events) in order to go forward for another step is illustrated too, for example, in Figure 6, the events "within budget" and "journal unsubscribed" should both be tested simultaneously to be able to move to the next step.

(4) The models created act as an analysis method that can be documented for further work or for any new appointed staff (documentation purposes). The models are printable and can be kept for documentation purposes, or for new staff coming in, to be able to understand the processes and the detailed activities undertaken within those processes.

(5) The use of database to build the models enables a number of stakeholders to work simultaneously. The database built can be seen in Figure 7. Different stakeholders can work on the database simultaneously as long as they have the authority to log in. Figures 8-10 illustrate how a user can log into the database using their specified user name and password. After that the user should select the type of filter administration and the language preferred. In this research, the type of filter selected is "entire method", which is the least restricted, allowing users to see the full capabilities of ARIS. The log in step and the selection from various filters administration means that different stakeholders can gain different authorities, for instance, acquisitions are authorized to do certain functionalities different from cataloguing and classification staff.

(6) ARIS various products (e.g. architect and designer) support governance; different stakeholders can gain different authorities. In this work, the user used ARIS designer to build the models. ARIS designer and ARIS architect are quite similar when used for modelling; the main difference is that ARIS architect has additional ARIS
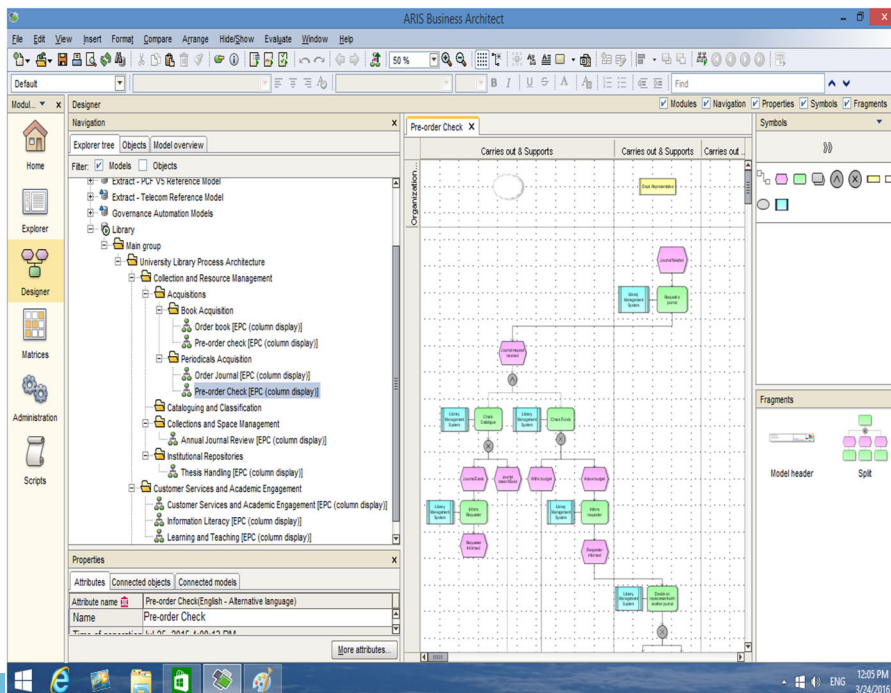
Figure 7.
ARIS designer page
that comprises the
database "library" and
all embedded
processes

Figure 8.
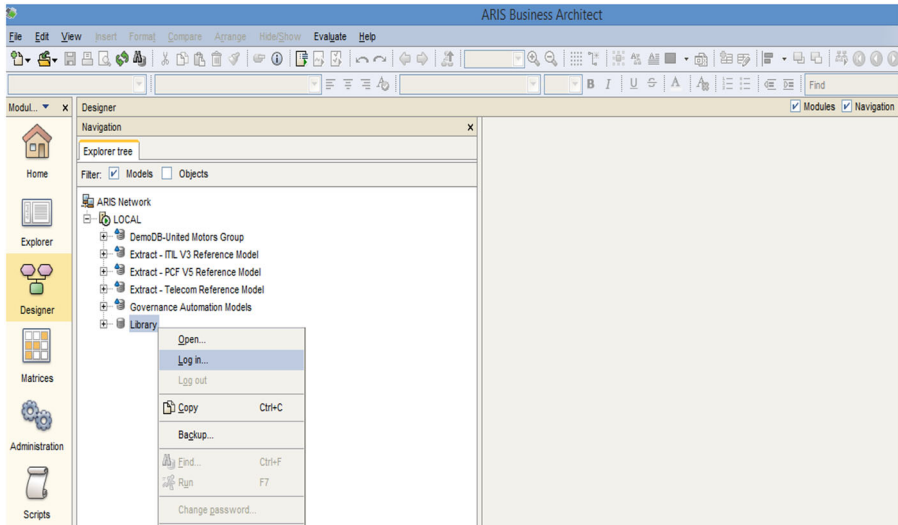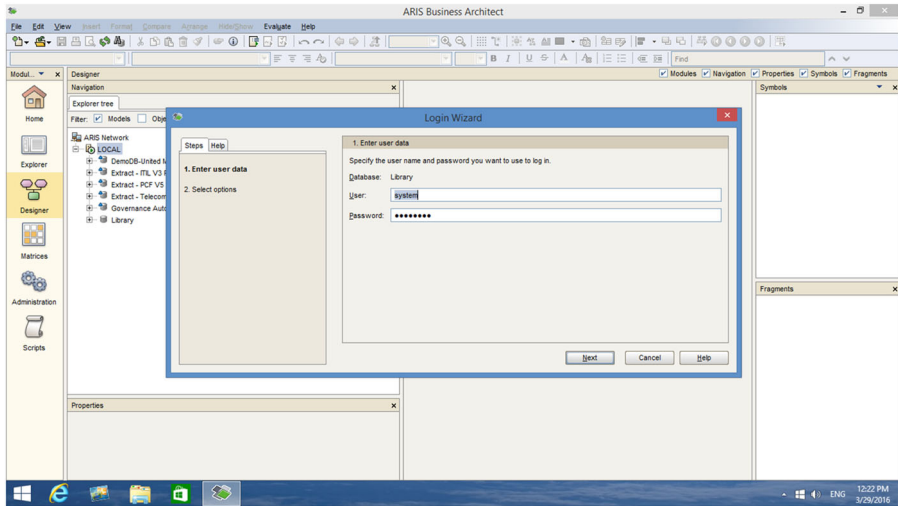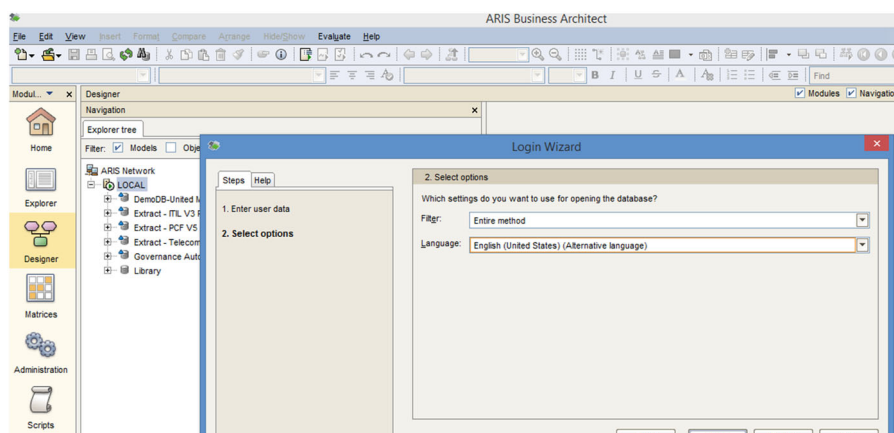Log into the database
"library" – step 1

Figure 9.
Log into the database
"library" – step 2

administration facilities. ARIS designer, however, can only be used via the organization server and only if the organization gave access to it. However, experienced users may install ARIS server on their local PC, which is the case for this research.

(7) Reporting – the use of "positions", "position types" and other notations that represent roles and departments, enable issuing reports that embrace all duties of that specific position. There are plenty of automated reports that can be generated by ARIS for analysis and documentation reasons. In relation to the process of "order a journal" for example, "output functions with organizational elements, data elements or application systems" report was generated (see Appendix 1). This report was generated automatically to illustrate the
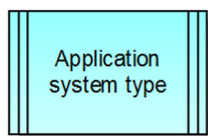
Figure 10.
Log into the database
"library" – step 3

relationships between objects in the process. Another example of an automated report is a generated sheet for analysis purposes, in which organizational changes are analyzed (see Table AII).

(8) Similarly, having notations expressing systems such as "application system

type" identifies all tasks carried out by the system. For example; "create a record" and many other functions are carried out via the library management system, therefore, are attached to this notation (see Figures 5 and 6).

8. Limitations
A possible limitation of using ARIS in academic libraries could be the training required to implement and use the tool. ARIS is a professional tool that requires training, librarians may be reluctant to such a change. Moreover, introducing such a tool to be integrated with legacy systems could be challenging.

9. Conclusion
This work investigated the use of ARIS to model academic library processes using the process architecture, and to demonstrate one of these processes (periodicals acquisitions) in detail using EPC model, clarifying all activities within the process. Connecting research with practice is important, and it can be supported by providing information in a structured and organized way (using process architecture). It was found that ARIS is a feasible graphical tool for modelling purposes, and it provides extensive features that facilitate process design.

As mentioned previously, the architecture provided was generic, therefore, more processes can be added. It is expected that such a powerful modelling tool can be exploited to spot any process bottlenecks, and therefore, be used for later process improvement.

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Appendix 1
Server: LOCAL
Database: library
User: system

| Object name | EPC (column display): order journal | | Object name | Object type |
	Object type	Relationship type		
Approve order	Function	is carried out by	Assistant director	Position
Chose copy option	Function	is carried out by	Dept. representative	Person type
Create a record	Function	is carried out by	Acquisition team	Group
Fill in pre-order form	Function	is carried out by	Acquisition team	Group
Order the journal	Function	is carried out by	Acquisition team	Group
Pay in advance for the journal	Function	is carried out by	Finance department	Organizational unit
Pre-order check	Function	is carried out by	Acquisition team	Group
Prepare order	Function	is carried out by	Acquisition team	Group
Receive invoice from supplier	Function	is carried out by	Acquisition team	Group
Receive journal	Function	is carried out by	Acquisition team	Group
Send a copy to the E-recourse Manager	Function	is carried out by	Acquisition team	Group
Send invoice to the finance department	Function	is carried out by	Acquisition team	Group

Table AI.
"Output functions with organizational elements, data elements or application systems" report for "order a journal" process

Appendix 2

Analyze organizational change: organizational change in the process
Creation: 1 April 2016 12:26 PM
Server: LOCAL
Database: library
User: system
File: Report2.xls
Analysis: evaluation of the organizational changes in the process
Models
Main group\university library process architecture\collection and resource management
\acquisitions\periodicals acquisition\order journal (EPC (column display))

Organizational change in the process	Model 1
Number of functions	12
Functions with organizational allocation	12
Number of function transitions	12
Total of allocated organizational elements	4
Organizational units	1
Groups	1
Persons	0
Positions	1
Employees	1
Minimum no. of organizational changes	7
Ratio of min. organizational changes/function transitions	0.58
Maximum no. of organizational changes	7
Ratio of max. organizational changes/function transitions	0.58

Table AII.
Report example –
sheet for analysis
of organizational
changes

Corresponding author
Dina Tbaishat can be contacted at: d.tbishat@ju.edu.jo

www.