Auditing Organizational Intellectual Assets through an Interactive STOCKS Methodology

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Agenda

1. Introduction
2. What is Knowledge Audit?
4. What does Knowledge Audit involve?
5. Objectives
4. Case Study
5. Conclusion

Introduction

- A knowledge audit is the first step which guides companies towards an informed view of KM. (Liebowitz et al., 1999)
- Hylton (2002) suggests that 80% of KM program fails without KM audit.
- The CEO of Hewlett-Packard Company (HP) suggests that we can gain 3 more times of profits if we know what we have.

Knowledge audit is vital to provide an evidence based assessment of where the organization needs to focus its KM efforts.

What is Knowledge Audit?

Dow, 1997	Knowledge audit is a fact-finding, analysis, interpretation, and reporting activity.
Hylton, 2002	Knowledge audit is a systematic and scientific examination and evaluation of the explicit and tacit knowledge resources including what knowledge exists and where it is, where and how it is being created and who owns it in the company. It also measures and assesses the level of efficiency of knowledge.
Wiig, 1993	By completing the knowledge audit, the auditors can determine the organization's ability in keeping abreast of relevant information, awareness of where to go for expertise in a specific area.

What does Knowledge Audit involve?

- Review knowledge assets
- Identify critical knowledge
- Collect measurable data
- Understand client's perception on KM
- Enhance awareness for KM

Current state in KM

- Strengths
- Weaknesses
- Opportunities
- Threats
- Enablers
- Barriers

Objectives

Objectives

Objectives:

- Study traditional knowledge audit tools
  - Questionnaire survey
  - Face-to-face interviews
- Develop new methodology for knowledge audit which can address shortcoming of traditional approach (i.e. **STOCKS**)
- Trial implement both audit approaches
- Evaluate and compare outcomes

Case Study

Company Background

- CLP Power Hong Kong Limited (CLP Power)
- PSBG (Power Systems Business Group)
  - the largest Business Group in CLP Power
  - responsible for the safe and reliable transmission of electricity from the company's generation facilities

中華電力
CLP Power

- **Mission:**

  To provide a safe and reliable electricity supply at reasonable cost to domestic & commercial customers

- **Project Aim:**

  To identify recommendations to retain the knowledge & enhance the knowledge sharing among different departments

STOCKS Overview

- A new knowledge audit methodology ***STOCKS*** (Strategic Tools to Capture Critical Knowledge and Skills) is being designed & developed which can address shortcoming of traditional approach of knowledge audit

- STOCKS Objective:
  - Identify critical IT tools, technologies, document, tacit knowledge, as well as people of key business processes of PSBG

- STOCKS is a structured, contextual & action-oriented knowledge inquiring tool
- Data & information will be collected through interactive workshops & discussion
- Visualizes & externalizes the existing knowledge environment

STOCKS Approach

Process Prioritization & Selection

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STOCKS Form Filling

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Workflow Study & STOCKS Workshop

↓

Knowledge Inventory

↓

Analysis

↓

Short Interviews & Data Validation

↓

Recommendations

Phase 1 - Process Prioritization & Selection

Criteria for the Prioritization of Processes

- **Impact on PSBG if Knowledge is lost**
  - Affects supply reliability
  - Affects service provision to customers (e.g. new supply network enhancement/expansion...etc)
  - Affects asset performance
  - Affects safety (which causes high consequential damages)
  - Affects costs
- **K-Retention**
  - Chance of losing the expertise is high (e.g. key personnel near retirement age, not many staff have this specific knowledge, high market demand for key personnel involved in the process, high tacit to explicit knowledge ratio)
  - Difficult to replenish experts from labour market (e.g. unavailability of personnel from the market)
  - It takes a long time for a newcomer to pick up the expertise (e.g. the
  - process is complex....etc

Phase 2 - Process Prioritization & Selection

Project Scope of Knowledge Audit

Process Pool of PSBG
50 Processes

2 Key Ranking Criteria for Process Selection

- Impact on PSBG if Knowledge is lost
- K-Retention

AMD	TSD	SOD
Network Planning	High Voltage Testing	System Control of Generation
Asset Development	Switchgear Overhaul	System Control of Transmission
Asset Utilization	Power Transmission	System Control of Distribution

Region	EPD
Maintenance	Cable Design
Fault Handling	
Commissioning	

Over 100 Participants

13 Audited Processes

Phase 2 - STOCKS Form Filling

- STOCKS participants are provided with various forms about...
  - Frequently use **IT tools/platforms**
  - **Documents** flow
  - **Tacit knowledge** flow
    - knowledge sources
      → knowledge suppliers
    - user groups
      → knowledge customers
  - **Industrial technologies**
    (e.g. cable joining technology)

STOCKS Forms – IT Tools/Platforms

Participant: _____ Form 1

Process: _____

Information Technology Tools and Platforms

Please review the following list of IT tools/platforms and provide an indication of how frequently you use them.

	IT Tools and Platforms	How often do you use them?				
		Never	Less than once a month	Less than once a week	Everyday	Always on
e.g.	SAP - EFMS/EWMS	√				
1.	**Intranet(s) - Info Centre / Dept. Centre**					
2.	**Internet**					
3.	**Extranet(s)**					
4.	**Email – Outlook**					
5.	**Shared Network Drive (e.g. k-drive)**					
6.	**Electronic Document Management System - EDMS**					
7.	**Document Workflow Control System - DWCS**					
8.	**KM Portal (PSBG)**					
9.	**Content Management in Enterprise Portal Tool**					
10.	**SAP - EFMS/EWMS**					
11.	**Search and Retrieval (Intranet and Internet)**					
12.	**Bulletin Board/Discussion forum - Discussion Forum at Webpage/KM Portal**					
13.	**Wireless/Mobile Devices/Solutions - PDA application / TETRA Website**					
14.	**Online Communities - iKue Discussion Forum**					
15.	**Trouble Call & Outage Management System - TCOM**					
16.	**Geographic Information System - AM/FM**					
17.	**Mind/Process Mapping – iKue**					
18.	**E-learning**					
19.	**Others (Please specify):**					
20.	**Others (Please specify):**					
21.	**Others (Please specify):**					
22.	**Others (Please specify):**					
23.	**Others (Please specify):**					

STOCKS Forms - Documents

Participant: _____ Form 3

Process: _____

Document Sent / Submitted / Forwarded / Uploaded / Produced

Please list the document(s) and associated information you send/submit/forward/upload/produce when you carry out the tasks.

Document Sent / Submitted / Forwarded / Uploaded / Produced		Task(s) No.	Rating on the ease of obtaining the document*	Rating on the importance of the document to the process**	Document Format					Destination of Document						
					Hardcopy			Softcopy					People		IT Tools/Platforms No. (Refer to Form 1)	Others (Please specify)
					Printed	Fax	Hand Written	Format (e.g. word, PPT, excel, pdf, etc.)	Multi-media file (e.g. movie, voice file)	Within Your Dept.	Other Dept. (Please specify)	External to CLP	(Write down the name of the person / dept. who you pass the document)	Self-use only		
e.g.	Maintenance Manual (MM-04-198)	P6	4	5	√			pdf		√		√	ABC Company		6	
e.g.	Market price analysis report of competitors	P5	3	2	√			pdf		√	AMD		David Wu (SOD), June Lee (AMD)		2	
1.																
2.																
3.																
4.																
5.																
6.																
7.																
8.																
9.																
10.																

* Rating on the ease of obtaining the document: 1 – Very difficult ; 2 – Somewhat difficult ; 3 – About right ; 4 – Relatively easy ; 5 – Easy

** Rating on the importance of the document: 1 – Not important ; 2 - Least important ; 3 – Somewhat important ; 4 – Important ; 5 – Very important

Remark: Please state in which of the tasks of the process you need to sent/submit/forward/upload/produce the document and give rating on the ease of obtaining it as well as its importance to the process. Please then state the format of the document, either in hardcopy or softcopy. Following is to state whether the immediate source of the document is internal or external and name of the person/department who passes the document directly to you. You may also write down the IT tools/platforms or other places where you retrieve the document from.

STOCKS Forms – Tacit Knowledge

Participant: _____

Process: _____

Form 4a

People You Usually Consult for Advice on Technical Knowledge

People You Usually Consult for Advice on Technical Knowledge		Describe the technical knowledge requested (e.g. experience, skills, know-how) in a key phrase*		Task(s) No.	Rating on the importance of the knowledge**	Where do the people locate?			Communication Channel(s)								
		Level 1	Level 2			Within Your Dept.	Outside Your Dept.		Face to Face	Telephone	Meeting	Email	Fax	Chatroom	Others + (Please specify):	Others + (Please specify):
							Other Dept.	External to CLP								
e.g.	Chris Chan	Power failures	On detection of an unexpected cause of power failures	P7	2	√			√	√				√		
1.																
2.																
3.																
4.																
5.																
6.																
7.																
8.																
9.																
10.																
11.																
12.																

* See Appendix I (Practical Hints for Describing Tacit Knowledge).

** Rating on the importance of the knowledge: 1 – Not important ; 2 - Least Important ; 3 – Somewhat important ; 4 – Important ; 5 – Very important.

Remark: Please list the people who you usually consult for advice on technical knowledge and describe the knowledge requested in a key phrase. Please then state the task of the process in which you will contact the people and give rating on the importance of the knowledge. Please also state where the people locate as well as the communication channel(s).

STOCKS Forms – Industrial Technologies

Participant: _____

Process: _____

List of Industrial Technology

Existing industrial technology that is currently available in PSBG/CLP				
Existing industrial technology (To be provided by KR team)		Rating (To be filled in by SKILL™ workshop participants)		
		Ease to learn*	Time to learn**	Importance***
e.g.	Cable joining technology	4	3	5
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.	**Others** :			
12.	**Others** :			
13.	**Others** :			
14.	**Others** :			
Desirable industrial technology that is not currently available (to be acquired/developed in PSBG)				
e.g.	RFID			
1.				
2.				
3.				

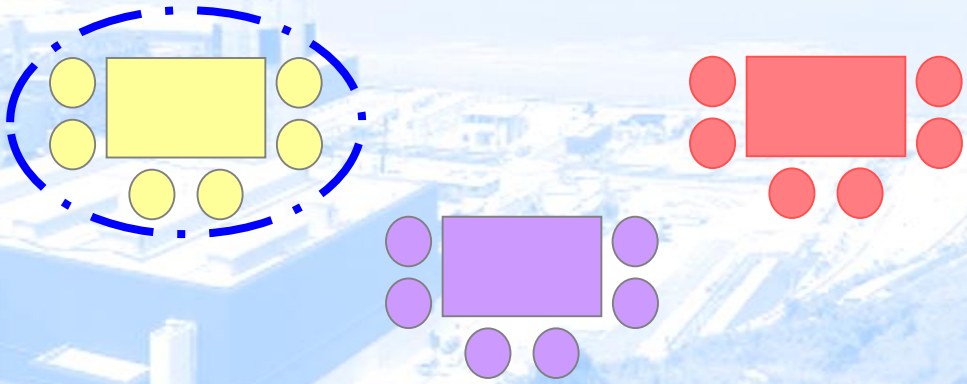
* Rating on the ease to learn the technology: **1** – Very difficult ; **2** – Somewhat difficult ; **3** – About right ; **4** – Relatively easy ; **5** – Easy

** Rating on the time to learn the technology: **1** – Short time ; **2** – Relatively short time ; **3** – About right ; **4** – Long time ; **5** – Very long time

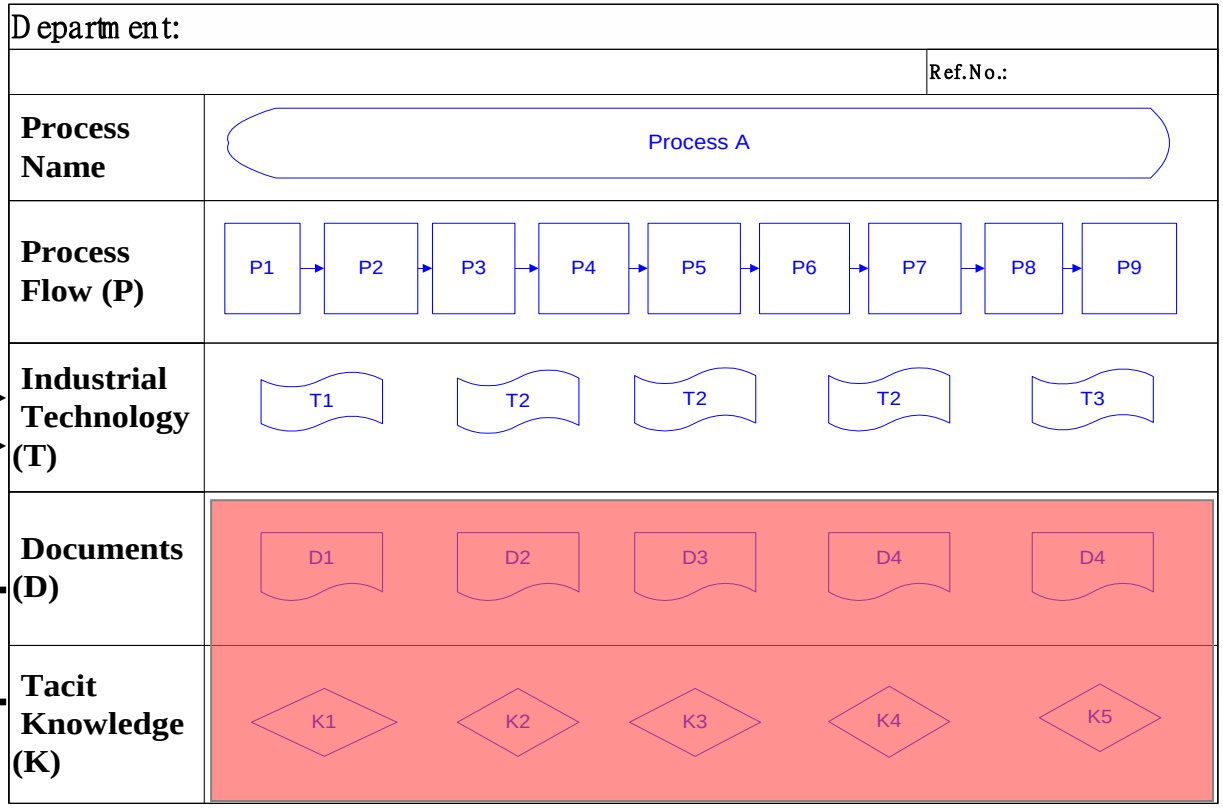
*** Rating on the importance of the technology: **1** – Not important ; **2** - Least important; **3** – Somewhat important ; **4** – Important ; **5** – Very important

Phase 3 – Workflow Study & STOCKS Workshop

- Around 30 staff participates in each STOCKS workshop
- Participants working on the same business process are clustered into one group
- Participants should come from different levels who work on the same process



- **Results are charted in a STOCKS Schema**
  - Validation of inputs from STOCKS Forms



Relate & map the documents & tacit knowledge with the industrial technology

Controlled vocabulary & thesaurus

Taxonomy (grouping of documents & tacit knowledge)

Phase 3 – Workflow Study & STOCKS Workshop

Before the Workshop

After the Workshop

Phase 4 – Knowledge Inventory

- Generate Explicit & Tacit knowledge Inventories after identifying the knowledge assets of the selected critical processes
- Knowledge profile of major knowledge sources and the types of user groups to which the knowledge is transferred are determined

Explicit Knowledge Inventory (AMD) - All

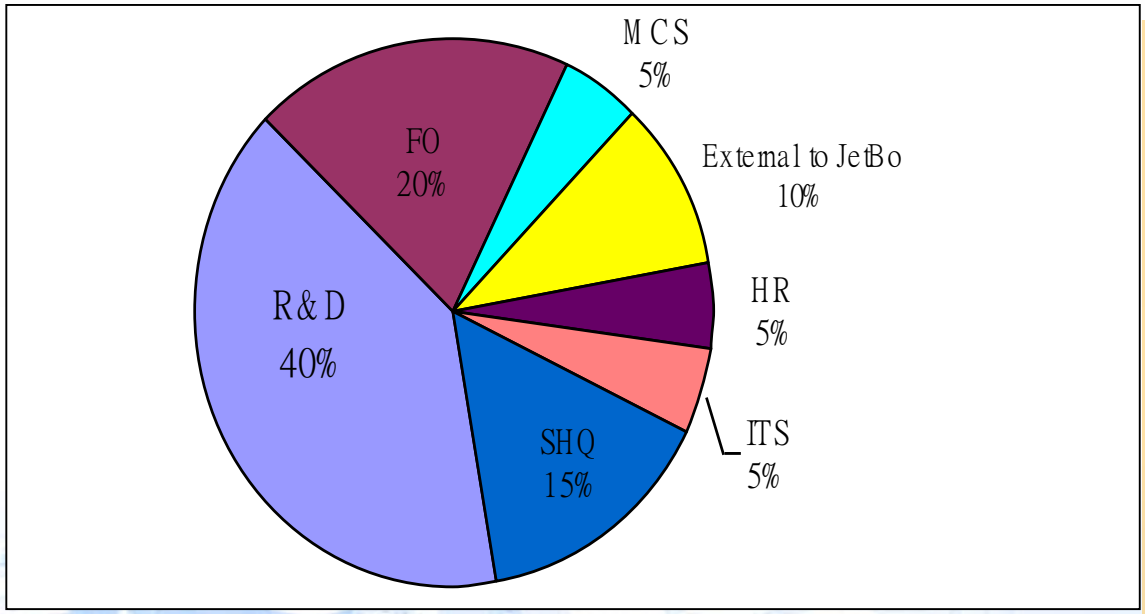
	Document Name	Process(s)		Task(s)		Document Format	Where From: People	Where From: IT Tools / Platforms	Major Users	Ease of obtaining	Ease of uploading	Importance	Average score of importance	Average score of ease of obtaining	Average score of ease of uploading	Remarks
1	Company's COP, Policy	1	Develop & maintain standards (AD)	P1	Review assist. mission for standards' policy changes	Printed, PDF	AMD	Intranet	KC Chang	5	-	5	5.00	5.00	-	-
				P2	Set up task/forces to review/ update/ develop standards											
				P3	Evaluate and finalize new/ modified standards											
2	HK Law, Government Regulation, Government COP	1	Develop & maintain standards (AD)	P1	Review assist. mission for standards' policy changes	Printed, PDF	External parties	Internet	KC Chang	5	-	5	5.00	5.00	-	-
				P2	Set up task/forces to review/ update/ develop standards											
				P3	Evaluate and finalize new/ modified standards											
3	Installation Manual	1	Develop & maintain standards (AD)	P1	Review assist. mission for standards' policy changes	PDF	AMD, External parties	AMD/ O&M web (Intranet)	CY Ip	5	-	5	5.00	5.00	-	-
4	Project Report	1	Preventive Maintenance optimization (AU)	P1	Introduction of new equipment	MS, PDF	AMD, Supplier, Region TLs	E-mail, Shared network drive, Internet, Intranet, SAP-EFMS/ EWMS	KP Lu	5	-	5	5.00	5.00	5.00	-
				P4	Define fault/ major deficiency on equipment											
				P7	Investment ranking assessment											
				P10	Define project detail											
				P11	Implementation of project & Update Assist Plan											
				P1	Introduction of new equipment	MS	KP Lu		Joe Tang (AMD)	-	5	5				
				P4	Define fault/ major deficiency on equipment											
				P7	Investment ranking assessment											
				P10	Define project detail											

Phase 5 – Analysis

Analysis Results

- Stakeholder Analysis
- Distribution of Knowledge in Tasks
- Critical Knowledge Worker
- Critical Industrial Technologies
- Mapping of knowledge with business processes and Industry technology
- Critical Tacit Knowledge
- Distribution of Explicit Knowledge
  - Knowledge Categorization
    (i.e. Critical, Focus, Abundant, Normal, Common, Working, Popular)

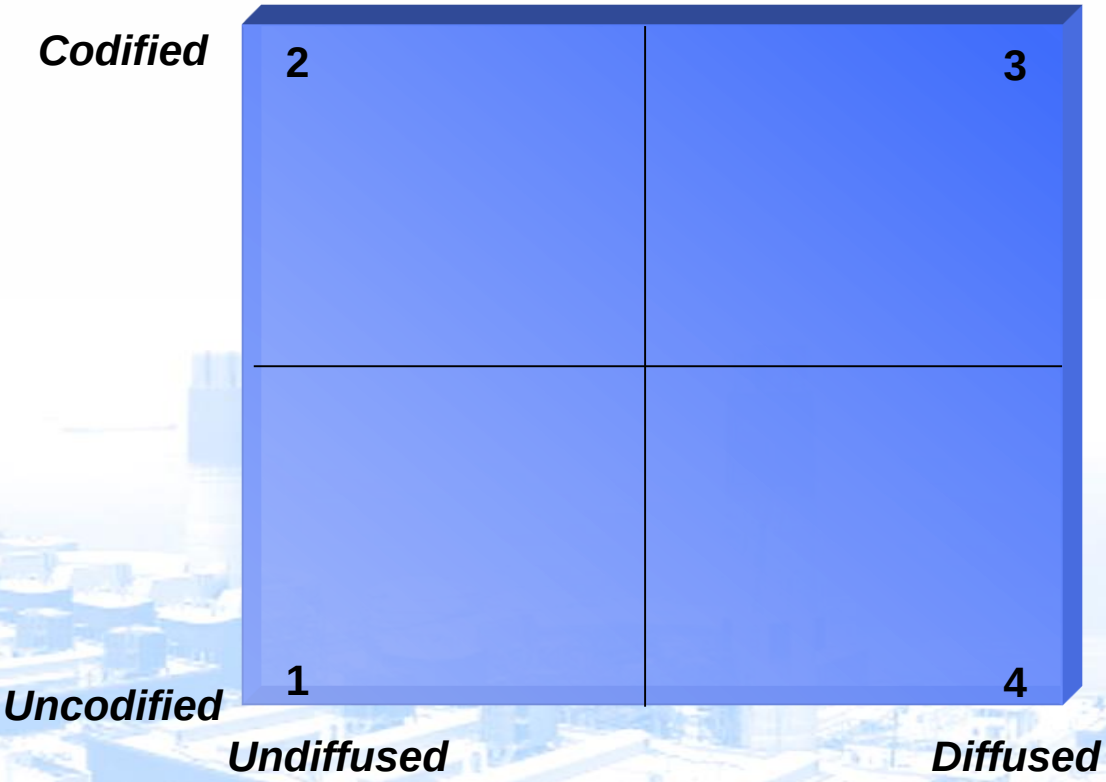
Stakeholder Analysis



The small stakeholders group may result in low knowledge throughput (limited knowledge sharing). The major stakeholders groups in these three processes are within PSBG. It can minimize the risk of knowledge leakage.

- Totally 60% of stakeholders are outside R&D team, these groups of people come from 6 different business teams/departments.
- Beside R&D, FO(20%), SHQ(15%) and External to PSBG (10%) are three key stakeholders in the R&D Process
- 10% of stakeholders are outside PSBG. These stakeholders are mainly the suppliers of the raw materials.

Distribution of Knowledge in Tasks



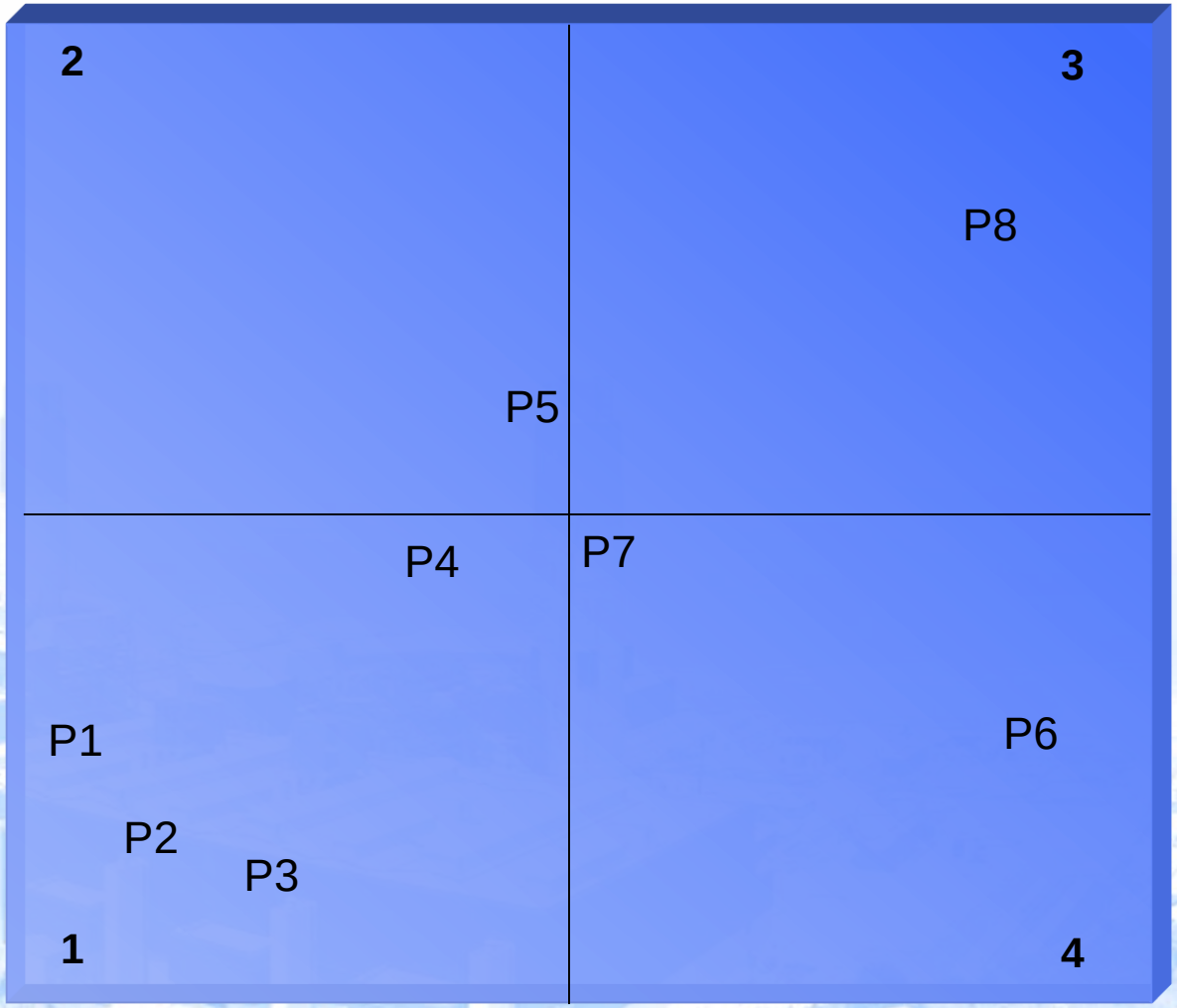
The distribution of knowledge is initially assigned according to the ratio of identified explicit to tacit knowledge items and the number of knowledge worker involved in knowledge sharing.

Distribution of Knowledge within the Tasks

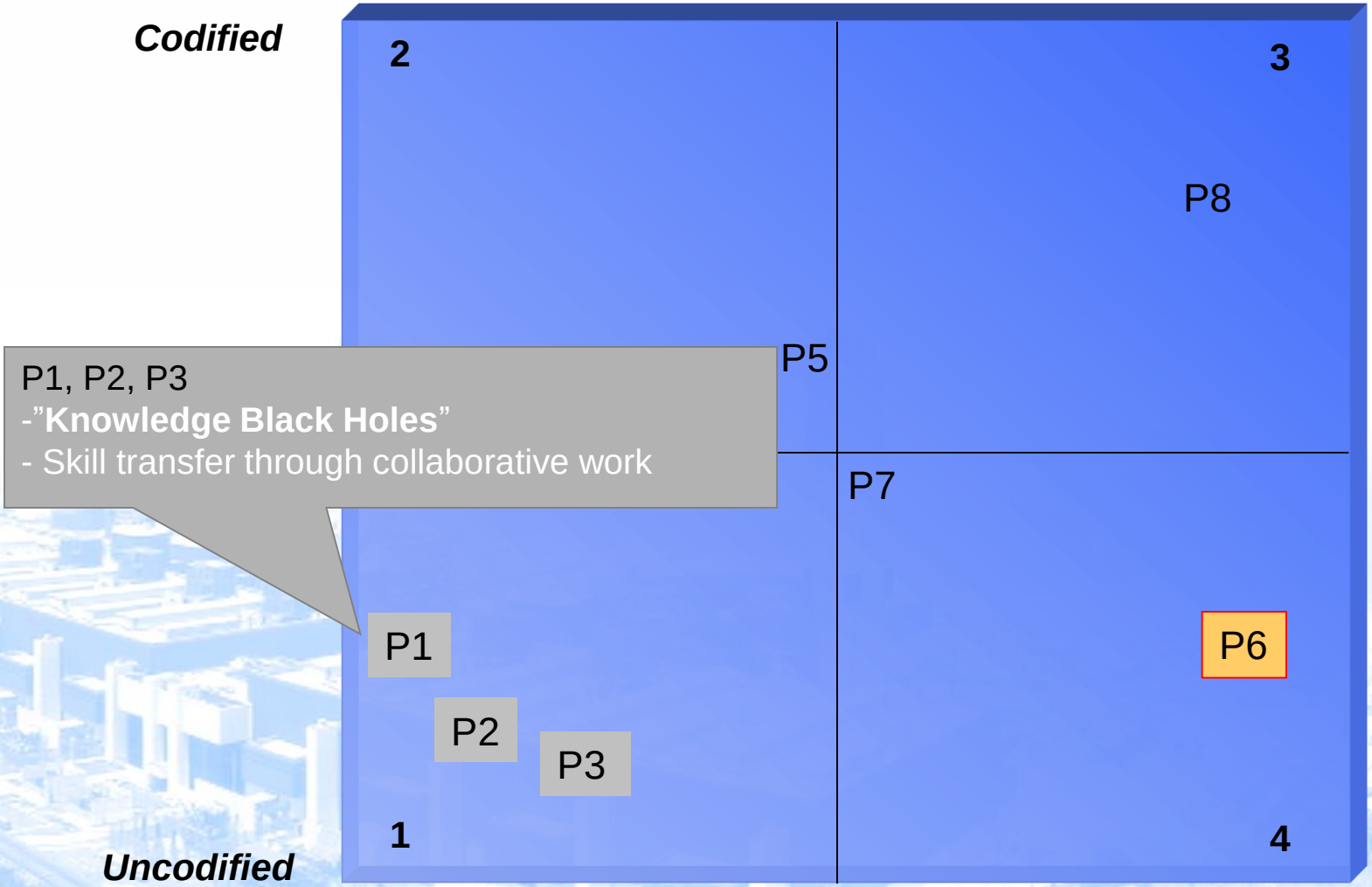
	No of Tacit Knowledge Items				No of Explicit Knowledge Items					
Task No.	Total	Self-own*	Shared Knowledge	No. of K-Worker(s)**	Total	Common	Critical	Abundant	Normal	Focus
P1	1	1	0	0	1	1	0	0	0	0
P2	1	1	0	0	2	1	0	0	0	1
P3	0	0	0	0	3	1	0	0	0	2
P4	3	1	2	2	2	1	0	0	0	1
P5	4	0	4	3	10	1	2	1	3	3
P6	0	0	5	2	6	1	0	0	1	0
P7	3	1	2	7	3	1	0	0	2	0
P8	4	0	1	7	7	4	0	0	2	1
P9	9	2	7	12	4	0	0	0	3	1
P10	5	0	0	4	6	1	1	0	2	2

* Self-own is interpreted as that knowledge has not been shared by anyone but for personal use only
** No. of knowledge worker involved in that shared knowledge except the self-own

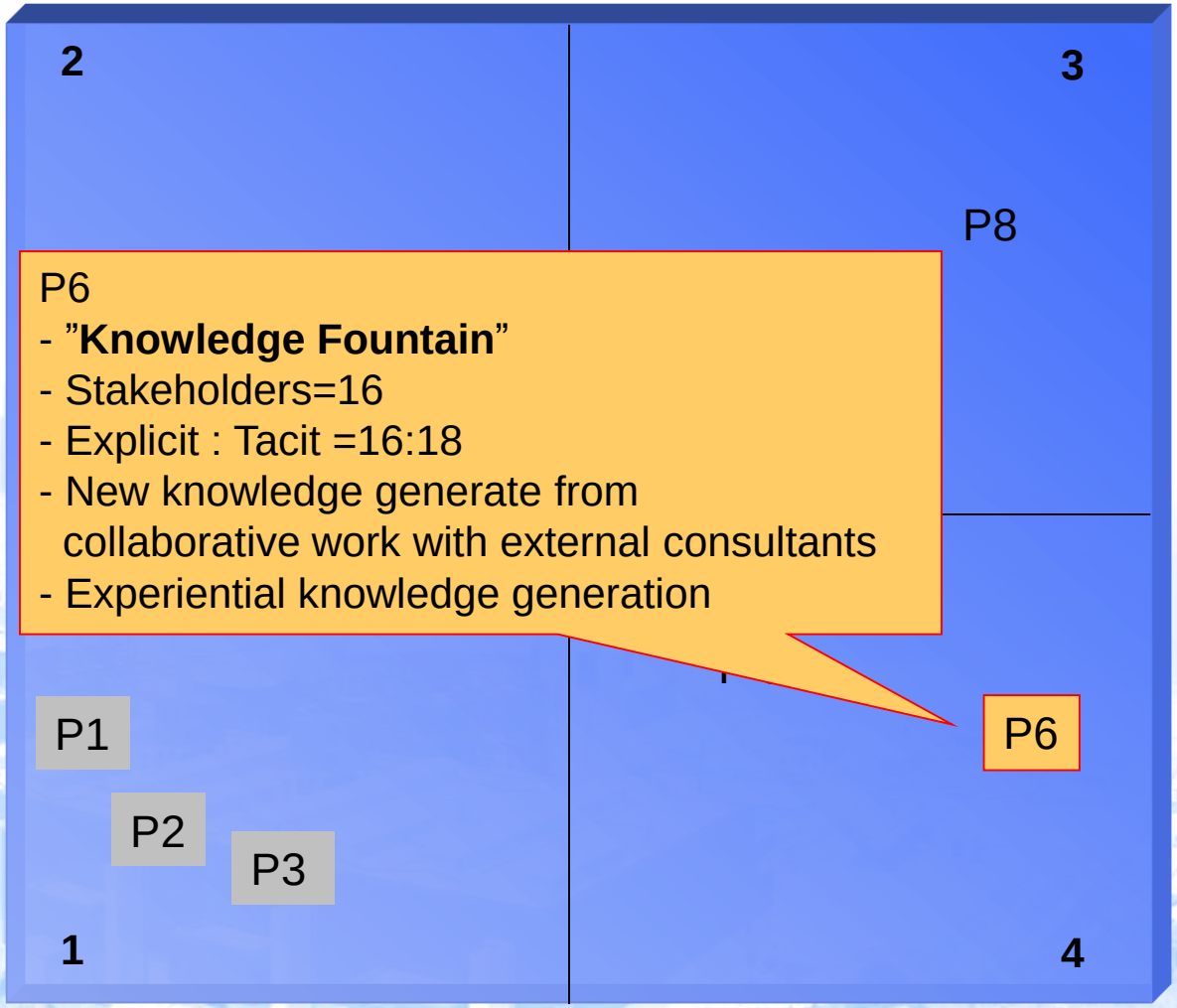
Distribution of Knowledge in Tasks



Distribution of Knowledge in Tasks

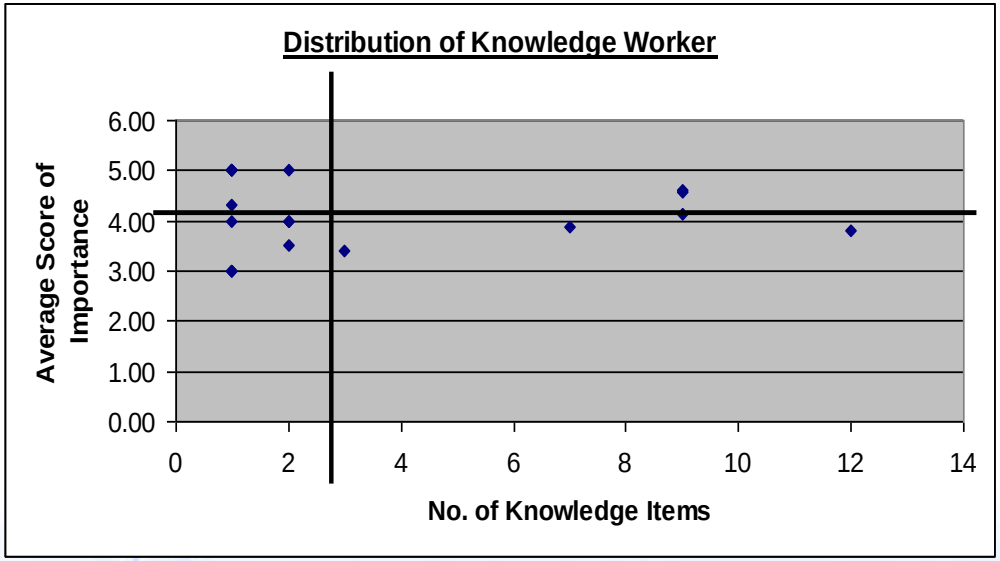


Distribution of Knowledge in Tasks



Critical Knowledge Workers

Department	Knowledge Worker	No. of K Items	Average Score
R&D	Jacky Wong	6	4.82
R&D	TW Chan	4	4.50
R&D	YT Lau	5	4.30
APF	John Lam	9	5.00
APF	Aaron Tam	9	4.17
SHQ	Ada Li	6	4.38
External to PSBG	Jason Smith	2	4.67



- To encourage the sharing of knowledge through linking people with people, an expertise directory is developed for critical knowledge workers.
- John Lam is the most critical worker in the R&D process with the highest no. and score of knowledge items identified .

Distribution of Explicit Knowledge

Classification	Document Name	No. of Users	Average score of importance
Common	Mold Standard	**109**	**4.86**
Common	Policy Paper	**107**	**4.67**
Common	Code of Practice	**62**	**4.92**
Common	Development Plan	**35**	**3.23**
Critical	System Parameters	**28**	**4.89**
Critical	Production Plan	**16**	**4.63**
Critical	Mold Design Diagram	**15**	**4.80**
Focus	Product Design Diagram	**6**	**4.33**
Focus	Demand Forecast	**8**	**4.50**
Focus	**Market Analysis**	**1**	**5.00**
Abundant	**Contracts**	**5**	**4.4**
Abundant	**Product Specifications**	**5**	**3.80**
Normal	System Manual	**5**	**4.00**
Normal	Operation Report	**7**	**3.57**

Remarks:

	No of Users	Average score of Importance
Common	Many	Mid-High
Critical	Mid-Many	High
Abundant	Mid	Low
Normal	Mid	Mid
Focus	Few	High

Critical Tacit Knowledge

Common Knowledge	No. of Knowledge Users	Average Score of Importance	No. of related Critical Technologies Related
System Characteristics (Familiarity of system characteristics & identify system weakness)	8	4.95	1
Molding Technology (Mold design)	8	4.50	2
Average	6	4.22	0.96

With a large number of knowledge customers, the above two knowledge areas are the most valuable areas to do knowledge capturing, using a variety of KM tools, such as narrative interview.

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Interviews & Validations

- Data Validation
- Comment on the use of knowledge and knowledge need for the business processes

Conclusion

Advantages of STOCKS Approach:

- An effective way to collect a large amount of information from respondents from different levels of the organization
- Larger scale when compared with interviews, which only cover limited sample size of participants
- Reduce the number of interviews required
- Collective thinking and learning
- Generate innovative opinions/ideas through interactive face-to-face discussion
- Encourage a better understanding of different business operation of the organization during face-to-face discussion and interaction

Q & A Session

Thank You for Your Attention!