Examining knowledge audit for structured and unstructured business processes: a comparative study in two Hong Kong companies

Jessica Y.T. Yip, Rongbin W.B. Lee and Eric Tsui

Jessica Y.T. Yip and Rongbin W.B. Lee are based at Knowledge Management and Innovation Research Centre, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, China. Eric Tsui is a Professor based at Knowledge Management and Innovation Research Centre, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, China.

Received 17 October 2014
Revised 1 March 2015
3 March 2015
10 March 2015
Accepted 10 March 2015

The authors wish to thank the Research Committee of The Hong Kong Polytechnic University for the provision of a scholarship (project code: H-ZW0U) to one of the authors, Miss Jessica Y.T. Yip, to conduct research studies in Hong Kong.

Abstract

Purpose – *This study/paper aims to study the knowledge audit methodologies needed in structured business processes (SBP) and unstructured business processes (UBP) respectively. The knowledge audit methodology used for SBP aims to identify and capture procedural knowledge, while the one for UBP aims to facilitate the sharing of experiential knowledge. The designs of audit methodologies, including elements of knowledge elicitation (KE), knowledge representation (KR), and role of researcher (RR) for SBP and UBP, are proposed in this paper.*

Design/methodology/approach – *Two knowledge audit cases studies were conducted. The first case was conducted in an SBP, and the second one in an UBP. The first case provides a view of a typical knowledge audit in SBP, the limitations are identified. The second case pinpoints the development of a new knowledge audit methodology applicable for UBP.*

Findings – *A significant differentiation between knowledge audits in SBP and UBP is that the knowledge to be captured in the former is procedural knowledge, whereas that to be elicited in the latter is experiential knowledge. The deliverables in the former include lists of knowledge workers, knowledge assets and knowledge inventories, and in the latter include the interplay of interaction between activities, stakeholders and knowledge displayed in the form of a knowledge activity network.*

Originality/value – *This research clarifies and strengthens the position of the knowledge audit by illustrating two knowledge audit methodologies for respective use in SBP and UBP. It points out that the fundamental difference of knowledge audit approaches is attributed to the different knowledge requirements. To cater to the different knowledge requirements, the authors asserted that three basic components of the knowledge audit, namely, KE, KR and the role of the researcher, should be customized.*

Keywords *Knowledge management, Knowledge audit*

Paper type *Case study*

1. Introduction

A knowledge audit is a systematic and scientific examination and evaluation of explicit and implicit knowledge resources in a company, including what knowledge exists, where it is, how it is being created and who owns it. A knowledge audit has long been regarded as the first crucial step in the knowledge management (KM) journey (Liebowitz, 1999; Liebowitz *et al.*, 2000; Henczel, 2001; Tiwana, 2002; Choy *et al.*, 2004). Both academics and practitioners recognized its importance and have applied it for the formulation of KM strategies in different industries, such as telecom industry (Wei *et al.*, 2006), higher education institutions (Biloslavo and Trnavčevič, 2007), the transportation sector (Cheung *et al.*, 2007), the information technology sector and the energy sector (Ragsdell *et al.*, 2014; Shek *et al.*, 2007). Knowledge audits, after many years of research, have developed

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different implementation foci. Some knowledge audits focus on the use of ontologies to represent knowledge audit results (Perez-Soltero *et al.*, 2006); some focus on the knowledge assessment in core business processes. However, up to now, there have been few studies that focus on the differences in the methodologies deployed for auditing knowledge between structured business processes (SBP) and unstructured business processes (UBP). The purpose of this paper is to bridge this gap.

Nowadays, business processes have become less structured, as there is an increasing need for front line workers to make decisions, which could have not been foreseen. In the past, workers mainly followed procedures and guidelines. Now they have to probe, sense and respond to different patterns identified in the workplace (Snowden and Boone, 2007). This is especially true for knowledge-intensive business sectors, such as business, education, marketing, finance and accounting and various professional services. In view of the shift, traditional knowledge audit tools are found to be inadequate in capturing such dynamic nature of the knowledge generated at work. According to Heron (1981), there are different types of knowledge. In SBP, *procedural knowledge* is required for the operation of routine processes, whereas in UBP, *experiential knowledge* is called upon to handle dynamically changing and practical situations. In this paper, two cases of a knowledge audit conducted in Hong Kong companies are presented, one on an SBP and one on an UBP. The methodology developed for these two audits is examined in terms of the knowledge elicitation (KE) method, knowledge representation (KR) method and the role of the researcher (RR).

2. Design of an audit methodology

During the days of mechanization and mass production, the key competitive factor was standardization in order to arrive at cost reduction. This has resulted in the widespread use of industrial engineering techniques to set up standards of practice and quality assurance in the production control of both goods and services. When the business processes are more structured and the knowledge is mostly explicit, organizational knowledge can be more systematically codified, stored and re-used. Knowledge audit methodology such as STOCKS (Shek, 2007; Shek *et al.*, 2008) emphasized on the codification of knowledge sources (knowledge owners), skills and experience, documents and the recipients. The emergence of factory and office automation brought about by the growing adoption of information and communication technology technologies has changed the business landscape tremendously and has re-written the competition game from mass production to mass customization. Products in smaller batch sizes are possible and services can be tailor-made to individual customers. Knowledge becomes more dynamic and tacit in nature. The amount of useful and working knowledge in companies resides more in the heads of its employees rather than in the corporate repositories. This paradigmatic shift in the nature and location of knowledge has spawned new challenges as how to elicit tacit knowledge and to represent them in a form that is deemed useful to an organization.

There are different methods in which knowledge can be elicited (Cooke, 1994; Gavrilova and Andreeva, 2012) and represented for computers to process and humans to visualize. According to Davis *et al.* (1993), all representations are imperfect approximations to reality. The selection of a representation scheme ultimately determines about how and what are being perceived in the world and such selection could not be isolated from the beliefs and

worldview of the researcher. Therefore, there are three important elements to consider in the design of any knowledge audit methodology: the knowledge elicitation method, the knowledge representation scheme and role of the researcher (Figure 1).

2.1 Knowledge elicitation

KE is regarded as an important step in the early stages of knowledge audit projects (Snowden, 2000). It is a sub-process of knowledge acquisition, which is itself a sub-process of knowledge engineering (Cooke, 1994). Asking what people know directly is futile, as knowledge is tacit in the heads of people. People know what they know and can tell what they know only in an appropriate context when the situation demands. Apart from procedural knowledge (Bruning *et al.*, 1999), which is more linear and depends on memory, other forms of knowledge, such as practical or experiential knowledge, cannot be directly captured as if they were a kind of entity.

2.2 Knowledge representation

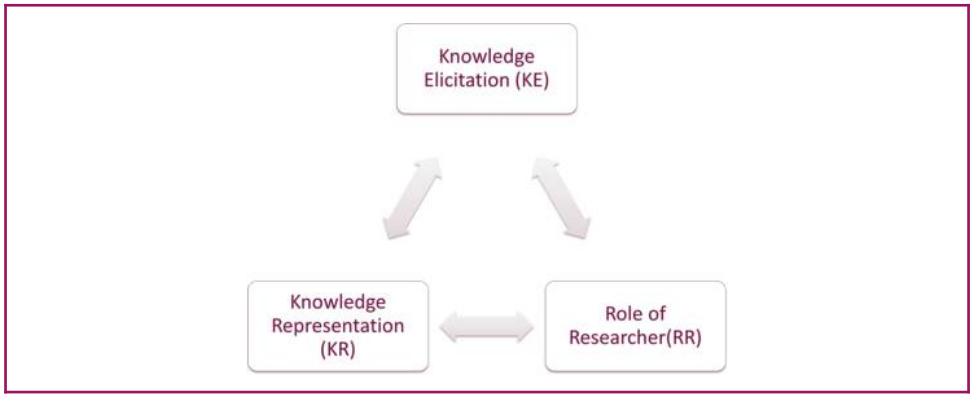
KR refers to how the knowledge will be represented in a form that is meaningful to the users and computers for further interpretation and processing. KR concerns how people store and process information. It includes a variety of schemes that organize, manage, retrieve and visualize the information (Hodge, 2000). KR examines the use of visual representations to improve the management of knowledge assets (Eppler and Burkhard, 2007). One of such visual representations is knowledge mapping, which could be used to reveal the relationship between project components, and technologies (Yun *et al.*, 2011) and express organizational knowledge in hierarchical structures (Štorga *et al.*, 2013).

2.3 Role of the researcher

Researchers in social sciences generally impose their perspectives on the design and findings in the investigation of different extents. There are three roles of researcher, namely, first-person, second-person and third-person inquiry (Hynes, 2013; Torbert, 2006). First-person involves questioning into one's own engagement. Second-person focuses on inquiry with others, while the auditor keeps the role of an outsider in the third-person approach. Usually, in conducting a knowledge audit, the researcher would take the role of a third person. However, how the researcher guides respondents to elicit knowledge depends on his/her laden value and facilitation skills. The participants could be influenced by the wording, instructions and examples given by the researcher. The minimization of the influence of the researcher is a factor to be considered in knowledge audits.

In the following, the differences in KE, KR and RR in conducting knowledge audits for SBP and UBP are explicated.

Figure 1 Three core components in knowledge audit



2.4 Structured business processes

SBP represent business activities, which can be modeled step by step, from the starting to the stopping events, accounting for all possible paths, execution techniques and events. There are rare exceptions from the core process, as most permutations have been studied and codified by experts. Inputs and outputs of these processes can be clearly listed and thus procedural knowledge can be transferred to new colleagues. Procedural knowledge, being referred as knowing how to perform certain activities (Bruning *et al.*, 1999), can be identified and captured by the KE, KR and RR steps listed in Table I.

In SBP, direct KE methods (such as interviews, questionnaires and focus groups) were used to obtain procedural knowledge by directly questioning respondents on how the tasks were performed (Sánchez and Fernández-Sánchez, 2010). The elicitation questions are usually pre-defined according to the research objectives and the thoughts and assumptions of the auditors. As the flow of direct KE sessions follows the plot set by the auditor, the elicited results usually affirm the auditor's prior thoughts and assertions.

In knowledge audit methodologies for SBP, traditional process-based KR tools are usually adopted. These methods represent procedural knowledge, which is technical and process-based in nature, in simple data types, such as flowcharts, inventories, subject-specific techniques, methods, skills and algorithms. The major purpose in these representation methods is to provide an easily comprehensible view for readers to find out the required information.

The existing knowledge audit methodologies rely on auditors to conduct the knowledge audit, analyze the knowledge audit results and subsequently suggest and implement the KM recommendations. This process has not considered collective sense-making at the investigation site. The respondents usually count on the auditors' advice as to which directive instruction to follow. Furthermore, due to a deeply rooted culture of reliance on professional expertise in many organizations, respondents are not eager to share their perspectives for the betterment of the project.

A process-oriented knowledge audit tool, which is suitable for use in SBP, has been developed by The Hong Kong Polytechnic University (HKPolyU) (Shek, 2007; Shek *et al.*, 2007, 2008). This knowledge audit tool is named as STOCKS (**S**trategic **To**ols to Capture **C**ritical **K**nowledge and **S**kills). STOCKS has proven its usefulness in enhancing a company's capabilities in managing business processes. According to Wu and Chen (2014), capabilities in managing business processes have a positive effect on the performance of a KM-driven firm. STOCKS has considered the KE, KR and RR elements mentioned above. STOCKS has been proven to be a useful knowledge audit tool to identify procedural knowledge in SBP across industries.

2.5 Unstructured business processes

As the paradigm of SBP arises, it is found that not all business processes are predictable. Real-world processes are sometimes executed with little structure, imperfect information and unforeseen exceptions, leading to the emergence of UBP (Yip *et al.*, 2012). The operations of these UBP require workers to possess experiential knowledge. Experiential knowledge was succinctly defined as "information and wisdom gained from lived

Table I Knowledge audit for SBP

Knowledge type	*Procedural knowledge*
Knowledge elicitation	Usage of traditional interviews, questionnaires and focus groups to elicit implicit knowledge items (known by the staff but not codified)
Knowledge representation	Usage of traditional workflow diagrams to show the people, tasks, skills and document involved in each sequential step
Role of researcher	Act as auditor to design relevant questions, and conduct interviews, surveys and focus groups discussions

experience" (Schubert and Borkman, 1994). Table II illustrates how experiential knowledge can be elicited in a knowledge audit for UBP by the steps of KE, KR and RR, as illustrated in Table II.

The knowledge elicited from UBP is mostly experiential in nature and is difficult to be elicited by questionnaires or traditional interviews (Yip *et al.*, 2011). Workers need to make decisions based on their accumulated experience through recalling and making sense of similar cases and occasions. In UBP, indirect KE methods are used and conducted in a group setting. A commonly adopted indirect KE method is the narrative circle. The use of narrative circles to map out team mental models has been discussed by Zou and Lee (2010), and in the customer service industry by Luk (2008). The narrative circle helps to bring respondents in a contextual setting and thus helps them to emerge with a picture having better understanding on the assumptions and the conflicts of interests. Narratives capture the sequences and context of events as well as the environmental complexity, trigger emotions and strengthen the memory. When people unfold narratives about their personal experiences, social interaction and negotiations take place to recreate the feeling of being "in the field under fire", or in the state of "need to know". Review of extant literature shows that storytelling has been used to elicit tacit knowledge from subject matter experts (Whyte and Classen, 2012).

On the other hand, knowledge audits for UBP need to visualize and represent the interaction among job activities, stakeholders and knowledge assets. This forms the basis for knowledge workers to understand the eco-system in a process. The representation in network format leads to an understanding of the roles, interactions and areas of value enhancement in the process being studied. KR does not aim to mechanistically list down knowledge assets in inventories and tables, but to represent the interplay between stakeholders, knowledge and activities in a network format. The advantage of the network format of representation over linear flowcharts is that it gives a vivid image of people's interactions, instead of a sequence of actions depicted by traditional process flowcharts.

To elicit and mobilize organizational knowledge, RR is crucial. These roles include knowledge mentor, brokers, content editor, gatekeeper (Venkitachalam and Bosua, 2014) and facilitators (also known as analyst and agents) (Gavrilova and Andreeva, 2012). The researcher's role is not to take control and command during knowledge audits in UBP. In contrast, the auditor will act as a facilitator, helping respondents to make sense of the knowledge audit results and to identify assumptions during the discussion. Examples of facilitation tools are the knowledge café and dialogues (Senge, 1990). By means of these tools, group reflection can be facilitated so that solutions of problems emerge.

3. Case studies

The case study approach was adopted in this research. The case study, like other constructivists' research approaches, aims to find out the subjective human creation of meaning through the interaction with respondents, without rejecting outright some notion of objectivity (Baxter and Jack, 2008). It is different from other research methods, including archival analysis, experiments and statistical testings, as it allows researchers to enter the

Table II Knowledge audit for UBP

Knowledge type	*Experiential knowledge*
Knowledge elicitation	Usage of narrative and stories to reveal the contexts, happenings, lessons learned and tacit knowledge
Knowledge representation	Usage of network-based diagram to show the interplay between knowledge, stakeholders and activities
Role of researcher	As facilitator to encourage respondents to share narratives/stories and their perspectives, and to engage in group reflection

investigation site and be involved in the decision-making and problem-solving processes (Rowley, 2002).

The first case was conducted in an SBP, while the second one in an UBP. The purpose of presenting the first case is to provide a view of a typical knowledge audit in SBP. The second case pinpoints the limitations identified from the first case and introduces a newly developed knowledge audit methodology that is applicable for UBP.

3.1 Case 1: knowledge audit in an SBP

3.1.1 Background. The first case was conducted in a safety audit process in a public transportation organization in Hong Kong. The scope of work in the safety audit process includes receiving workplace safety reports, conducting risk assessment and suggesting corrective and/or preventive measures. This process can be broken down into sequential steps. Clear definitions on the roles and responsibilities of the stakeholders have been recorded in detail in a Code of Practice available on the corporate Web site. However, new colleagues often found it difficult and time-consuming to read and digest the detailed and lengthy Code of Practice. The knowledge audit aims to identify critical knowledge items to be recorded in a simplified process guide. The knowledge audit tool STOCKS (Shek, 2007; Shek *et al.*, 2008) was adopted.

3.1.2 Features of knowledge audit for SBP. A set of structured questionnaires was first distributed to respondents to collect basic information on the process flow. The consolidated data collected from the questionnaires were systematically tabulated in explicit and implicit knowledge inventories. These serve as the yellow pages for familiarizing new colleagues with the safety audit process. The auditor then analyzed the collected data of the safety audit process and suggests recommendations to improve the use of knowledge assets in the process. The above steps help to identify critical procedural knowledge assets to be recorded in a simplified process guide.

3.1.3 Results of structured knowledge audit. By the implementation of STOCKS, the critical knowledge items in the process can be elicited. STOCKS also records the major stakeholders involved in the process such that new colleagues know whom to approach to acquire essential knowledge assets in order to operate the safety audit process. As the results of STOCKS can be swiftly generated using the software, auto-STOCKS, developed by the Knowledge Management and Innovation Research Centre (KMIRC), The HKPolyU, it is advisable to implement STOCKS regularly to update the inventory of the knowledge assets in the safety audit process.

3.1.4 Process flowchart. The major goal of the knowledge audit project is to visualize the essential knowledge assets in the safety audit process. Therefore, there is a need to first identify the operational process tasks, and define the scope of the investigation. In this process, eight critical process tasks have been investigated (Figure 2).

Each process tasks can be further analyzed by two criteria listed below (Cheung *et al.*, 2007; Shek, 2007) (Figure 3):

1. *Task uncertainty (uncodified/codified)*: The ratio of the number of identified implicit to explicit knowledge items.

"This paradigmatic shift in the nature and location of knowledge has spawned new challenges as how to elicit tacit knowledge and to represent them in a form that is deemed useful to an organization."

Figure 2 Process workflow of the safety audit process

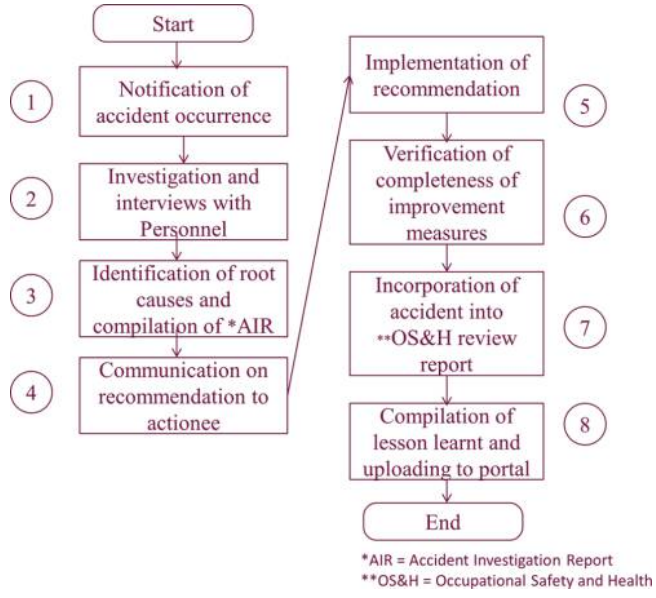
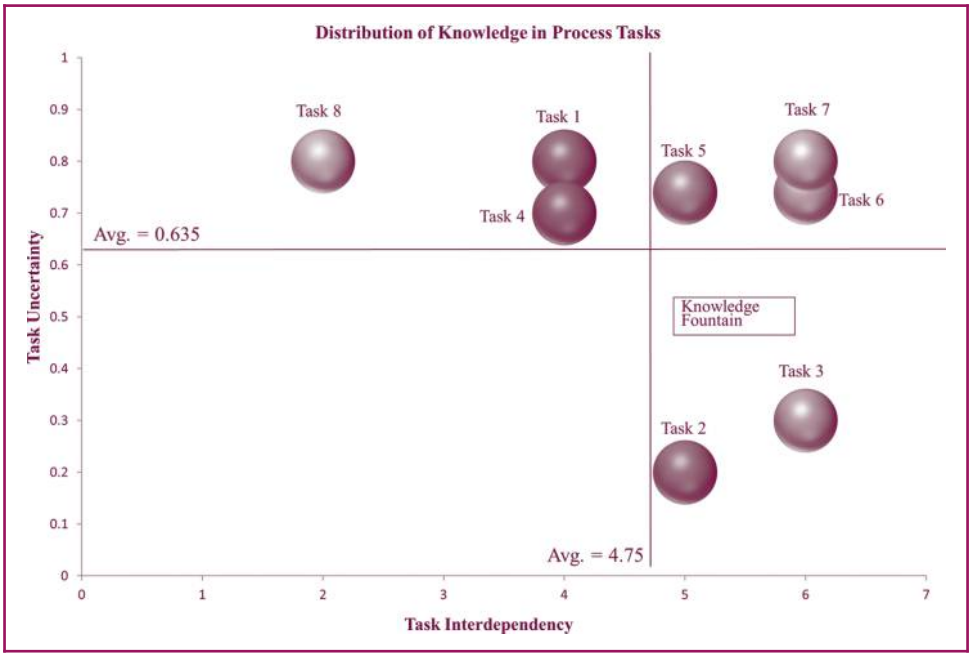


Figure 3 STOCKS analysis – distribution of knowledge in process tasks



2. *Task interdependence*: The number of knowledge workers involved in knowledge sharing in each task.

With the average lines of task uncertainty and task interdependence, the chart is divided into four quadrants. The quadrant in the lower right hand corner represents the knowledge fountain, which has low task uncertainty and high task interdependence. In the safety audit process, Task 2, "Investigation and interviews with personnel", and Task 3, "Identification of root cause and compilation of Accident Investigation Report (AIR)", are the knowledge fountains, as there are many rules and investigation heuristics stated in the Code of Practice.

3.1.5 Knowledge inventory. A detailed record of WHO (owners of knowledge) keeps WHAT information (name of knowledge and its format) at WHERE (sources of knowledge) and WHY (purpose of use) of the knowledge assets can be represented in a table called a knowledge inventory (Table III) (Shek, 2007). This knowledge inventory offers formal and evidence-based accounting to understand what knowledge exists or is embedded in the process, and how knowledge flows through different stakeholders.

Table III A sample of knowledge inventory

Document name	*Step no.*	*Document format*	*Purpose of using*	*Where from*		*Where to*	*Score of importance*
				People	*IT tools*		
OS & H Review Report							
Draft	1	Hard	Accident analysis	Peter	Email, phone, face-to-face	John	3
Commented				John		Peter	5
Modified				Peter	Face-to-face	John	4
Human Factor Handbook	2	Soft	To find out root cause of the accident related to human factors	–	IMS Documentation Shop	–	–
Railway Safety Rules (RSR)			State the accident handling procedures of the line staff				
Standing Operations Procedures Manual (SOP)			The Glossary helps in understanding the meanings of the abbreviations used by the line staff				
Injured Person's and witness's Statements	3	Soft	Giving details on the accident from the perspective of first parties	Nancy	Email or Internal mail	Philip Lawrence	3.5
	4		Completion of lesson learnt by extracting accident information in these documents	–	Email history	Philip Lawrence	2
Photos	5		As evidence to prove that the recommendation improvement measures were completed	Nancy	Email	Philip Lawrence	4.5
	6		Completion of lesson learnt by extracting accident information from these documents	–	Email history	Philip Lawrence	2
Medical Certificate	7		Giving details on accidents from the perspective of first parties	Nancy	Email or Internal mail	Philip Lawrence	3.5
Training record Amended Procedure	8		As evidence to prove that the recommendation improvement measures were completed	Nancy	Email or Internal mail	Philip Lawrence	3.5
CGI 220			Directing investigation to personnel who you should refer to for further accident details	–	Portal	–	–

> **"There are three important elements to consider in the design of any knowledge audit methodology: the knowledge elicitation method, the knowledge representation scheme, and role of the researcher."**

3.2 Case 2: knowledge audit in an UBP

3.2.1 Background. The second case adopted a newly developed knowledge audit methodology for UBP. The case was conducted in a policy development process of a public utility organization involved in joint ventures. This process involves many communication and negotiation activities with a wide range of stakeholders between mainland China customers and joint venture companies, and Hong Kong headquarters. There were no company guidelines on how these policy negotiation processes with the business partners were formulated and with whom. Due to the swiftly changing business environment in mainland China, there was no formal document recorded on how these were done. Company staff found it difficult to attain consensus and come up with knowledge that could be shared in the policy development process. To address the above difficulties, the project aimed not only to deliver knowledge inventory and knowledge assets analysis of the process, but also to help staff to share, internalize and reflect on how they can share the experiential knowledge in the process of policy development.

3.2.2 Features knowledge audit for UBP. There are three operational steps in the knowledge audit for UBP, following the KE, KR, RR characteristics listed in Table II. The philosophy in operating these steps is that a researcher does not impose any pre-conceptions to dominate team discussions. The researcher acts as a facilitator to encourage the team to discuss and share knowledge that is important in the process.

First, to facilitate reflective thinking, indirect KE techniques (i.e. the narrative circle and sense-making exercises) were used to elicit a pool of know-how and values from the participants. The researcher asks participants to recall impressive stories in the policy development process in narrative circle, which offers a comfortable environment for voluntary and in-depth sharing and discussion. According to Teng and Song (2011), voluntary sharing is a more proactive form of knowledge sharing than those that were shared in a solicited form. While the participants are telling their stories, they write down the key phases of the stories and their reflection on posit memos. Subsequent to the KE, the elicited knowledge items are categorized by participants in a sense-making exercise. The posit-memos with similar meanings are clustered together to form themes of experiential knowledge. These themes of experiential knowledge represent their mental models, know-how and values. *Second*, the elicited knowledge further linked up with the work activities and represented in a network structure. Each participant is asked to draw an individual activity map, which are later merged to form a consolidated activity map. The consolidated activity map depicts a visualization of the team's activities in a network format. This step encourages reflection on the elicited narratives and engages in a generative interplay between narratives and argumentative mode of communication, which is important for participants to understand others' perspectives (Geiger and Schreyögg, 2012). Subsequently, participants map the themes of knowledge into an activity network to form a co-constructed knowledge activity network. *Third*, the researcher consolidates and presents the findings of the knowledge audit. The researcher then facilitates participants to engage in discussion of the knowledge audit findings and derives a KM strategy. This process enhances the sense of commitment of the company staff in the project, as respondents tend to treasure recommendations proposed by themselves.

3.2.3 Results of unstructured knowledge audit. In Case 2, the results of the knowledge audit help company staff in sharing their experiential knowledge in the policy development process. The results of the unstructured knowledge audit aim not to develop and generate statistics, tables and charts; instead, the most significant benefit of the unstructured knowledge audit is to help participants to express and share their experience, lesson learned and values to facilitate effective dialogue. Staff members are encouraged to be open-minded, and are receptive to new ideas.

3.2.4 Elicitation of experiential knowledge. To develop the policies for the mainland joint ventures, a lot of negotiation tasks need to be performed between Hong Kong and mainland stakeholders. It is found that the responsible staff's understanding of mainlanders' culture and practices is critical to success in policy development. The knowledge to achieve this understanding is difficult to be revealed to new employees, as they are rarely discussed explicitly. The elicited knowledge assets can help new staff to enhance their skills in handling clients and joint ventures in mainland China. Their ability to make sense of and analyze problems, as well as to derive appropriate handling solutions, is enhanced. An example of experiential knowledge elicited from the UBP to handle practical and complex issues is shown in Figure 4.

3.2.5 Knowledge activity network. As the knowledge activities in UBP are complex, company staff seldom reveal the linkages between different activities, knowledge and stakeholders in the work environment. The unstructured knowledge audit thus visualizes these linkages in a network map, known as a knowledge activity network. The steps in producing a knowledge activity network are discussed below.

The researcher facilitates each respondent to draw up an individual activity map (Figure 5) illustrating their daily work activities (in arrows) and the stakeholders (in nodes) whom they communicate with. These individual maps are then consolidated by combining the same activities (arrows)/ stakeholders (nodes) from different individual maps to form a collective activity network (Figure 6). The respondents are then asked to map the knowledge items needed to perform each activity into a collective activity network (Figure 7).

After mapping the experiential knowledge items with the collective activity network, a knowledge activity network is produced (Figure 8). The intensity of the arrows represents the number of knowledge items attached to the activity arrows. With this knowledge activity network, company staff can see a holistic picture of the unstructured process. Shared information can be achieved, leading to shared control and informed choice. Staff then discuss any KM risks in the process that have been revealed by visualizing the knowledge activity network.

3.2.6 Facilitated discussion on KM solutions. The knowledge activity network allows company staff to visualize the complex activities of the whole company, and enables them to discuss the availability of knowledge to support business transactions. In this

Figure 4 Examples of experiential knowledge elicited from narrative circles

Figure 5 Individual activity maps

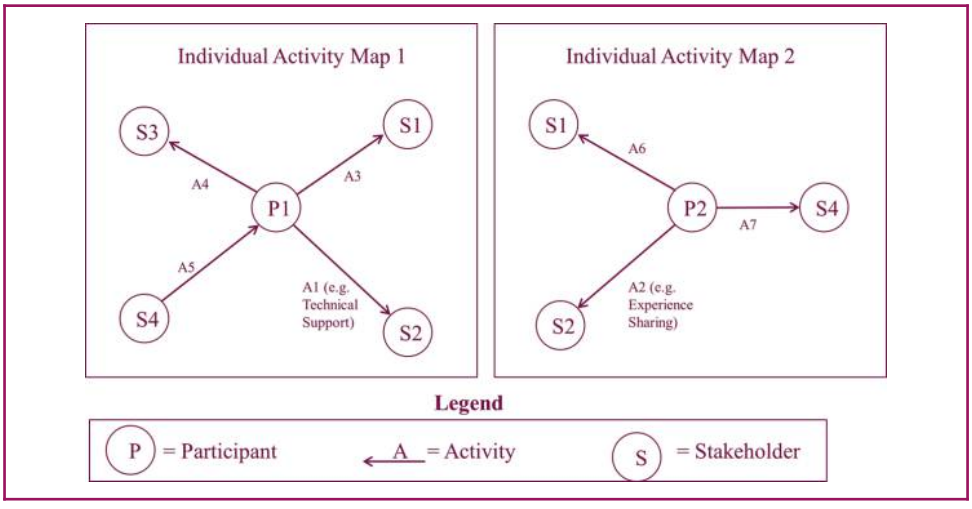
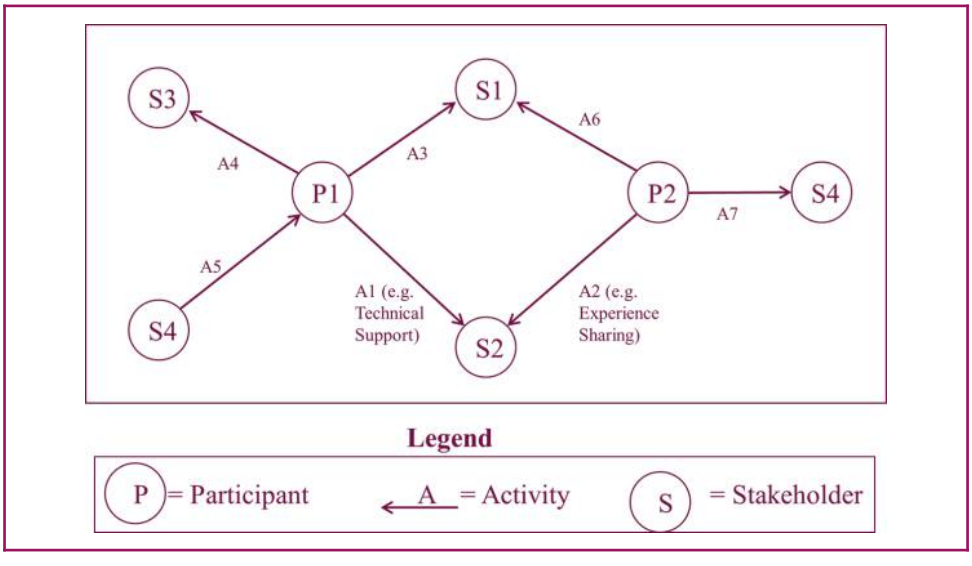


Figure 6 Collective activity network



case, it is agreed that much knowledge is embedded in the activities of "communicate/communicate guideline" with users in joint ventures. After discussion, the team decides to construct a narrative database to record critical practical and experiential knowledge as working tips. These narratives are posted in the corporate portal for knowledge dissemination. Table IV shows an entry of a narrative illustrating an experience in communicating with joint venture companies in mainland China.

4. Discussion

A significant differentiation between knowledge audits in SBP and UBP is that the knowledge to be captured in the former is mainly procedural knowledge, whereas that to be elicited in the latter is largely practical and experiential knowledge. The deliverables in the former are lists of knowledge workers, knowledge assets and knowledge inventories of the business processes. In the latter, the interplay of interaction between activities, stakeholders and knowledge extracted are shown in the form of a knowledge activity network.

Figure 7 Mapping of knowledge items with the collection activity network

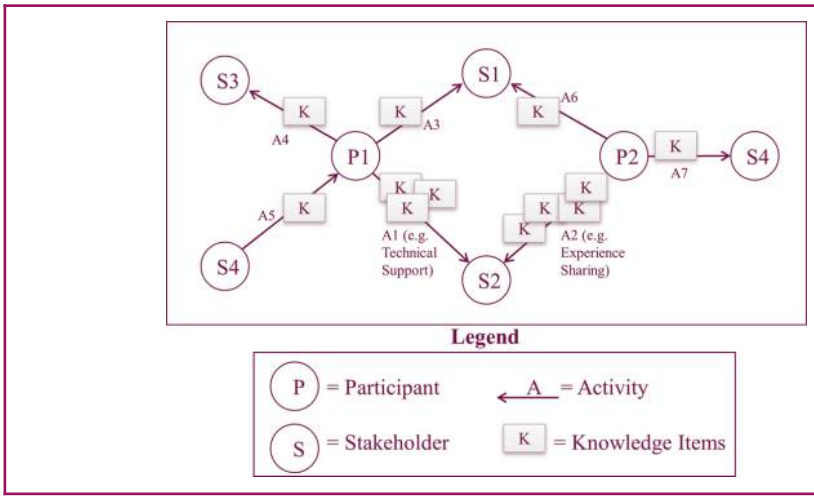
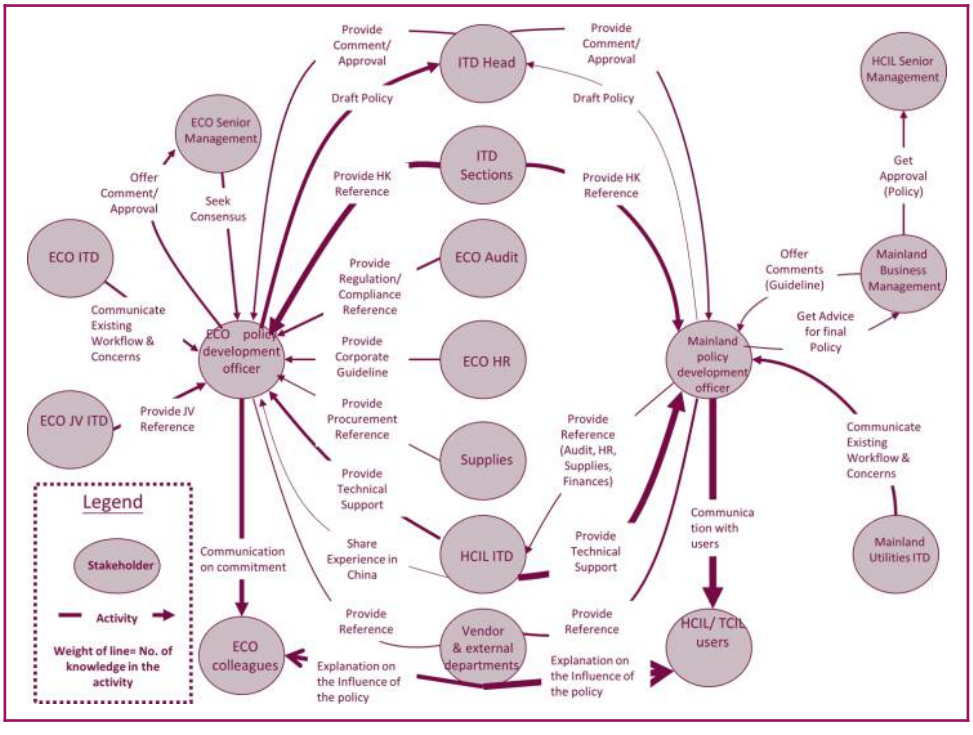


Figure 8 Knowledge activity network, showing the interaction of work activities



In Case 1, STOCKS was useful for the identification of critical procedural knowledge assets, the generation of a concise process flowchart as well as formulation of plans to manage procedural knowledge in the safety audit process of the company. A comprehensive knowledge inventory has been produced for new staff training programs. However, it is noted that STOCKS and similar traditional knowledge audit methodologies have certain limitations. Firstly, they are basically fact-finding exercises. Participants are not encouraged to challenge the validity of the existing practices on the management of knowledge assets and explore alternatives. The situations in which ideas are stopped from emerging due to reluctance for exploration are known as the "premature convergence" phenomena (Snowden, 2006). Villachica *et al.* (2001) also pointed out the problem of direct

Table IV An example of narrative

Narrative	*Identified know-how*
To cope with the expanding business from HK to mainland China, the IT department was preparing to launch a "policy on email security and intellectual property" for their mainland counterparts with reference to an original policy in Hong Kong A junior HK colleague translated the original HK policy (in English) to Chinese. When the translation was completed and sent to the mainland office, it was found that many translated terms could not be comprehended by the staff in mainland China. In addition, there was resistance from mainland colleagues regarding the policy on email security and intellectual property compliance due to the substantial influence on their daily email and operational practices. In respond to these issues, a Chinese mainland staff re-translated the guideline to ensure the guideline could be easily understood in the mainland China context A team of managers and frontline staff was set-up to communicate and present the rationale and content of the policy to different levels of colleagues in mainland China. When the policy was finally being launched, training sessions were offered to users; and technical training to email administrators was conducted. This project took one year to complete. The colleagues involved in the project said when the policy was launched in HK, it only took two months to compile the guidelines and communicate with the stakeholders. The process in mainland China was much more complicated than expected	Ask a staff in the Chinese Mainland to do the translation so as to ensure the terms are understand in the local context Seek assistance from a manager in Mainland China to help the coordination tasks, especially in the communication tasks with local users and senior management Organize training sessions on the topics of email security and intellectual property to users, and offer technical training sessions to administrators

KE methods in dealing with the inability of experts to express fully what they know. As the expert is ignorant about their knowledge as a result of non-conscious learning, the direct method is usually ineffective in the elicitation of tacit knowledge (Richards *et al.*, 2002).

The beneficial outcome of Case 2 lies in the fact that the researcher and leader in the investigation site refrained from dominating the discussion. Instead, an environment to encourage emerging ideas was nurtured. The interactive discussion could generate innovative ideas among staff to reveal critical practical and experiential knowledge in the UBP. This reflects the importance of engaging the respondents in the elicitation process, and minimizing the influence of the researcher/ auditor in the knowledge audit. It is often the case that the researcher/auditor takes the lead to give instructions and guidelines to the respondents, who then rely on their "professional advice" and refrain from providing valuable and contextual comments. Contrastingly, if the researcher steps back and encourages the respondents to voice out their opinions, they will gradually catch the momentum and build up the capability to identify issues and find solutions. In UBP, therefore, it is more desirable that the researchers take a low profile to facilitate the project so that the respondents will learn to communicate and solve their own problems.

5. Conclusions

A comparison of the audit methodologies between SBP and UBP is rare in literature. This project is the first attempt to address such difference. From the two cases presented, it is found that different knowledge audit approaches are needed according to different knowledge requirements. To cater for the different knowledge requirements, the authors

propose three essential components of a knowledge audit, namely, KE, KR and RR, for knowledge audit researchers and practitioners.

For SBP, the use of the traditional knowledge audit (illustrated in Case 1) is appropriate. It uses direct KE, structured KR methodologies and auditor-driven processes. However, traditional knowledge audits have two deficiencies. On the one hand, the focus is mainly on the systematic capturing of information and knowledge assets by direct KE methods (such as questionnaires, interviews and focus groups), which are driven by the auditor's assumptions and pre-defined questions. A knowledge audit for UBP (illustrated in Case 2) is illustrated in which a knowledge activity network is used to visualize the interplay among knowledge, stakeholders and activities. The researcher facilitates the respondents to come up with their own solutions. Such an audit approach engages the participants in sense-making and decision-making processes.

This research clarifies and thus strengthens the position of the knowledge audit by examining two knowledge audit methods for the respective use in SBP and UBP. Knowledge auditors and practitioners can refer to it to determine what kind of KE, KR and RR components should be adopted in their knowledge audit projects. Whereas the former one is adopted for SBP in eliciting procedural knowledge, the more open-ended one is more appropriate for auditing UBP.

On must bear in mind that both SBP and UBP often co-exist in a company or in the same business unit of a company. From our experience of the two companies we have studied, SBP and SBP are not always mutually exclusive. For more established process such as production, maintenance and quality control, the processes are more structured in nature. For R&D, marketing, etc., they tend to be more unstructured. Nevertheless, even in the same department, such as the R&D department and marketing department, those processes which are more matured, documented and structured will become standard practices (the explicit part), whereas there would be areas that are less structured.

The outcome from the SBP and UBP if carried out in the same unit or same company would give an interesting indication of the relative ratio of explicit knowledge to implicit knowledge items that are revealed. Further research will be useful to link up these findings to the formulation of KM strategy based on codification or people-based approach, with the former one emphasizing on the establishment of good standard of practices and the latter on the building of a good organizational knowledge-sharing culture.

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Corresponding author

Jessica Y.T. Yip can be contacted at: jessica.tung.yip@gmail.com