CHAPTER III

SYSTEM PLANNING AND ANALYSIS

This chapter will describe the first 2 phases of System Development Life Cycle – planning and analysis – to be used as raw material for design specification creation.

In the planning phase, information of the company is gathered for defining the current position. And for the analysis phase, the analyst will illustrate current processes of the valuation company in the format of standard diagrams – UML and IDEFØ.

3.1 System Planning

The system analyst first gather details of company by reviewing the proposal and analysing internal and external factors to define the company's current position, vision, mission, and objectives. Then, he moves to analyse the IT needs of the company, internal and external factors that affect the IT requirements. Then, the system requests from all departments are collected and prioritised. The preliminary investigation provides steps of system planning and some checklists to follow to create a complete system plan.

3.1.1 Company current position

In order to know the company's current position, it is required to know both internal and external factors. SWOT analysis can help defining strengths, weaknesses, opportunities, and threats that company is currently dealing with. Vision, Mission can also illustrate objectives, roles, and goals of the company.

3.1.1.1 SWOT Analysis

The process of system planning starts from defining current position of the company and indicating strengths, weaknesses of current processes and external factors that the company currently face.

Table 3.1: SWOT Analysis of the Valuation Company

Strengths	Weaknesses
• Approved as a member of VAT. • Increasing number of jobs received. • Increasing number of contracted clients. • Good cooperation between departments. • Joined with international valuation company => Growth market segment to international.	• Manual processes / Paper-based work. • Duplicate / unnecessary processes. • Data inconsistency / redundancy. • Good cooperation but not so good information sharing. • No status tracking.
Opportunities	**Threats**
• Good brand image – gaining 'trust' from clients since the business started. • Increasing investment in real-estate. • Growing of banking business.	• Increasing number of Valuation Companies. • Economic crisis. • Government policy; increase tax of property. • Political issues.

3.1.1.2 Vision and Mission of the company

Vision, mission, and motto of the valuation company are shown as below.

- **Vision**

The Valuation Company's vision is to be a premium valuation services provider based on regulations for standard and ethics of valuers.

- **Mission Statement**

The Valuation Company's mission is to perform professional valuation services for trustworthy values of client's property.

- **Motto of this year [2009]**

"Quick response, Trustworthy, Accuracy and Good service mind"

3.1.2 IT needs

After knowing the company's current position, the analyst determines the IT needs of the company by considering 'reasons for system projects checklist' to define advantages to be gained from the IT implementation.

Then, he analyses internal and external factors that affect on projects to identify what are likely to be barriers and whom he should ask help from.

3.1.2.1 Reasons for Systems Projects

This checklist will let analyst know the objectives and requirements.

- **Improved services [✓]**

  The company needs a Database, Graphic User Interfaces (GUIs) and automatic workflow for improved a valuation process and allow tracking system for increasing service level when they deal with clients.

- **Better performance [✓]**

  The company needs an Information System to transform legacy manual processes to computer-based processes which can eliminate unnecessary processes and reduce redundancy / inconsistency of data. The Information System also allows the executives to grab the overall of their business, and a customised report for improving their performance.

- **More information [✓]**

  A lot of data in current processes cannot be transformed into useful information because of manual processes. An Information System is needed to centralise data and manage the authorisation of data access.

- **Stronger control [✗]**

  Though IS will centralise data and allow executives to get an overall for better strategic planning. They do not need stronger control.

- **Reduce cost [✗]**

  Cost reduction can be considered as a by-product from improving work performance rather than concentrating only how to spend less money.

3.1.2.2 Internal Factors of IT acquisition

- **Strategic plan [✓]**

  The company sets strategies to support more clients with professional valuation services, so an efficient workflow is needed. They decided to acquire IT solutions for supporting workflow management which eliminates unnecessary tasks and allow them to access the required information.

- **Top managers [✓]**

  This company is quite centralised. Almost all important requests must be approved by the Managing Director before starting projects. He himself requested IT solutions. They also inform all staff to share required resources and system requirements to the IT officer. So it can be said that the project is well supported by the executives.

- **User requests [✓]**

  Besides being ordered by executives, staff also need a new system to improve their work. Staff are willing to share their work processes and information including explaining to IT staff about their requirements.

- **Information Technology department [✗]**

  The company has an in-house IT department. They fully understand the company structure and culture. They can respond suitably to users.

- **Existing system [✗]**

  The company does not have an existing Information System.

3.1.2.3 External Factors of IT acquisition

- **Technology [✗]**

  Although technology changes rapidly, the valuation business is not allocated in a technology-based sector. They just need a system that provides suitable solutions for supporting their work. They also want stable and easy-to-customise technology rather than unfamiliar latest technology.

- **Suppliers [✗]**

  The system requests do not contain processes that communicate with suppliers. So suppliers will not affect on the system development.

- **Clients [✗]**

  The Information System is developed to support only internal processes of the company. After finishing the IT implementation, clients may feel that the services level which the company provides for them is increased.

- **Competitors [✓]**

  Many competitors have already implemented IT solutions. It is the major point to acquire IT for gaining competitive advantages.

- **The economy** [✓]

  The current economic situation is in crisis. So the IT solutions must be executed by spending a budget as effective as possible.

- **Government** [✗]

  Information System development is legal.

3.1.2.4 Evaluation of Systems Requests

From the reasons for system projects and factors, it can be summarised into the main points of problems that needed to be fixed as shown below.

- **Data inconsistency and Redundancy** [URGENT]

  In current work, staff focus only on their own task. They create specific documents and forms to use among their groups. Some general data such as properties' detail cannot be shared because it contains some confidential parts for specific departments. General data is inputted repeatedly into different documents. Input errors always occur and cause data inconsistency. Some similar data is used in different formats which is redundant. The system needs to provide features that can manage data effectively and allow data flows among the system in a unique format.

- **Manual / Duplicate process** [URGENT]

  Because current processes focus only on paper-based work, employees do not know much about other work. Many processes produce the same output as other departments' which are duplicate processes. The system needs to provide features that can automate workflow, eliminate duplicate processes, and replace paper-based processes to computer-based processes that allow staff to access required data efficiently.

- **No tracking systems** [URGENT]

  Paper-based work not only causes that staff are unable to do planning, but also decreases service levels when clients ask for their jobs' progress.

- **Lack of information sharing** [NORMAL]

  This problem is set to 'normal' because as soon as the information system is developed to fix urgent problems. Information will be shared in the system. Solution of this issue is a by-product of fixing urgent problems.

- **No workflow system** [NORMAL]

  Like 'lack of information sharing', this problem is set to 'normal' because as soon as the system is developed to fix 3 'urgent' problems. The processes will be rearranged and continuously built as workflow. The solution of this issue is by-product of fixing the urgent problems.

3.1.3 Preliminary Investigation

Preliminary investigation provides 5 steps of work to develop a project plan.

3.1.3.1 Step 1: Understand the problems or opportunities

Table 3.2: Statement of Problems from chapter 1 – Introduction

1. Improper processes – duplicate, unnecessary tasks, etc. – in valuation flow makes the company difficult to improve work efficiency
2. Lack of requirements to design Information System which makes the company currently facing many problems;
    d. Difficult to track status of each job.
    e. Information sharing is blocked, so it increases paper usage.
    f. Lack of information sharing prohibits people from seeing big picture of the company. It is difficult for each department to plan for their work;

The statement of problems from chapter 1 combined with system requests allow the analyst to indicate causes and effects as the fishbone diagram below.

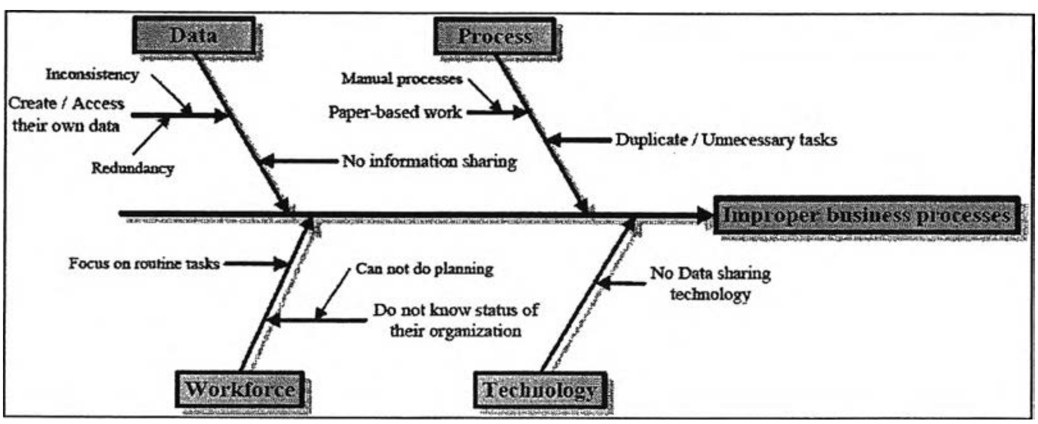


Figure 3.1: Fishbone diagram of current processes of the Valuation Company

3.1.3.2 Step 2: Define the project scope and constrains

The project will run until the software is delivered. However, this research will cover only business processes improvement. So the scope must be divided into the scope of the overall project and the scope that this research will cover.

- **Scope and Constraints of the Project**
  - This project will improve only the valuation process – core process that start from receiving detail of jobs to delivering the report.
  - The project will NOT cover accounting, marketing, human resources, support and management tasks that are not related to the core process.
  - The output of project is an application that allow
    - Information sharing
    - Transform inefficient manual works to computer-based processes.
    - Eliminate unnecessary processes
    - Eliminate data inconsistency and redundancy
    - Implement workflow management system
    - Allow all staff to access required data for planning

- **Scope and Constrains of the Research**
  - The research will cover only business processes improvement of the core processes of the company – valuation process.
  - The research will present the business processes by using standard 'diagrams' such as UML and IDEF which are usable in design and development phase in SDLC.
  - The research will cover some sample program functions that developed follow the improved diagrams.
  - This research will hide all names for privacy.
  - The research will cover these following standard diagrams.
    - IDEFØ
    - Use Case Diagram
    - Data Flow Diagram [DFD]
    - Activity Diagram
    - Sequence Diagram
    - State Chart Diagram
  - The research will NOT cover these following standard diagrams such as ER Diagram, Data Dictionary, Prototype, Programming Code, etc.

3.1.3.3 Step 3: Perform fact-finding

Fact-finding is performed to gather the company's characteristics which are important resources for design. The method starts from considering an organisation chart to understand company's infrastructure, interview users for actual tasks and weak points of the current processes, defining communications among departments, and studying internal documents to collect data patterns.

- **Organisation and position chart**

The organisation and position chart can illustrate the company's structure that assists the IT team to know that they can acquire specific part of information from where, and ask for permission from whom.

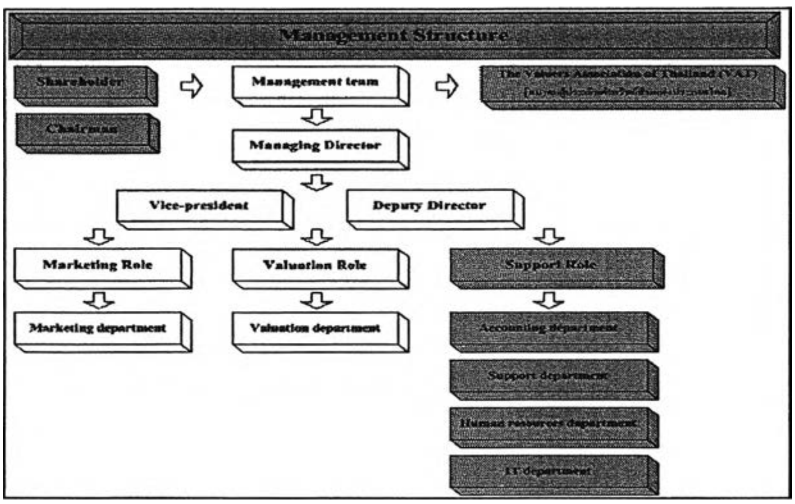


Figure 3.2: Valuation Management Structure
(Company server, 2008)

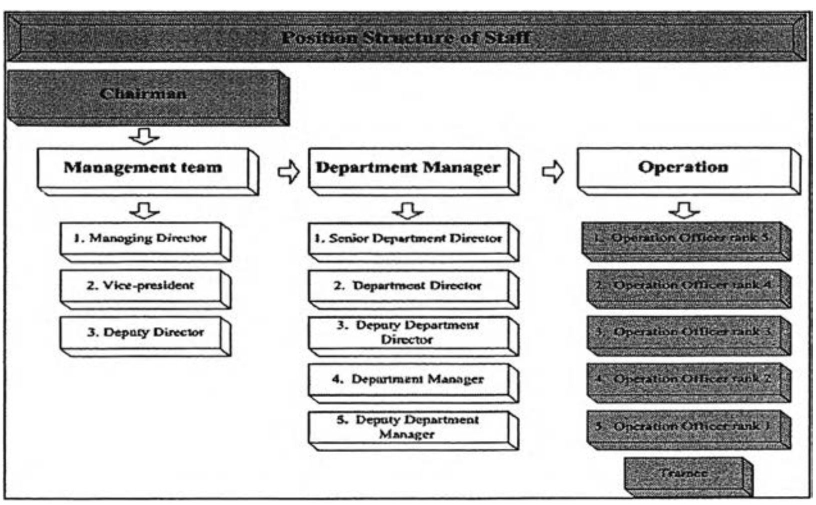


Figure 3.3: Valuation Position Structure of staff
(Company server, 2008)

- **Interview**

Interviewing is a useful technique to reveal actual responsibilities, and some dissatisfaction of staff in their current work. The result will describe the weak points of their current work that will motivate them to improve.

- Marketing Department

Table 3.3: Role and Weaknesses of Marketing Department

Roles	Weak points
✓ Receive jobs from clients ✓ Calculate service cost ✓ Create / Send quotation to clients ✓ Create Job Order document ✓ Add job to Job List document ✓ Queue report submission	× Cannot response quickly when they ask for progressive because the tracking system is not available => **Clients' complaint** × Cannot control and plan for jobs receivable and expected income.

- Accounting Department:

Table 3.4: Role and Weaknesses of Accounting Department

Roles	Weak points
✓ Manage clients' payment ✓ Manage advanced budget	× Work hard with no planning

- Valuation Department:

Table 3.5: Role and Weaknesses of Valuation Department

Roles	Weak points
✓ Assigned to do jobs ✓ Study job detail ✓ Prepare to survey and Survey ✓ Create draft report ✓ Control standard of full report created by support ✓ Control approval processes	× Job owner, manage flow of paper manually which is not so efficient × Parallel work [handle many jobs at the same time] × Cannot focus on core responsibility – valuating asset

- Support Department:

Table 3.6: Role and Weaknesses of Support Department

Roles	Weak points
✓ Acquire draft report ✓ Acquire suitable report template ✓ Create / Edit full report	× Work hard without planning × Limited resources × Bottle neck

- Human Resources Department :

Table 3.7: Role and Weaknesses of Human Resources Department

Roles	Weak points
✓ Support all facilities ✓ Deliver report [messenger] ✓ Update Job Summary document for valuers' reference.	× Work hard with no planning × Almost all data in Job Summary document are already available. => redundant data / duplicate process

- Management:

Table 3.8: Role and Weaknesses of Management

Roles	Weak points
✓ Approve report ✓ Plan for improvement	× Not enough information × Hard to manage × **'Bottle neck'** in approval process

- **Cross-department communication**

Communications among departments is useful information especially for developing an information system to automate company workflow.

Table 3.9: Cross-department communication

Executives	Valuation
⇔ **ALL** o Explain overall company position, goals and strategies o Approve all requests ⇔ **Valuation** o Report approval process ⇔ **Marketing** o Report incoming jobs, late delivery jobs, and income. o Assign jobs to valuers	⇔ **Accounting** o Request / Approve advanced budget for valuation ⇔ **Marketing** o Get Job detail to prepare to survey o Track job status. o Deliver Final report for submission ⇔ **Support** Format draft report to full report
Marketing	**Human resources**
⇔ **Clients** o Receive jobs from clients , create jobs in system o Request for more detail of property o Report status of jobs to clients	⇔ **Valuation** o Borrow tools for valuation o Access Job summary report ⇔ **Marketing** o Queue jobs for submission and submit jobs

- **Internal document**

The company work mainly flows by specific documents that are listed in table 3.10 as below. From these documents, the analyst can identify in each step of work which data is used, generated and transformed to output.

Table 3.10: List of internal documents

- Draft work process (figure 3.4)
- Quotation (figure 3.5)
- Invoice (figure 3.6)
- Job order (figure 3.7)
- Job list (table 3.11)
- Advanced budget request form (figure 3.8)
- Valuation tools borrowing (table 3.12)
- WQS - Weighted Quality Score Table (table 3.13)
- Job summary (table 3.14)
- Job submission (figure 3.9)

- Draft work process:

This document presents an overview of company's process that allows new joiners or clients to easily understand how the company works.

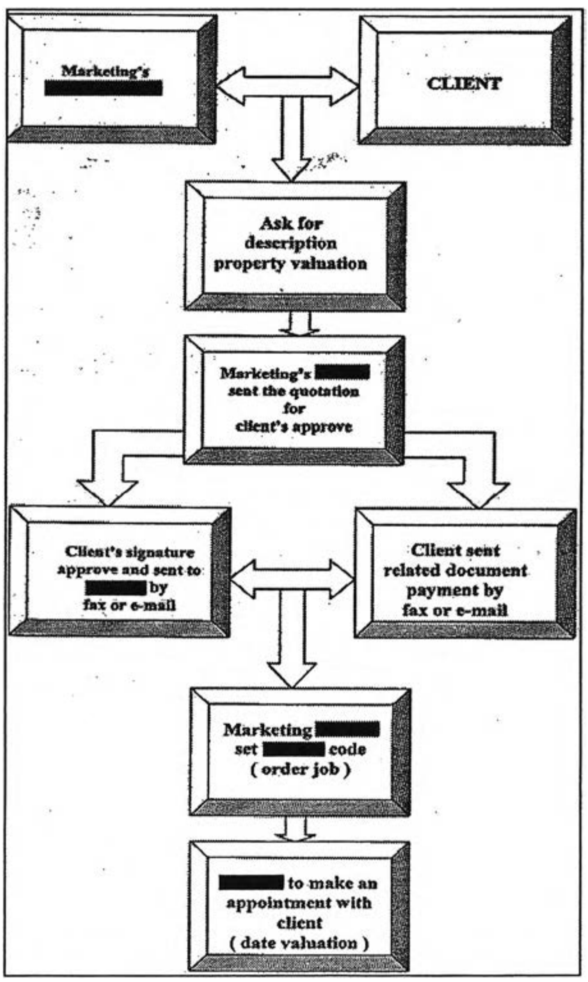


Figure 3.4: Work process of the Valuation Company
(Adapted from overview of work process, document server of management, 2008)

- Quotation:

The quotation contains general information of clients, properties, etc. It informs total expense ($\sum$ total services cost) for clients to consider whether they accept this cost and continue the appraisal process or not. If they agree, they will sign the quotation and send back to the company.

[redacted]

บริษัท [redacted] จำกัด

[redacted]

TEL. [redacted] FAX. [redacted] E-mail : [redacted]

เลขประจำตัวผู้เสียภาษี [redacted]

ใบเสนอราคา / QUOTATION

ชื่อผู้ว่าจ้าง/ผู้ติดต่อ : [redacted]

ที่อยู่บริษัท : [redacted]

เบอร์โทร/แฟกซ์ : [redacted]

เลขที่ : [redacted] / QT. 52-01-001

วันที่ : 6 มกราคม 2552

เรียน ท่านกรรมการผู้จัดการ

บริษัท [redacted] จำกัด

เรื่อง ขอเสนอค่าบริการงานสำรวจและประเมินมูลค่าทรัพย์สิน

ตามที่ท่านมีความประสงค์ให้ทางบริษัท [redacted] จำกัด เสนออัตราค่าบริการงานประเมินมูลค่าทรัพย์สิน บริษัทฯ ขอเรียนเสนอค่าบริการ ดังนี้

ลำดับ	รายละเอียดทรัพย์สิน	ค่าบริการ	VAT 7%	ค่าบริการรวม
1.	รายลูกค้า : [redacted] ที่ดินจำนวน 1 แปลง โฉนดเลขที่ [redacted] เนื้อที่ 9-0-10.0 ไร่ พร้อมอาคารโรงงาน จำนวน 1 หลัง ที่ตั้งทรัพย์สิน : ต. บ้านแลน อ. บางปะอิน จ. พระนครศรีอยุธยา	22,000.00	1,540.00	23,540.00
		รวมค่าบริการวิชาชีพทั้งสิ้น		23,540.00
		สองหมื่นสามพันห้าร้อยสี่สิบบาทถ้วน		

หนังสือคำสั่งจ้าง ที่ [redacted] / QT. 52-01-001

ข้าพเจ้าเข้าใจและยอมรับในเงื่อนไขหลักเกณฑ์ดังกล่าวข้างต้น เป็นอย่างดีและตกลงว่าจ้างหรืออนุมัติให้บริษัทดำเนินการได้

....

(..) ([redacted])

วันที่.. รองผู้จัดการฝ่ายการตลาด และประชาสัมพันธ์

กรุณาเซ็นต์อนุมัติให้ดำเนินการ แล้วส่งแฟ็กซ์กลับมาที่บริษัท และขอขอบพระคุณท่านมา ณ โอกาสนี้ด้วย

วิธีการชำระเงิน ชำระเป็นเงินสด, ชำระเป็นเช็ค หรือ โอนเงินเข้าบัญชีในนาม "บริษัท [redacted] จำกัด"

ธนาคาร [redacted] สาขา [redacted] บัญชีออมทรัพย์เลขที่ [redacted]

ธนาคาร [redacted] สาขา [redacted] บัญชีออมทรัพย์เลขที่ [redacted]

เงื่อนไข/หลักเกณฑ์

1. บริษัทใช้หลักเกณฑ์การประเมินมูลค่าตลาดของทรัพย์สิน โดยใช้ *วิธีคิดจากต้นทุน* เป็นการประเมินมูลค่าทรัพย์สิน
2. วัตถุประสงค์เพื่อทราบมูลค่าตลาดปัจจุบัน ประกอบการขอสินเชื่อกับ *ธนาคาร* [redacted] *จำกัด (มหาชน)*
3. บริษัทจะจัดส่งรายงานการประเมินมูลค่าทรัพย์สินดังกล่าวให้ธนาคาร จำนวน 1 เล่มรายงานเป็นรายงานภาษาไทย โดยกำหนดส่งมอบให้ท่านภายใน 7-10 วันทำการ นับจากวันที่บริษัทฯ ได้รับชำระค่าบริการ และเอกสารประกอบการประเมินครบถ้วน
4. ชำระค่าบริการ 100% ณ ก่อนวันออกสำรวจ
5. บริษัทจะยึดถือคำสั่งจ้างจากท่านเป็นลายลักษณ์อักษรเป็นหลัก และใบเสนอราคานี้มีระยะเวลา 15 วัน
6. กรณี ณ วันสำรวจหากพบว่ามีรายละเอียดสิ่งปลูกสร้างหรือเครื่องจักรเพิ่มเติม ทางบริษัทฯ จะขอเก็บค่าบริการเพิ่มในภายหลัง

Figure 3.5: Quotation document
(Adapted from Quotation, document server of marketing, 2008)

- Invoice:

The invoice will be used as payment evidence when clients agree with services cost and let the company do the appraisal. The invoice document contains general information of clients, job ID and total expense.

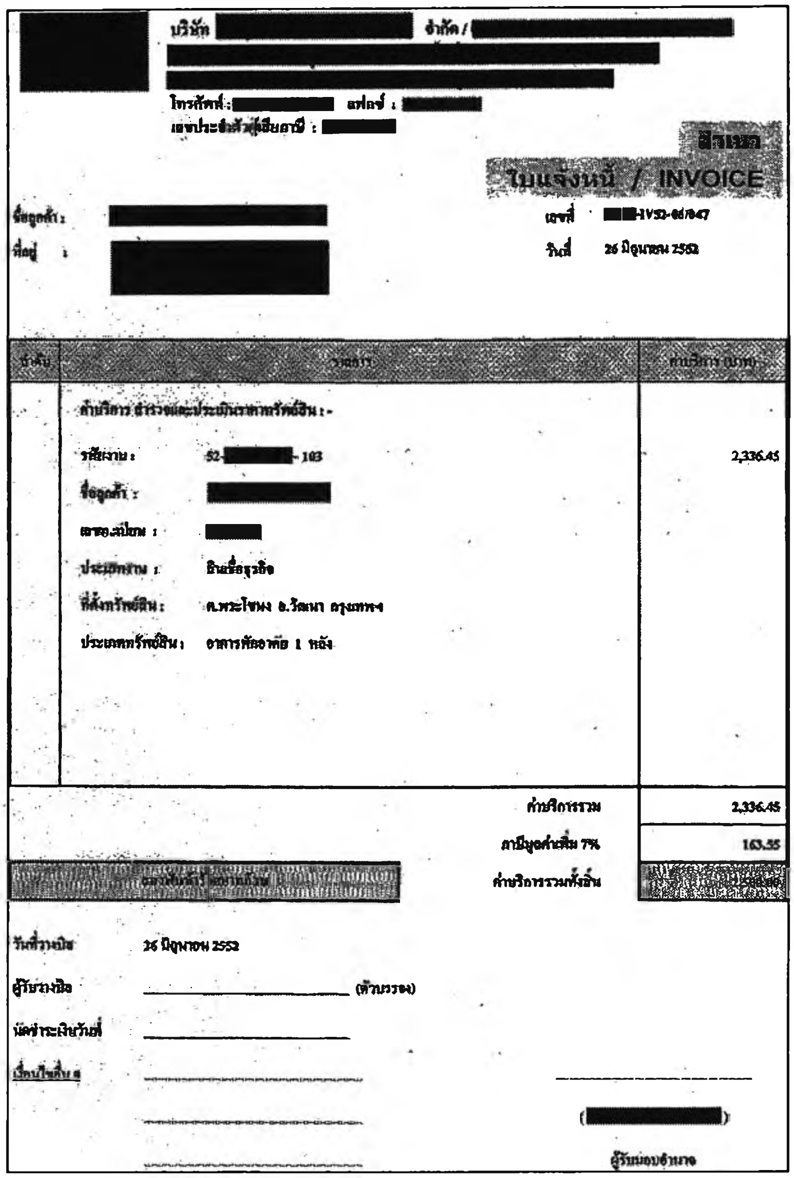
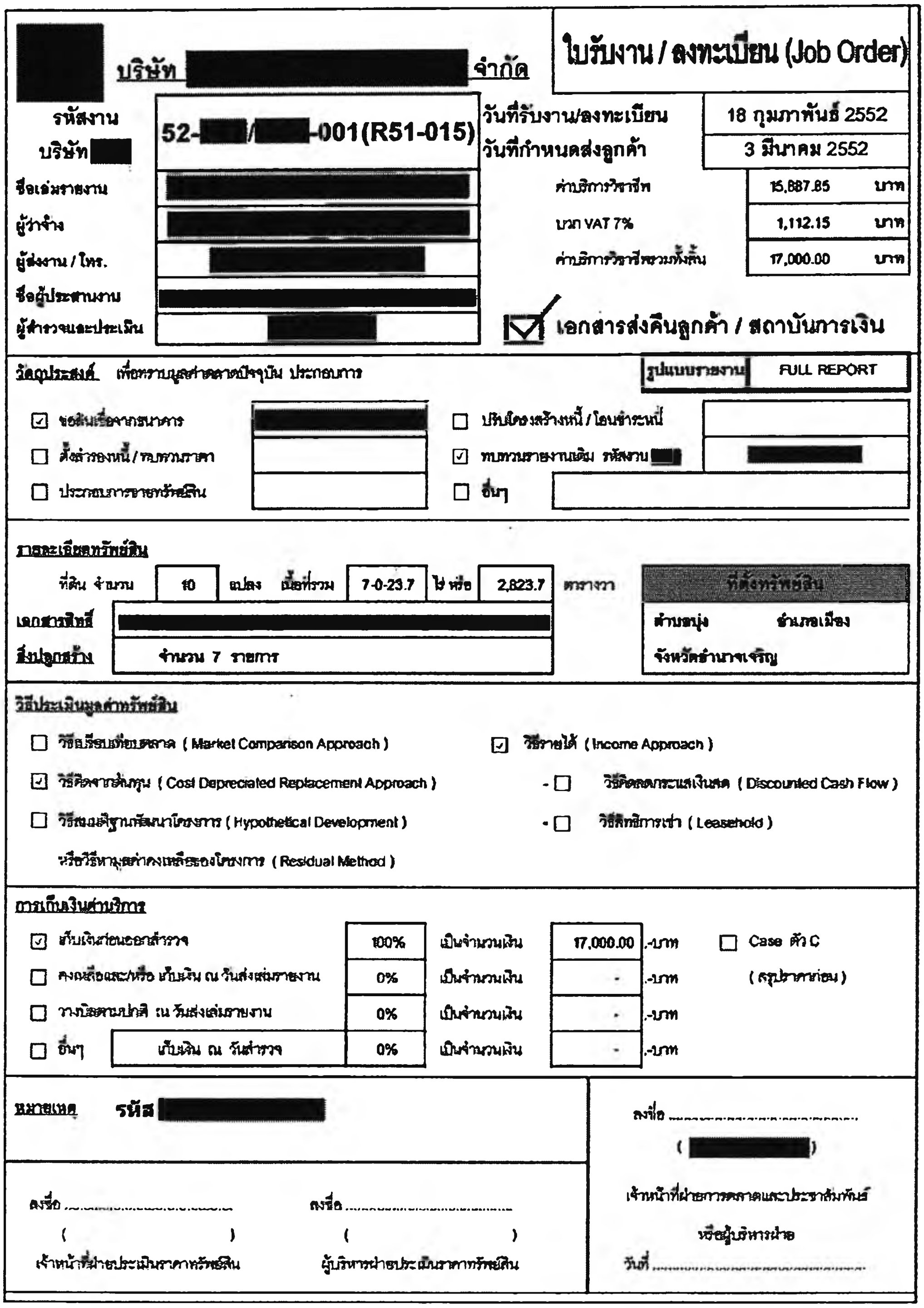


Figure 3.6: Invoice document
(Adapted from Invoice, document server of accounting, 2008)

- Job order:

A Job Order is created by the marketing department which provides complete information of jobs that required using when valuers survey such as contact information, properties, title deed, valuation approach, etc.



[redacted] บริษัท [redacted] จำกัด

ใบรับงาน / ลงทะเบียน (Job Order)

รหัสงาน บริษัท [redacted]	52-[redacted]/[redacted]-001(R51-015)	วันที่รับงาน/ลงทะเบียน	18 กุมภาพันธ์ 2552
		วันที่กำหนดส่งลูกค้า	3 มีนาคม 2552
ชื่อเล่มรายงาน	[redacted]	ค่าบริการวิชาชีพ	15,887.85 บาท
ผู้ว่าจ้าง	[redacted]	บวก VAT 7%	1,112.15 บาท
ผู้ส่งงาน / โทร.	[redacted]	ค่าบริการวิชาชีพรวมทั้งสิ้น	17,000.00 บาท
ชื่อผู้ประสานงาน	[redacted]		
ผู้สำรวจและประเมิน	[redacted]	☑ เอกสารส่งคืนลูกค้า / สถาบันการเงิน	

วัตถุประสงค์ เพื่อทราบมูลค่าตลาดปัจจุบัน ประกอบการ — รูปแบบรายงาน: FULL REPORT

- ☑ ขอสินเชื่อจากธนาคาร [redacted]
- ☐ ตั้งสำรองหนี้ / ทบทวนราคา
- ☐ ประกอบการขายทรัพย์สิน
- ☐ ปรับโครงสร้างหนี้ / โอนชำระหนี้
- ☑ ทบทวนรายงานเดิม รหัสงาน [redacted]
- ☐ อื่นๆ

รายละเอียดทรัพย์สิน

ที่ดิน จำนวน 10 แปลง เนื้อที่รวม 7-0-23.7 ไร่ หรือ 2,823.7 ตารางวา

เอกสารสิทธิ์ [redacted]

สิ่งปลูกสร้าง จำนวน 7 รายการ

ที่ตั้งทรัพย์สิน: ตำบลบุ่ง อำเภอเมือง จังหวัดอำนาจเจริญ

วิธีประเมินมูลค่าทรัพย์สิน

- ☐ วิธีเปรียบเทียบตลาด (Market Comparison Approach)
- ☑ วิธีคิดจากต้นทุน (Cost Depreciated Replacement Approach)
- ☐ วิธีสมมติฐานการพัฒนาโครงการ (Hypothetical Development) หรือวิธีหามูลค่าคงเหลือของโครงการ (Residual Method)
- ☑ วิธีรายได้ (Income Approach)
  - ☐ วิธีคิดลดกระแสเงินสด (Discounted Cash Flow)
  - ☐ วิธีสิทธิการเช่า (Leasehold)

การเก็บเงินค่าบริการ

☑ เก็บเงินก่อนออกสำรวจ	100%	เป็นจำนวนเงิน	17,000.00	.-บาท
☐ คงเหลือและ/หรือ เก็บเงิน ณ วันส่งเล่มรายงาน	0%	เป็นจำนวนเงิน	-	.-บาท
☐ วางบิลตามปกติ ณ วันส่งเล่มรายงาน	0%	เป็นจำนวนเงิน	-	.-บาท
☐ อื่นๆ เก็บเงิน ณ วันสำรวจ	0%	เป็นจำนวนเงิน	-	.-บาท

☐ Case ตัว C (สรุปราคาก่อน)

หมายเหตุ รหัส [redacted]

ลงชื่อ .... ( ) เจ้าหน้าที่ฝ่ายประเมินราคาทรัพย์สิน

ลงชื่อ .... ( ) ผู้บริหารฝ่ายประเมินราคาทรัพย์สิน

ลงชื่อ .... ([redacted]) เจ้าหน้าที่ฝ่ายการตลาดและประชาสัมพันธ์ หรือผู้บริหารฝ่าย วันที่ ....

Figure 3.7: Job order document
(Adapted from Job order, document server of marketing, 2008)

- Job list:

A Job list document is another format of the Job order document. It is used only in the marketing department because it contains specific marketing information which is secret. The marketing department always work based on this document and report progress of jobs to executives.

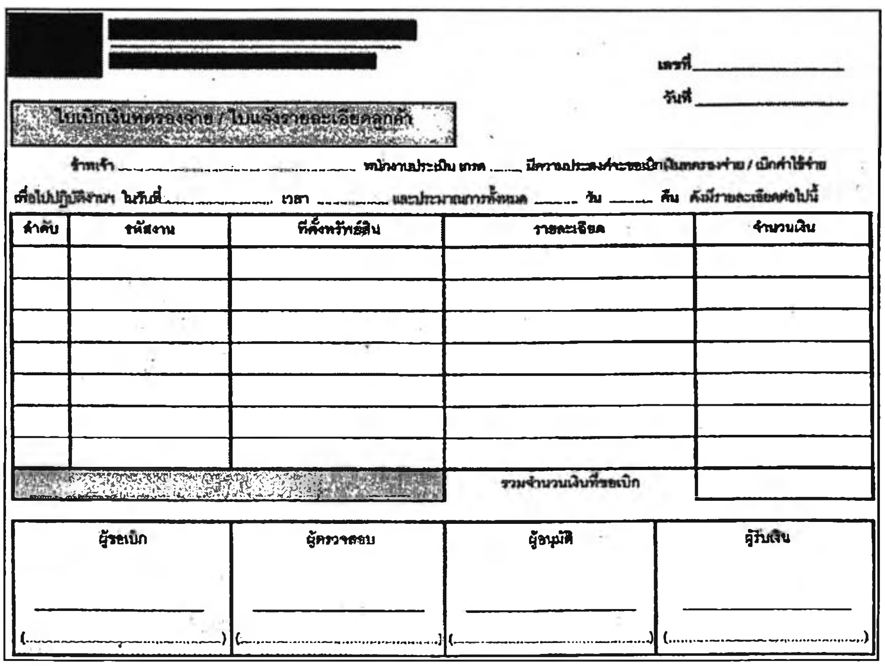
Table 3.11: Job list document [reverse axis]

Topic	Sample data	
ลำดับ	1	2
ชุดงาน	ม.ค 1	ม.ค 2
วันที่รับงาน	23-ธ.ค.	6-ม.ค.
รหัสงาน	52-[redacted]/[redacted]-001 (R51-120)	52-[redacted]/[redacted]-012 (R51-117)
รหัสทรัพย์/ ลูกหนี้	02-88-02860	01-88-06412
ชื่อลูกค้า	[redacted]	[redacted]
รายละเอียดทรัพย์สิน	ที่ดิน+สิ่งปลูกสร้าง จำนวน 2 รายการ	ที่ดินว่างเปล่า จำนวน 1 แปลง
ที่ตั้งทรัพย์สิน	ต.จันจว้า อ.แม่จัน จ.เชียงราย	ต.สันทราย อ.เมืองเชียงราย จ.เชียงราย
ผู้ประเมิน	[redacted]	[redacted]
ลายเซ็น		
กำหนดส่งงาน	22 ม.ค. 52	30 ม.ค. 52
ส่งงานจริง	15 ม.ค. 52	16 ม.ค. 52
ค่าบริการ 100%	6,100.00	6,100.00
ค่าเคส		
วางบิล	X	X
เลขที่ใบแจ้งหนี้	52-02/011	52-02/012
วันที่รับเงิน	6/2/52	6/2/52
[illegible]		X
[illegible]		[illegible]
[illegible]		[illegible]
วันที่ประเมิน	9 มกราคม 2552	9 มกราคม 2552
มูลค่าตลาด	373,000.00	362,000.00
มูลค่าบังคับขาย	223,800.00	131,000.00
วันจ่ายค่าเคส	15/2/52	15/2/52
ประเภทงาน		

(Adapted from Job list, document server of marketing, 2008)

- Advanced budget request form:

Every job requires a budget when the valuer prepares to survey. Cost of jobs usually includes travel and residence cost. This document is a standard form that the accounting department uses for managing budget for valuation. It contains cost history and statistics to summarise for executives.


[redacted]

เลขที่____________

วันที่____________

ใบเบิกเงินทดรองจ่าย / ใบแจ้งรายละเอียดลูกค้า

ข้าพเจ้า ____________ หน่วยงานประเมิน เขต ____ มีความประสงค์จะขอเบิกเงินทดรองจ่าย / เบิกค่าใช้จ่าย เพื่อไปปฏิบัติงานฯ ในวันที่____________ เวลา ________ และประมาณการทั้งหมด ____ วัน ____ คืน ดังมีรายละเอียดต่อไปนี้

ลำดับ	รหัสงาน	ที่ตั้งทรัพย์สิน	รายละเอียด	จำนวนเงิน
			รวมจำนวนเงินที่ขอเบิก	

ผู้ขอเบิก	ผู้ตรวจสอบ	ผู้อนุมัติ	ผู้รับเงิน
____________ (....................)	____________ (....................)	____________ (....................)	____________ (....................)

Figure 3.8: Advanced budget request form
(Adapted from Budget request form, document server of accounting, 2008)

- Valuation tools borrowing:

This document is used by the human resources department to record borrowing-returning history of tools for valuation such as camera, GPS, etc.

Table 3.12: Valuation tools borrowing document

ลำดับที่	อุปกรณ์ที่ยืม	ชื่อผู้ยืม	วันที่ยืม	วันที่คืน
1	GPS No.1 + ตลับเมตร	[redacted]	9/1/2552	14/1/2552
2	ตลับเมตร		12/1/2552	15/1/2552
3	GPS No.3		23/1/2552	27/1/2552

(Adapted from Tools borrow document, document server of human resources, 2008)

- WQS (Weighted Quality Score Table):

WQS is a formatted table for calculating apprised values of properties by weighting them to compare with values of properties nearby.

Table 3.13: Weighted Quality Score Table (WQS)

[illegible] WEIGHTED QUALITY SCORE TABLE												
[illegible]	Ms. Katy Duan 51-FFVGL-034			[illegible]				[illegible]				
[illegible]		ข้อมูลที่ 1	ข้อมูลที่ 2	ข้อมูลที่ 3	ข้อมูลที่ 4	ข้อมูลที่ 5	ข้อมูลที่ 6	ข้อมูลที่ 7	ข้อมูลที่ 8	ข้อมูลที่ 9	ข้อมูลที่ 10	[illegible]
[illegible]	[illegible]	2,237.0	733.0	290.0	63.0	60.0	745.0	440.0	2,676.0	815.0	310.0	2,686.8
[illegible]	[illegible]	300,000	190,000	93,100	75,000	56,700	120,000	60,000	100,000	26,000	120,000	
[illegible]	(%)	-20%	-20%	0%	0%	5%	-20%	-10%	-20%	[illegible]	-20%	
[illegible]	[illegible]	240,000	152,000	93,100	75,000	66,808	96,000	54,000	80,000	37,500	96,000	
[illegible]	[illegible] (%)	[illegible] ข้อมูลที่ 1	[illegible] ข้อมูลที่ 2	[illegible] ข้อมูลที่ 3	[illegible] ข้อมูลที่ 4	[illegible] ข้อมูลที่ 5	[illegible] ข้อมูลที่ 6	[illegible] ข้อมูลที่ 7	[illegible] ข้อมูลที่ 8	[illegible] ข้อมูลที่ 9	[illegible] ข้อมูลที่ 10	[illegible]
[illegible]	20.00%	9	8	7	7	7	8	7	7	8	6	7
[illegible]	10.00%	9	8	7	7	7	7	7	7	8	6	7
[illegible]	10.00%	9	8	7	7	7	7	7	7	8	6	7
[illegible]	10.00%	9	7	7	6	6	6	7	5	7	7	7
[illegible]	10.00%	10	8	8	8	8	6	8	8	8	8	8
[illegible]	10.00%	8	8	7	7	7	6	7	7	7	7	8
[illegible]	10.00%	7	8	8	7	6	9	9	7	8	9	7
[illegible]	10.00%	8	8	8	5	8	9	9	9	8	9	8
[illegible]	5.00%	8	8	8	9	6	9	8	8	9	8	8
[illegible]	6.00%	9	8	8	7	7	7	7	7	7	7	7
[illegible]	100.00%	866	790	718	736	706	776	735	735	696	695	716
COMPARABLE OF WEIGHTED QUALITY SCORE												
[illegible]	(1.0000)	0.8497	0.9304	1.0362	1.0096	1.0000	0.9464	1.0000	1.0290	1.0575	1.0526	
[illegible]	(บาท)	203,931	141,418	96,378	75,000	56,806	91,046	54,000	82,238	71,396	101,325	
[illegible]	(%)	0%	5%	5%	15%	10%	10%	10%	20%	20%	5%	100%
[illegible]	(บาท)	0	7,071	4,819	11,250	5,599	9,105	5,400	16,448	14,277	5,076	80,134
[illegible]					[illegible] (บาท)							80,000

(Adapted from WQS, document server of valuation, 2008)

- Job summary:

The Job Summary is created by the human resources department to be used as reference for all members especially for valuers.

Most part of this document contains the same information as the Job List but some fields are recorded in a different format such as property location as long text in the Job List but it is separated into many fields.

Table 3.14: Job summary document [reverse axis]

Topic		Sample Data	
ลำดับ		1	2
วันที่รับงาน		17/1/51	22/1/51
รหัสงาน		51/[redacted]-003	51/[redacted]-004
ชื่อผู้ว่าจ้าง		บริษัท	บริษัท
ชื่อลูกค้าหรือ เจ้าของทรัพย์สินหรือ รหัสทรัพย์สิน		บริษัท [redacted] จำกัด	บริษัท [redacted]จำกัด
วัตถุประสงค์เพื่อทราบ มูลค่าตลาดปัจจุบัน / ประกอบการพิจารณา		ประกอบการตั้งสำรองหนี้	ประกอบการตั้งสำรองหนี้
ประเภททรัพย์สิน		ที่ดินพร้อมสิ่งปลูกสร้าง 5 รายการ	ที่ดินพร้อมอาคารสำนักงานขนาดสามสิบหกชั้น
ประเภทเอกสารสิทธิ์ (โฉนด, น.ส. 3ก., น.ส. 3, ตราจอง, ห้องชุด หรือทะเบียนเครื่องจักร)		โฉนดที่ดิน	โฉนดที่ดิน
จำนวนที่ดิน/ห้องชุด หรือเครื่องจักร (แปลง/ห้อง/รายการ)		3 แปลง	2 แปลง
จำนวนเนื้อที่รวม (ไร่ - งาน - ตรว.) (ตารางเมตร)		11 - 0 - 00.0	3 - 3 - 78.7
ที่ตั้งทรัพย์สิน	ถนนสายหลัก	ถนนสายบางนา - บางปะกง	ถนนรัชดาภิเษก
	ถนนผ่านหน้าที่ตั้งทรัพย์สิน	ถนนโครงการนิคมอุตสาหกรรมเวลโกร์ว	ถนนรัชดาภิเษก
	ตำบล	บางสมัคร	ห้วยขวาง
	อำเภอ	บางปะกง	ห้วยขวาง
	จังหวัด	ฉะเชิงเทรา	กรุงเทพฯ
ภูมิภาค		กลาง	กลาง
วันที่ประเมินมูลค่าทรัพย์สิน		23/1/51	1/2/51
วิธีการประเมินมูลค่าทรัพย์สิน		วิธีคิดต้นทุน	วิธีคิดจากต้นทุน
มูลค่าตลาดปัจจุบันของทรัพย์สิน (บาท)		139,637.00	1,368,852,000.00
ชื่อผู้ประเมิน		[redacted]	[redacted]
ชื่อผู้ประเมินหลัก		[redacted]	[redacted]
วันที่บันทึกข้อมูล		5/2/51	4/3/51

(Adapted from Job summary, document server of human resources, 2008)

- Job submission document:

The human resources department creates a job submission document to send to the client with final reports. It contains list of report to deliver. It is needed to be signed by clients when they receive reports.

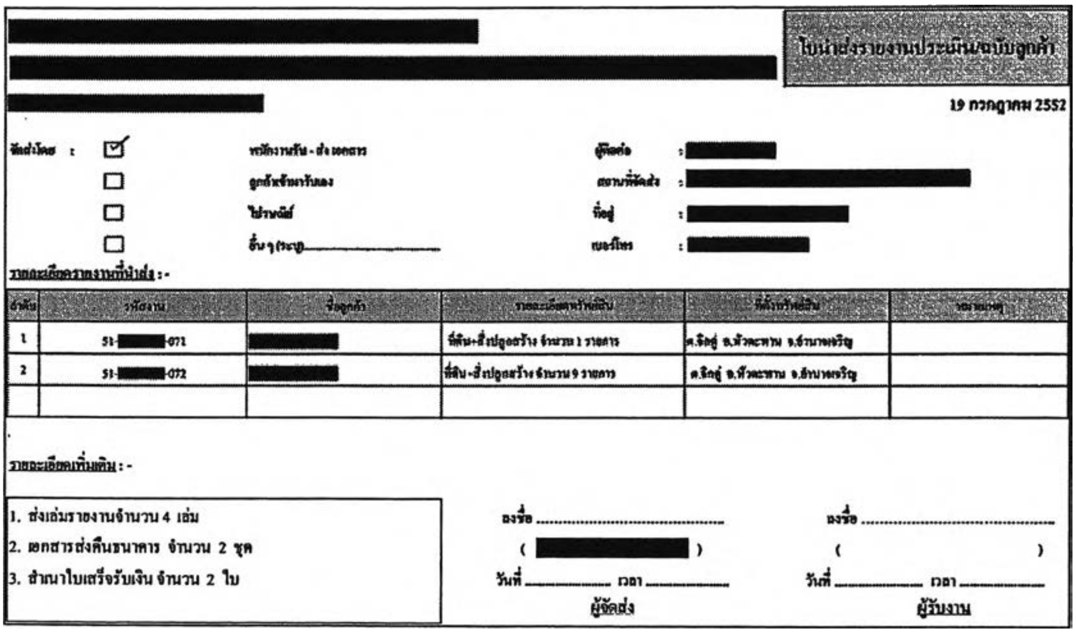


Figure 3.9: Job submission document
(Adapted from Job submission, document server of marketing, 2008)

- **External documents**; usually be received from 3 major institutes
  - 'The Valuers Association of Thailand' (VAT)
    [สมาคมผู้ประเมินค่าทรัพย์สินแห่งประเทศไทย]
  - 'The Securities and Exchange Commission, Thailand' (SEC)
    [สำนักงานคณะกรรมการกำกับหลักทรัพย์และตลาดหลักทรัพย์ : ก.ล.ต.]
  - Department of Land

3.1.3.4 Step 4: Evaluate feasibility

Before the project starts, it is needed to study the feasibility to answer the team about their capability and what they have to concern during the project period. There are 3 fields of feasibility that the company has to concentrate on.

- Operational feasibility; concentrate on requirements, new system's features, and resources
- Technical feasibility; concentrate on hardware and software, technology trends, and skills.
- Schedule Feasibility; concentrate on timeline and resources usage.

In this case, the analysis will be performed by running through the questions in System Analysis & Design book (Gary B. Shelly et al., 2003).

- **Operational Feasibility**

Table 3.15: Operational Feasibility of the Valuation Company

Questions	Answers
Does management support the project?	Yes, the project is originated from management.
Do users support the project?	Yes, every staff knows about this project and ready to share required information.
Is the current system well liked and effectively used?	No, current system is not available. Current work is almost manual processes.
Do users see the need for change?	Yes, they know that the Information System can support their routine work.
Will the new system result in a workforce reduction? **If so, what will happen to affected employees?**	No, the project involves only systematising current work.
Will the new system require training for users? **If so, is the company prepared to provide the necessary resources for training current employees?**	Yes, but the training will not need many resources. All required resources can be supported by the company.
Will users be involved in planning the new system right from the start?	Yes, they deal with this project right from requirement gathering period.
Will the new system place any new demands on users or require any operating changes? **Will performance decline in any way?** **If so, will an overall gain to the organisation outweigh individual looses?**	Yes, but only a bit such as change format of data input. They have to adapt themselves but it is not so hard to do. May be a bit in the first period. Absolutely.
Will clients experience adverse effects in any way, either temporarily or permanently?	They can notice that service level of the company is increased such as. - Quick response for status tracking. - Wrong spellings in report are reduced.

- **Technical Feasibility**

Table 3.16: Technical Feasibility of the Valuation Company

Questions	Answers
Does the company have the necessary hardware, software, and network resources? **If not, can those resources be acquired without difficulty?**	Almost enough, some machines have to upgrade main memory [RAM], disk space [HDD]. Yes.
Does the company have the needed technical expertise? **If so, can it be acquired?**	No.
Does the proposed platform have sufficient capacity for future needs? **If not, can it be expanded?**	For server, the capacity is sufficient for 1-2 years from now. Yes, hardware and software can be upgraded but it is not urgent for now.
Will the hardware and software environment be reliable?	Yes, but they still need maintenance frequently.
Will it integrate with other company information systems, both now and in the future?	For now, other information systems are not available. However, it can be integrated easily to other information systems on windows platform.
Will it interface properly with external systems operated by clients and suppliers?	Suppliers: no need to interface Clients: it may have integration in the future, so data mapping it is considered as the next phases of project.
Will the combination of hardware and software supply adequate performance? **Do clear expectations and performance specification exist?**	Yes. Almost all, the project focusing on current hardware and software specification.
Will the system be able to handle future transaction volume and company growth?	Yes, at least 2-3 years from now. Frequently upgrading software needed for handle jobs in the future.

- **Schedule Feasibility**

Table 3.17: Schedule Feasibility of the Valuation Company

Questions	Answers
Can the company or the IT team control the factors that affect schedule feasibility	Yes, this project is in-house development. Almost criteria are under control.
Has management established a firm timetable for the project?	Yes.
What conditions must be satisfied during the development of the system?	Continuously report progress to executives. Support other technical issues in the company.
Will an accelerated schedule pose any risks? **If so, are they risks acceptable?**	Yes, the accelerated schedule may cause bugs or errors in the system. Yes, IT department can fix them immediately.
Will project management techniques be available to coordinate and control the project?	Yes, but the basic approach is enough.
Will a project manager be appointed?	No, IT staff can control the project themselves.

3.1.3.5 Step 5: Estimate project development time and cost

From all the steps above, the analyst can generate a project schedule which contains steps of work and cost of each phase is shown below.

Table 3.18: Estimate project time and cost

Phase	Time [days]	Workforce	Cost / day	Weight	Cost
System Proposal	21	1	฿800.00	30.00%	฿5,040.00
System Requirement	16	1	฿800.00	40.00%	฿3,200.00
Study solutions	16	1	฿800.00	30.00%	฿2,400.00
Requirement Specification	17	1	฿800.00	80.00%	฿6,800.00
Design Specification	35	1	฿800.00	80.00%	฿14,000.00
System Development	14	2	฿800.00	90.00%	฿12,600.00
System test	30	2	฿800.00	80.00%	฿24,000.00
Go live	20	1	฿800.00	10.00%	฿1,000.00
Other - Upgrade hardware	0	฿10,000.00		-	฿10,000.00
Other - Software license	0	฿20,000.00		-	฿20,000.00
Summary	169 Days			฿99,040.00	

Project time of each phase is summarised from the project schedule in Appendix A. Weights define the concentration of this project. Because members of team are in-house IT staff, they still do routine tasks such as computer and network maintenance. They cannot pay 100% attention to the project.

The average wage per day of staff – all positions of IT staff – is about 800 baht. So the actual cost is calculated using the formula below.

Cost of each phase = (Time) * (Workforce) * (Wage per day) * (Weight)

In summary, the project will take about 169 week days or about 7 months to deliver the Information System and 1 month for real implementation and perform customisation. The total cost of this project – cost of all phases added to software licensed and hardware upgrade – is almost 100,000 baht.

3.2 System Analysis

Information from the planning phase is compiled and transformed into models of the current system. Models are drawn under standard of business and software modelling which illustrate current situations in understandable pictures. The models not only help users to understand the overall current work, but also encourage the analyst and programmers to point out the weak points in processes.

The requirement modelling process typically contains 2 topics to be considered.

1. Current system modelling; create basic models that can define all processes in the workflow and who is responsible for those tasks.
2. Requirements for new system; interview users about new requirements.

3.2.1 Current system modelling

The first step of the system requirement is to create models that illustrate the processes flow of current work. In this step, the analyst will ignore formats of data.

The standard diagrams, UML (the Unified Modelling Language) and IDEF (Integration Definition) that are used for this analysis are listed below.

Table 3.19: List of diagrams

▪ Who / What / Where /When / How and Why
▪ Basic flowchart diagram
▪ Use Case diagram and Description
▪ State Chart diagram
▪ Sequence diagram
▪ Activity diagram
▪ Integration Definition (IDEFØ)

The valuation process of the company can be divided into 2 types of work.

- **Normal job**; starts from client's request to report submission
- **Review job**; starts from report return with request for revision

Normal job

Normal job starts from when the client sends the request and details of the subject properties for appraisal to the marketing department. Staff will analyse all information and compile it to calculate the service cost and select suitable a valuation approach (detail of conditions in Appendix B) to fill in quotation document. The complete quotation document will be sent to the client to consider whether the offered cost is reasonable or not. If the client does not accept the cost, it will be marked as 'cancel' and pushed to the end of workflow. Else – client satisfied with cost – the company continues to create an invoice for him for completing payment under the company's conditions.

After the client completes the payment, the marketing department will add the new record into an internal file called Job List (table 3.11) and create a document called Job Order (figure 3.7) that contains brief information which provides overview of jobs for the valuer. Then, jobs will be queue for assigning to valuer. Executives will select the valuer based on his skills and experiences.

The assigned valuer will receive details of the job and a job order document. He will retrieve old data and the Internet for reference, borrow tools and request a budget. When all resources are ready, the valuer will perform an on-site survey to inspect the actual location to deliver an accurate property value. The valuer comes back with information that required for report creation.

The valuer manages pictures, create location map, land and building layouts, and fills in Weighted Quality Score Table (WQS) (table 3.13) to compare values of assets that return accurate appraised value of the properties.

Remark: sample components of draft report are available in Appendix D.

Documents that the valuer prepared are called Draft Report which is sent to the support department to create a formatted document – Full Report.

The completed full report will be returned to valuer to begin the approval process. The report must be approved in 2 steps – by senior valuer and principal valuer. If the report contains errors, it has to return to correct in various steps.

1) Not enough information; valuer has to survey again for more information.
2) Errors in draft report; valuer must correct them and send to the support department to edit the full report.
3) Errors in full report; the support department has to correct them.

Finally, the final report is delivered to marketing department to copy some important parts and prepare for delivery. Job Submission (figure 3.9) is used for confirming that clients have already received the report. The client verifies the report and decides whether he will accept it or not. If client does not accept, the messenger will get the report back and move it to **'Review job'**. Else – clients agree with all contents – the copied report will be sent to the human resources department to update into Job Summary (table 3.14) – shared document that the used for retrieving job history for reference.

Review job

Review job starts after the final report is submitted to the client but he requests for a revision. The marketing first verifies mistakes in the report and assigns it to the valuer who did this job. The valuer will verify errors in depth and correct them. Mistakes can be classified into 2 major causes as below.

- Review price: About 80% of report is returned to review price. It was only occurred because clients are not so satisfied in their properties' value and request a recalculation. In some cases, valuer may survey again to research more nearby properties to compare with subject properties for more accurate and justify the appraised value.
- Content error: About 20% of reports contain mistakes such as wrong spelling, incomplete map, etc. To correct them, the valuer must correct content of reports. This error is mainly caused from manual processes.

After finishing the correction, the valuer will request for an approval from the principal valuer and send to the marketing department to queue for delivery again. The job summary is updated again by the human resources department.

3.2.1.1 Who / What / Where /When / How and Why

The 'who / what / where / when / how and why' analysis is a method that allows the analyst to ask himself about the whole system functions, steps of work, roles, and input-output. It is used for confirming that he is able to grab all business logic. It is a guideline for programmers when they develop this project.

Table 3.20: Who / What / Where /When / How and Why Analysis

No.	Steps of work	Objectives?	Why to do?	How to do	Pre condition	Starting Point	End point	Role
00	Quotation	Yes	Create Quotation for clients to consider cost of valuation.	Receive job detail from clients If NOT enough => Request for more information Calculate service expense /duration is Bank => Bank Rate is GL => VAT Rate Create Quotation document	Client request for valuation Enough information to create Quotation	Receive detail of job	Quotation is sent to client	Marketing
01	Initiate Job	No	Update Job List [summary report for management]	Key-in job detail into Job List document for reference	Client accept cost Complete payment	Receive payment	New job is added into Job List	Marketing Accounting
02	Job Order	Yes	Create Job Order document for assigned valuer	Create Job Order document Pack with detail of job + CD	Client accept cost Complete payment	Finish update Job List	Finish creating Job Order document	Marketing
03	Assign Job to Valuer	No	Select suitable valuaer.	Top management select suitable valuer by, - Location familiarity - Valuation approaches familiarity - Number of job that currently handle	Finish creating Job Order document	Many Job Order is queue for assign	Job is assigned	Marketing Top management
04	Prepare to Survey	Yes	Prepare data / tools / budget for survey	Study detail of job Query reference Borrow related reports Access the Internet Request for advanced budget Borrow valuation tools	Job is assigned	Valuer receive Job Order and detail of job	Complete praparation	Valuation
05	Survey	Yes	On-site survey	Request for cadastral map(ระวาง) from Department of Land On-site survey Contact property owner Photo / Plot GPS	Complete praparation	Enough resources to survey	Finish survey	Valuation
06	Draft report	Yes	Provide unformatted information that required for creating full report	Prepare these following resources; - Picture of Valuation - Location map - Land layout - Building layout - Weighted Quality Score Table	Finish survey	Valuer back to office	Finish creating draft report	Valuation
07	Full report	Yes	Arrange all information into standard format to deliver	Acquire resources Acquire suitable format to create report Create full report	Finish creating draft report	Request from valuer	Finish creating full report	Support
08	Approval	Yes	Review all parts of report to make sure that it has not mistake and suggest suitable market value.	Request senior valuer to approve - Correction - Completion - Reasonable value If PASS - Request principal valuer to approve -- Reasonable price Else - Incomplete data -- Return to step 5 - Incomplete draft -- Return to step 6 - Mistake in full report -- Return to step 7 Write CD	Finish creating full report	Receive full report to approve	Report is approved	Valuation Support Top management
09	Report Submission	Yes	Deliver report to client	Copy important part of reports for reference Create Job Submission document Queue job for messenger	Report is approved	Enough full report to submit	Messenger submit report	Marketing Human Resources
10	Key-in Data	No	Update Job Summary [reference report for valuer]	Close job Key-in job detail into Job Summary for reference Manage copied report	Client accept report	Finish submission	Job is closed	Human Resources

3.2.1.2 Basic Flowchart

The basic flowchart is a fundamental diagram that is used in various fields of work because it can clearly present steps of work by using specific symbols.

In this case, it can be divided the valuation process into 2 types of flow.

- **Normal job**; starts from client's request to report submission [Figure 3.10]
- **Review job**; starts from report return with request for revision [Figure 3.11]

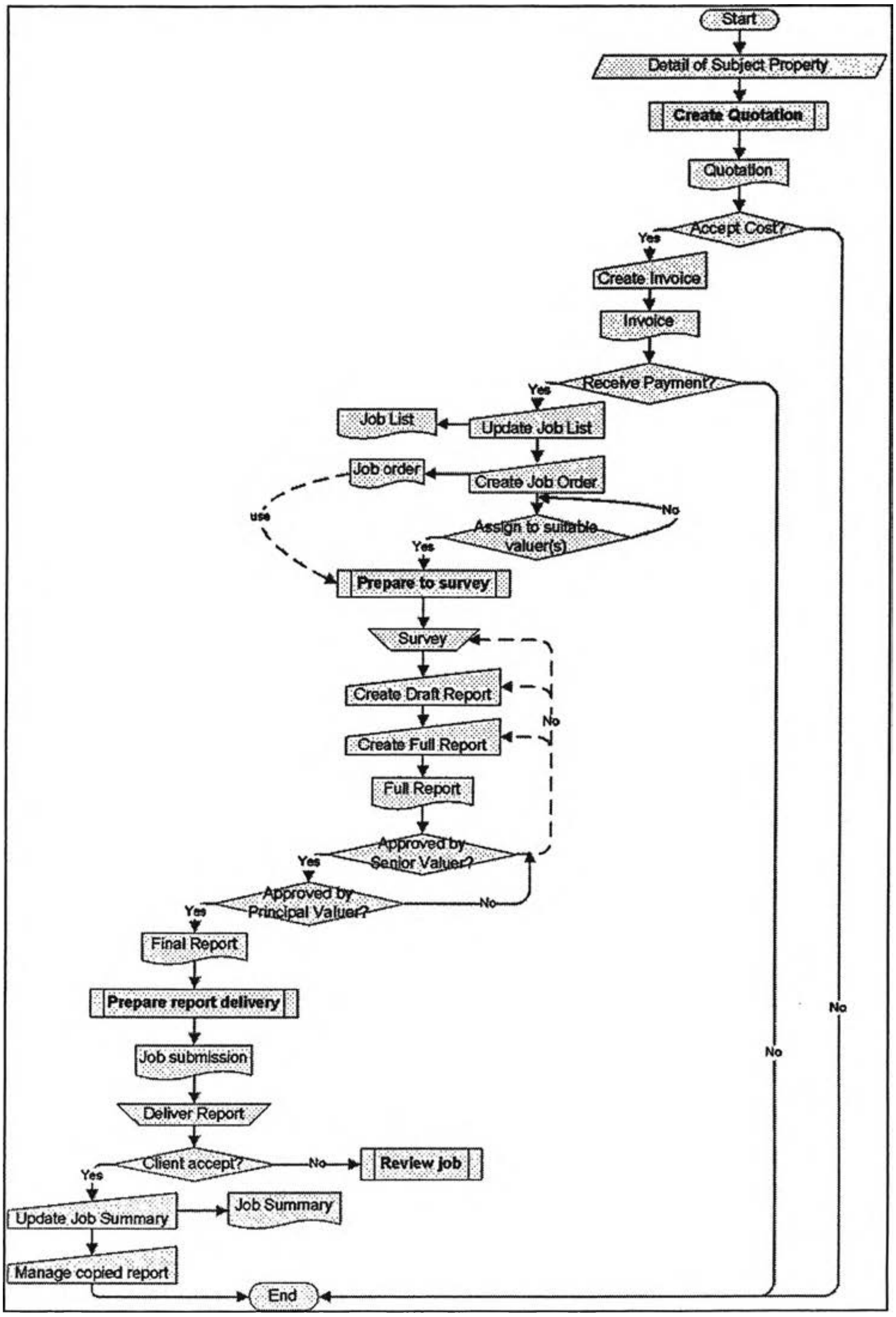


Figure 3.10: Basic Flowchart of normal job [current system]

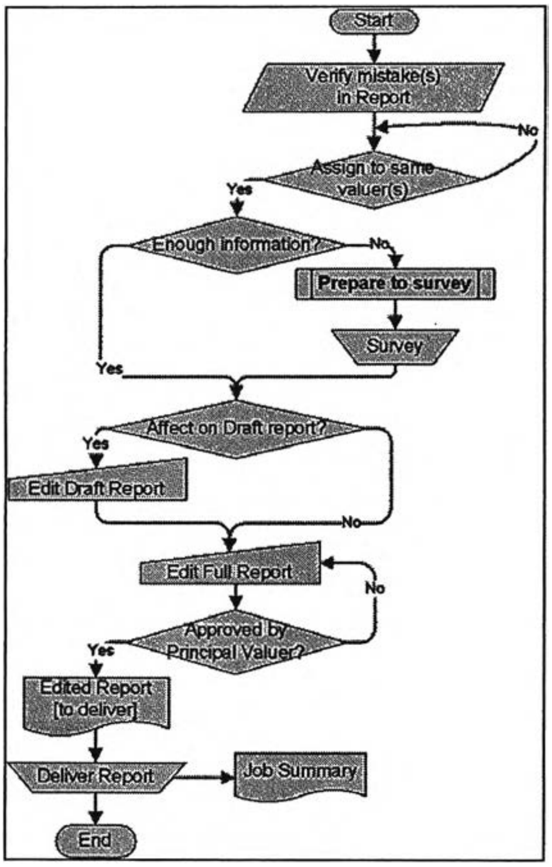


Figure 3.11: Basic Flowchart of review job [current system]

From figure 3.10 and 3.11, it can be seen that the job list and the job summary are documents that both contain detail of jobs. But they are not related because the current platform does not allow data sharing. The same data is inputted in many places – usually in different formats – which hard to manage. This situation causes data inconsistency and a redundancy problem. Input processes of both documents are considered as duplicate and unnecessary tasks. There are 4 sub-systems symbols ( ) which include;

- **Create quotation process** (figure 3.12 top-left) covers receiving job, analysing job detail to set cost, duration, approach, and creating quotation.

  - **Service cost / duration** (figure 3.12 top-right): cost and duration is calculated from detail of each job. If client is bank, or financial institution, or TAMC, the payment method is 'credit within 30 days' and use specific rate from client. If client is general, the payment method is 'cash' or 'cheque' and use VAT rate. Duration is considered from distance and type of properties.

Remark: Sample service rate of VAT is available in Appendix B

- **Valuation approach** (figure 3.12 bottom): valuation approach can be set after analysing detail of subject properties.

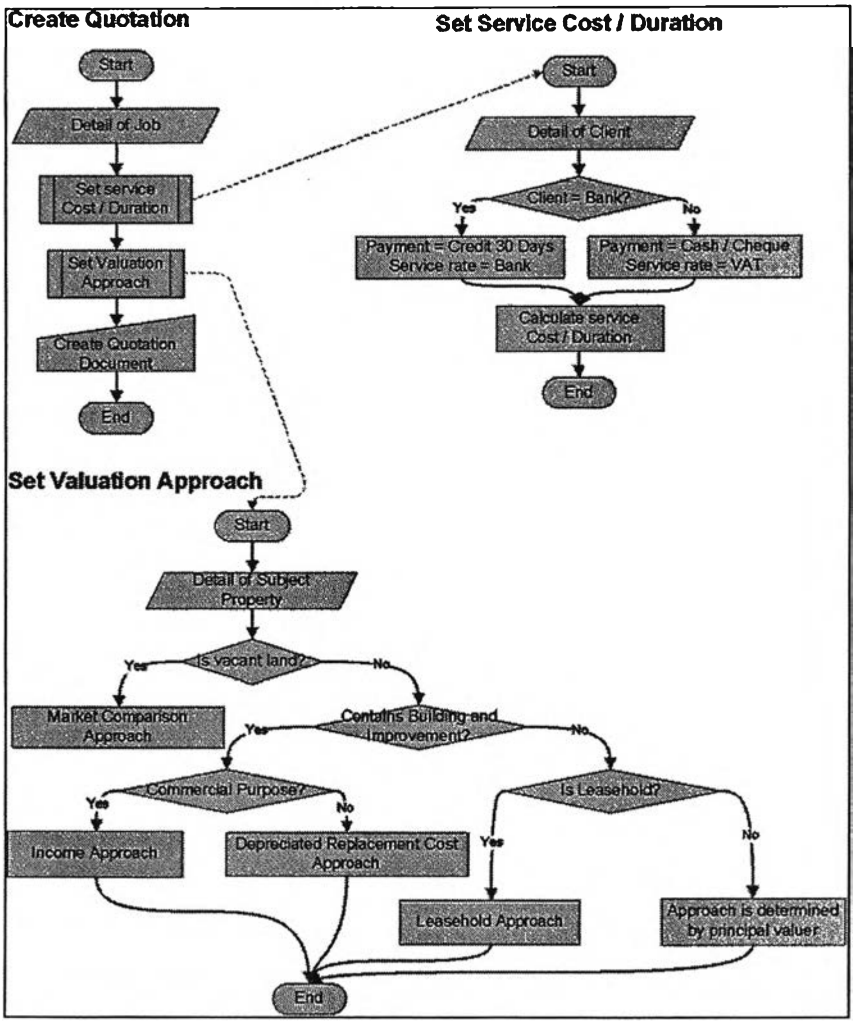


Figure 3.12: Sub-system of create quotation [current system]

- **Preparation for survey** (figure 3.13 - left) starts from when the valuer receives the detail of jobs. Then, he analyses jobs' detail and ask human resources to retrieve old nearby properties Job Summary (table 3.14). If result is not empty, he will borrow copied reports. He accesses the Internet for more details in case of insufficient information. The valuer requests for valuation tools from human resources and an advanced budget from accounting. When getting all information, he is ready to survey.

- **Preparations for job submission** (figure 3.13 - right) starts from when marketing receive the final report from the valuer. They recheck all parts of the report for completeness. Then, they create Job Submission (figure 3.9) and ask the human resources to queue messenger to deliver report.

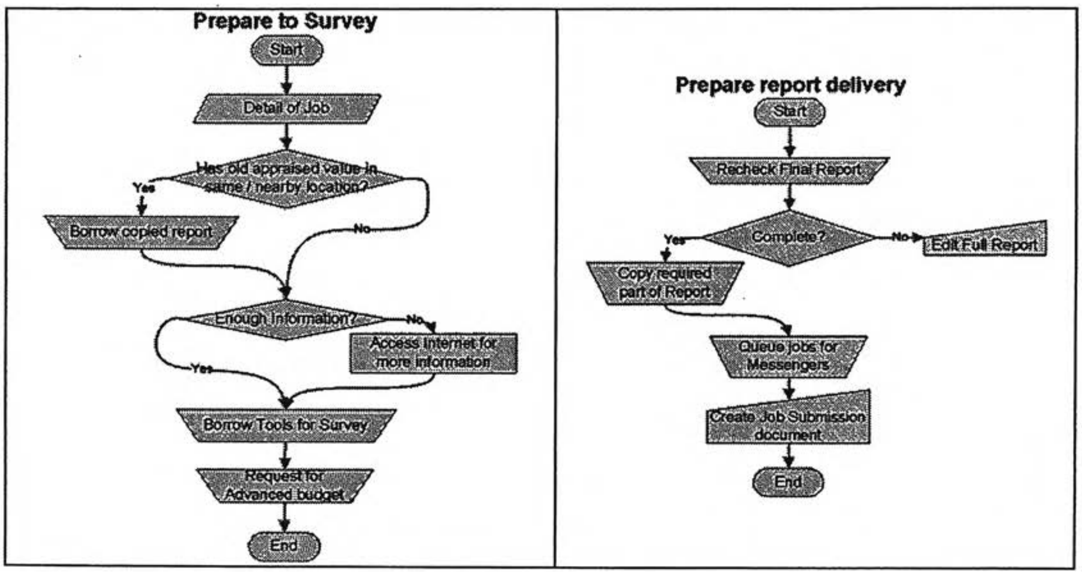


Figure 3.13: Sub-system of prepare to survey and report delivery [current system]

3.2.1.3 Use Case Diagram

Use Case diagram focus on 'what' is users (group by role) act in the system (company). There are 6 roles of users which their permissions to do tasks are;

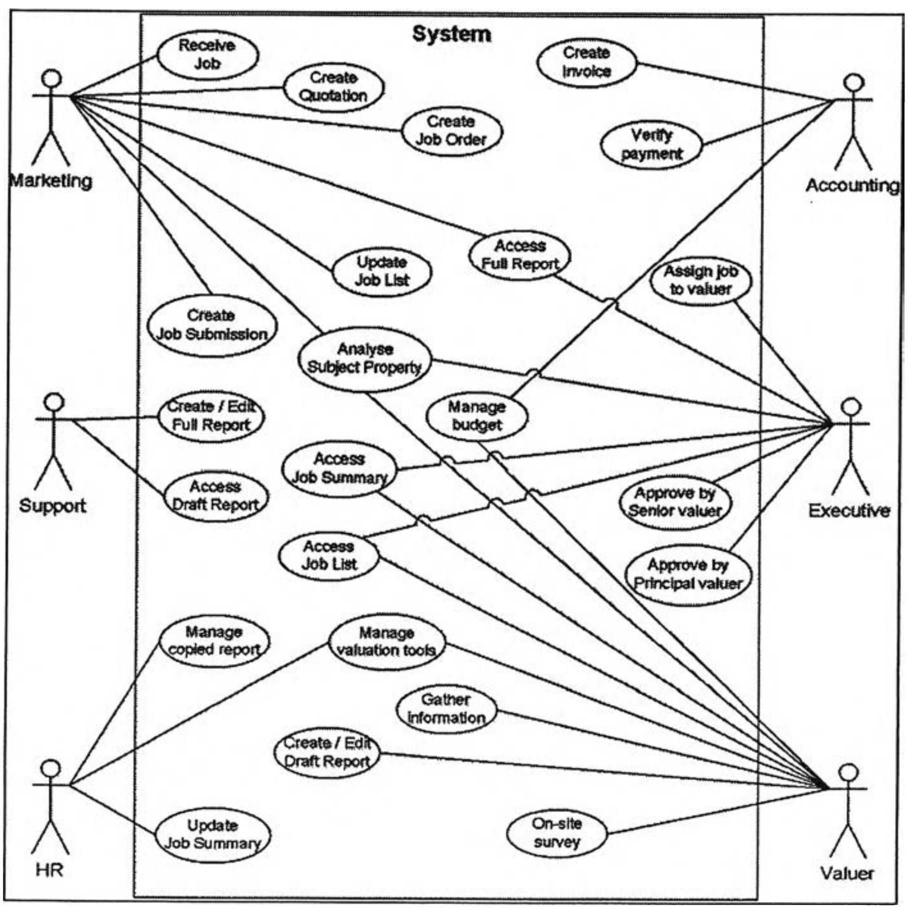


Figure 3.14: Use case Diagram [current system]

Seeing that tasks of each role in current system is quite routine. Staff in department just do the inputted job. There is no reference from other tasks or relations that indicate data flows because of the manual processes.

3.2.1.4 State Chart Diagram

State chart diagram describes more conditions that make the objects are moved from state to state. It can be divided work into 13 states as below.

Table 3.21: State description [current system]

No.	Input state	Conditions to change state	Output state
1	Initial point	Receive request from client	2
2	Job in	Set cost / duration / approach for creating quotation	3
3	Quotation creation	Quotation is created and printed	4
4	Payment	Client accept cost Create invoice and send Client do payment	5
5	Open job	Finish preparing information Job List is updated	6
6	Job order creation	Job Order is created and printed	7
7	Job assignment	Job is assigned	8
8	Survey	Finish survey	9
9	Report creation	Report is created	10
10	Approve I	Approve / Not approve	11 / 9
11	Approve II	Approve / Not approve	12 / 9
12	Job submission creation	Document is created	13
13	Report delivery	Client receive report	Final state

Mapping of states above can be rewrite in standard state chart as below.

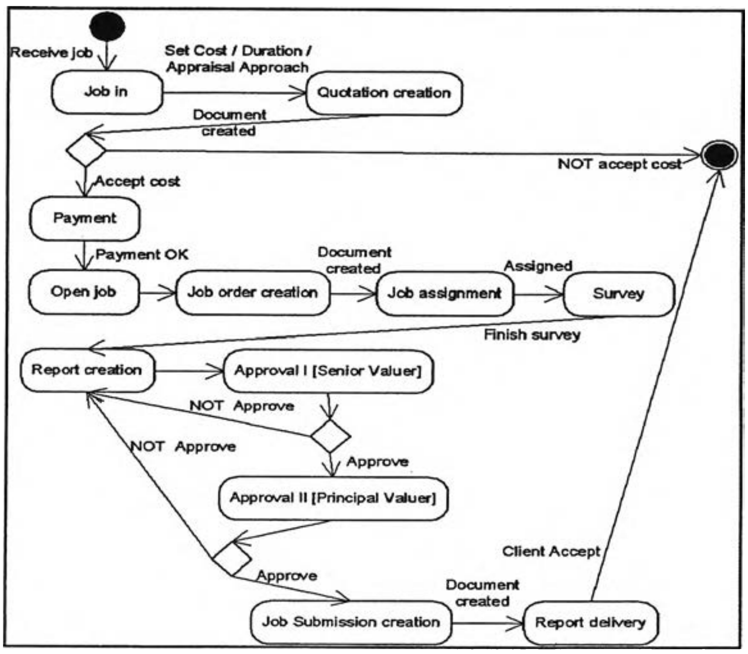


Figure 3.15: State Chart Diagram [current system]

Some states such as payment and report creation are not specific enough to satisfy clients when they ask for progress and some conditions are too ambiguous to convert into logical programming in the development phase.

3.2.1.5 Sequence Diagram

The sequence diagram imitates the set of activities that objects (users in different roles) sequentially perform to others based on period of time.

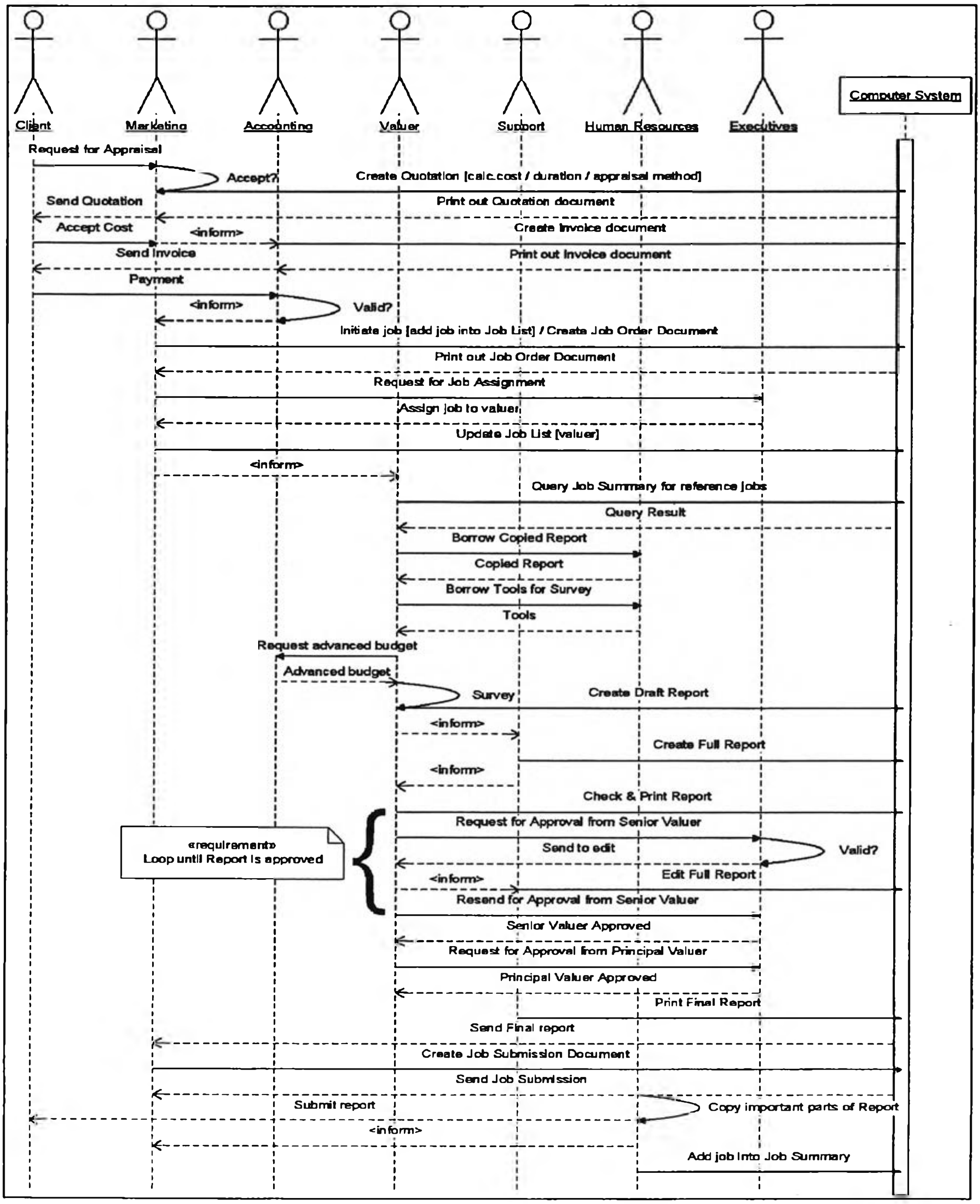


Figure 3.16: Sequence Diagram [current system]

In business level, sequence diagrams can be used for representing communications that flows among the company. Moreover, it can be referenced as requirements for new system. So an improved sequence diagram must be more systematic and conform to functions that the new system will provide.

3.2.1.6 Activity Diagram

Activity diagram mainly gets along with basic flowchart but it has the ability to illustrate movement of the message better than a basic flowchart. Some processes can be executed in parallel ( ) that indicate parallel work which needs to complete all tasks before moving to the next step.

Figure 3.17: Activity Diagram of normal job [current system]

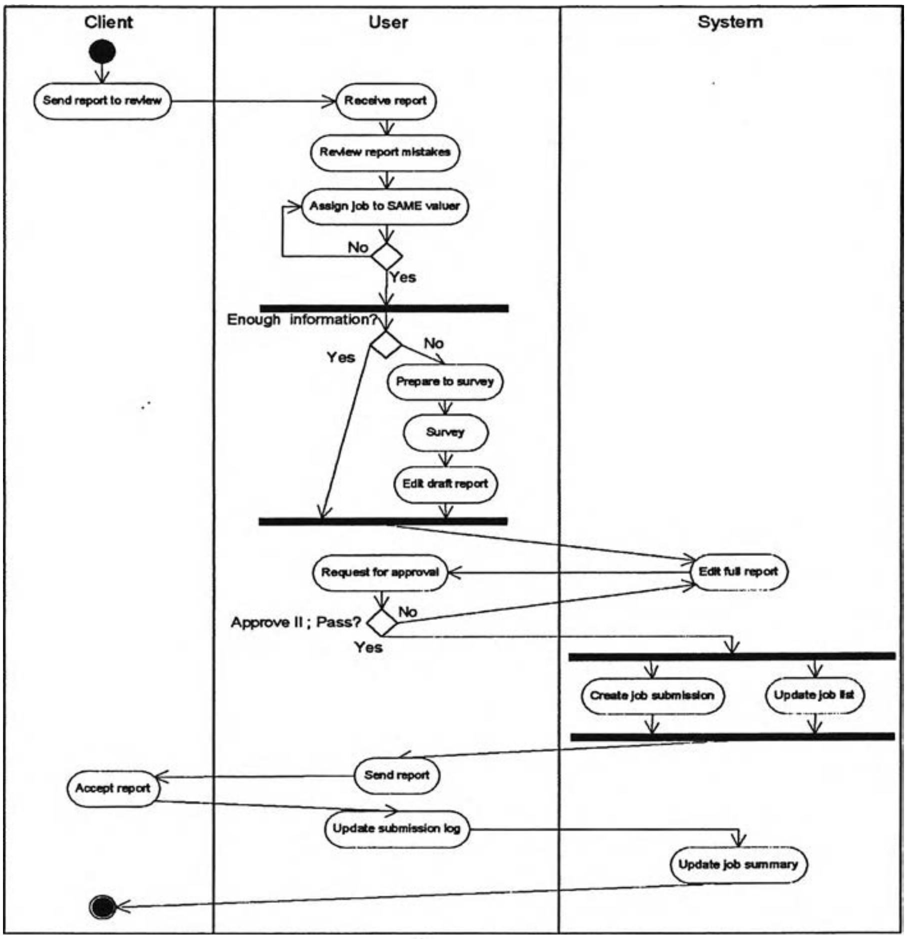


Figure 3.18: Activity Diagram of review job [current system]

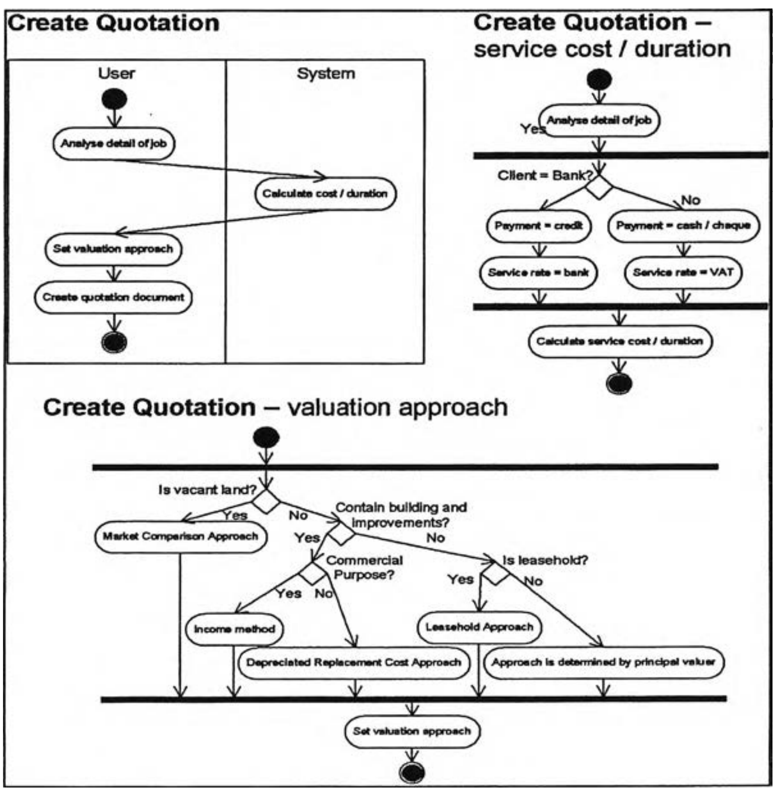


Figure 3.19: Sub-system of create quotation [current system]

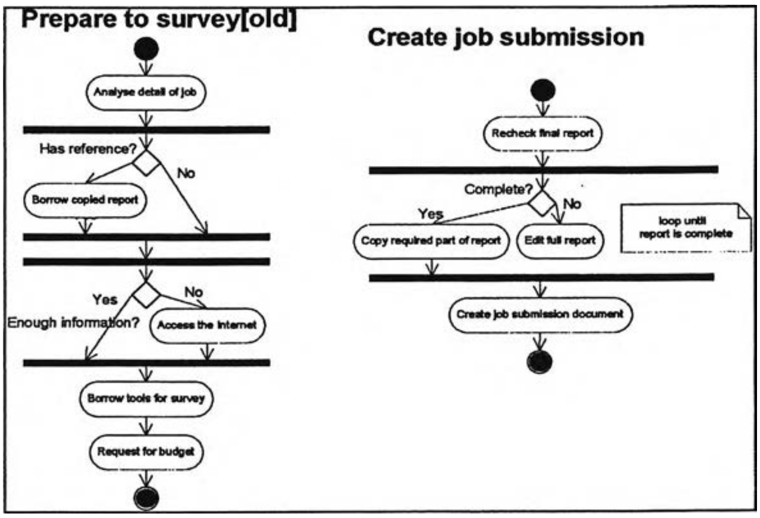


Figure 3.20: Sub-system of prepare to survey and create job submission [current system]

The differences between the activity diagram and the basic flowchart are activities are arranged in 3 areas – client, user, and system – which clearer illustrate where each process is executed and how it actually work. Calculations which are set in the system means computer is used to automate calculation.

However, some processes – especially sub-system – are almost equal as basic flowchart but specific more detail about decision and parallel processes.

3.2.1.7 IDEFØ

IDEFØ – 'Integration Definition' – is a useful process modelling tool. It is generally used for modelling processes for business purposes in order to easily be understood and improved. It generally includes these components:

Table 3.22: Components of IDEFØ

▪ **Context diagram**—The top most diagram in an IDEF0 model.
▪ **Parent/child diagram**—An IDEF0 decomposition hierarchy using parent/child relationships.
▪ **Node trees**—Tree-like structures of nodes rooted at a chosen node and used to represent a full IDEF0 decomposition in a single diagram.

(Microsoft, Inc., 2007: online)

The context diagram of an overall system is 'Valuation Process' that represents all processes. Links that join as inputs / outputs / controls and mechanisms are the combine from all messages that called by sub-systems.

Description of IDEFØ will explain each node in diagram sequentially and study child nodes in depth. A new table that organise inputs, outputs, controls and mechanisms – 'ICOM' – is called 'ICOM table'.

Table 3.23: ICOM table of context diagram

- **Input**
  - Request for appraisal: clients send detail of jobs for appraisal
  - Cost Acceptance: clients agree with service cost
  - Payment: clients complete payment process
- **Output**
  - Quotation: document that contains cost and duration of jobs
  - Invoice: document that contains cost and payment policy
  - Packed report: Job submission document and final report of appraised properties
- **Control**
  - Standard format under VAT
  - Professional standard of SEC
  - Valuation approach
- **Mechanism**
  - Detail of subject property
  - Service rate
  - Internal document templates
  - Report templates

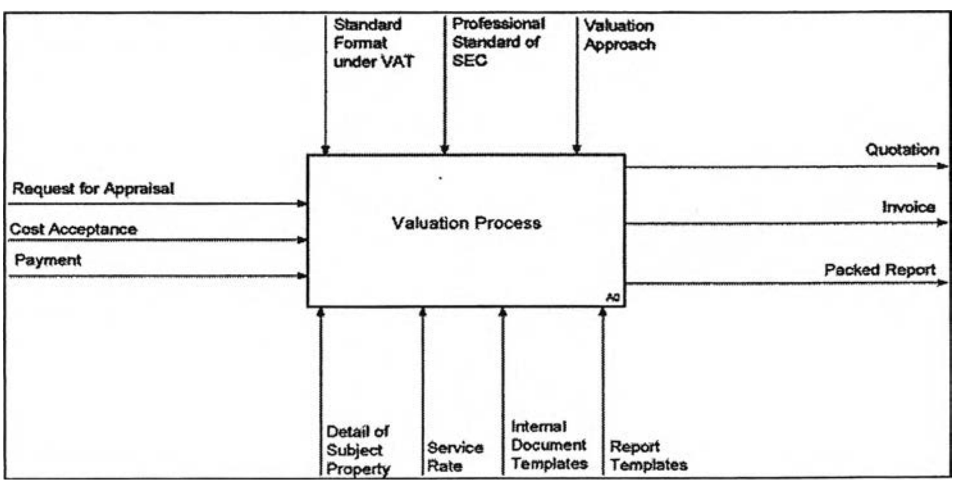


Figure 3.21: IDEFØ level 0 – Context Diagram

Figure 3.22 is child node of context diagram –enumeration of context process to many sub-processes. There are 4 processes inside A0 diagram.

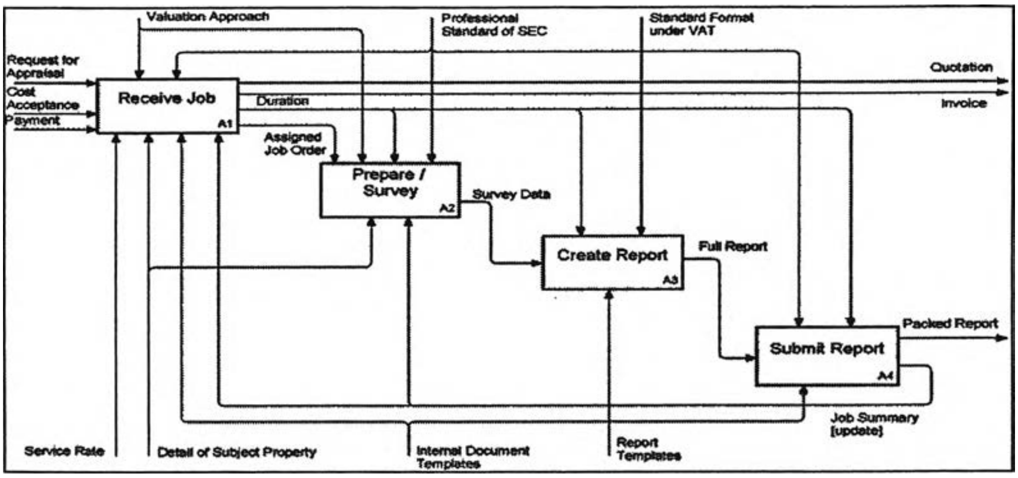


Figure 3.22: IDEFØ level 1 – A0 Diagram

- **A1: Receive Job**; Covers from the request for appraisal to assigning to valuer. This phase is divided into 3 sub-activities.

Table 3.24: ICOM table of A1 Node; Receive Job

Input	**Output**
▪ Request for appraisal ▪ Cost Acceptance ▪ Payment	▪ Quotation ▪ Invoice ▪ Duration: due date and period of job ▪ Assigned Job Order: Job Order that include name of valuer who response the job
Control	**Mechanism**
▪ Valuation approach ▪ Professional standard of SEC	▪ Detail of subject property ▪ Service rate ▪ Internal document templates ▪ Job Summary [update]: latest version of reference document created by HR.

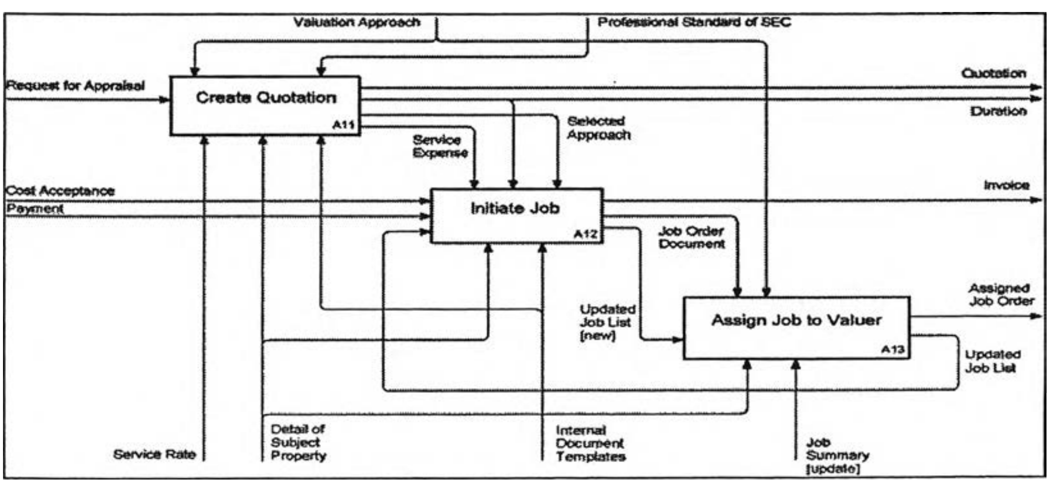


Figure 3.23: IDEFØ level 2 – A1 Diagram; Receive Job

- A11: Create Quotation; covers complete quotation creation processes. It has to be executed 5 steps in figure 3.24.

Table 3.25: ICOM table of A11 Node - Create Quotation

Input	**Output**
▪ Request for appraisal	▪ Quotation ▪ Duration ▪ Service expense ▪ Selected approach
Control	**Mechanism**
▪ Professional standard of SEC ▪ Valuation approach	▪ Detail of subject properties ▪ Service rate ▪ Internal document templates

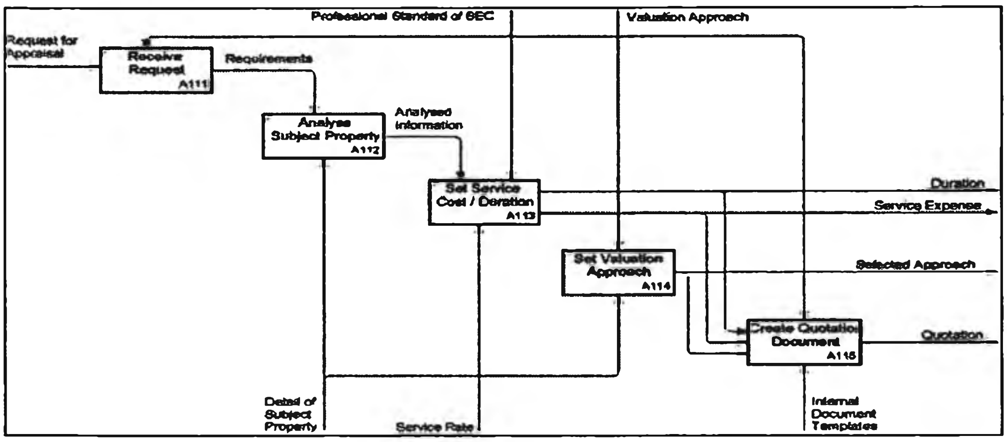


Figure 3.24: IDEFØ level 3 – A11 Diagram; Create Quotation

Activities in A11 can be listed ICOM data of sub-process as below.

Table 3.26: Summary ICOM table of A11 diagram: A111-A115

Receive Request (A111): get detail of job from client	
Input	**Output**
> Request for appraisal	> Requirements
Control	**Mechanism**
> Professional standard of SEC	N/A
Analyse Subject Property (A112): study property in detail	
Input	**Output**
N/A	> Analysed information
Control	**Mechanism**
> Requirements	> Detail of subject properties
Set Service Cost / Duration (A113): calculate for cost / duration of job	
Input	**Output**
N/A	> Duration > Service expense
Control	**Mechanism**
> Analysed information > Professional standard of SEC	> Service rate

Set Valuation Approach (A114): pick suitable approach for job	
Input	**Output**
N/A	> Selected approach
Control	**Mechanism**
> Valuation approach	> Detail of subject properties
Create Quotation Document (A115): fill-in and print-out quotation	
Input	**Output**
> Duration > Service expense > Selected approach	> Quotation
Control	**Mechanism**
> Valuation approach	> Internal document templates

- A12: Initiate Job; starts after the client accepts cost that the company has offered. There are 4 steps in figure 3.25.

Table 3.27: ICOM table of A12 Node - Initiate Job

Input	Output
▪ Cost Acceptance ▪ Payment ▪ Updated Job List	▪ Invoice ▪ Updated Job List [new record added] ▪ Job Order document
Control	**Mechanism**
▪ Service Expense ▪ Duration ▪ Selected approach	▪ Detail of subject properties ▪ Internal document templates

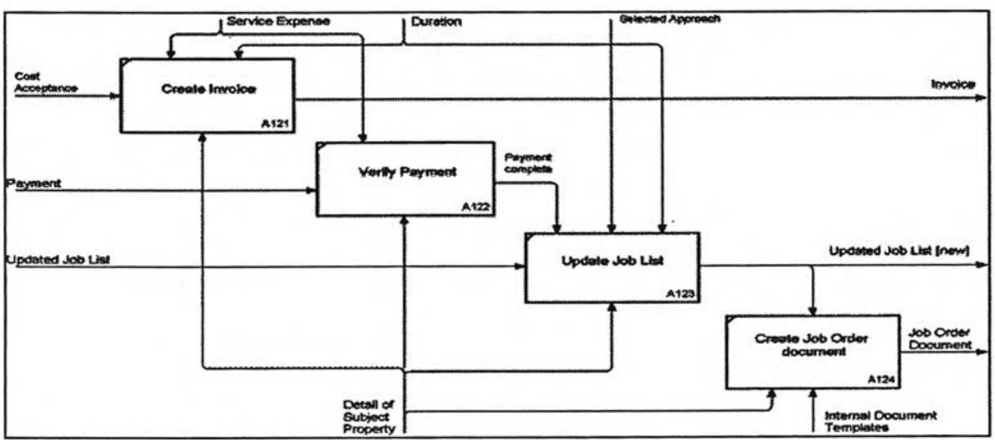


Figure 3.25: IDEFØ level 3 – A12 Diagram; Initiate Job

Activities in A12 can be listed ICOM data of sub-process as below.

Table 3.28: Summary ICOM table of A12 diagram: A121-A124

Create Invoice (A121): fill-in and print-out invoice	
Input	**Output**
> Cost Acceptance	> Invoice

Control	Mechanism
> Service Expense > Duration	> Detail of subject properties
Verify Payment (A122): check payment before open job	
Input	**Output**
> Payment	> Payment complete
Control	**Mechanism**
> Service expense	> Detail of subject properties
Update Job List (A123): insert new record into Job List document	
Input	**Output**
> Updated Job List	> Job List [new job added]
Control	**Mechanism**
> Payment complete > Selected approach > Duration	> Detail of subject properties
Create Job Order document (A124): print-out brief information about job	
Input	**Output**
N/A	> Job Order document
Control	**Mechanism**
> Job List [new job added]	> Detail of subject properties > Internal Document templates

- <u>A13: Assign Job to Valuer</u>; Job Order is printed as detail of job's cover. Job will be queued assigning to valuer.

Table 3.29: ICOM table of A13 Node - Assign Job to Valuer

Input	Output
▪ Updated Job List [new record added]	▪ Assigned Job Order ▪ Updated Job List
Control	**Mechanism**
▪ Valuation approach ▪ Job Order document	▪ Detail of subject property ▪ Updated Job Summary

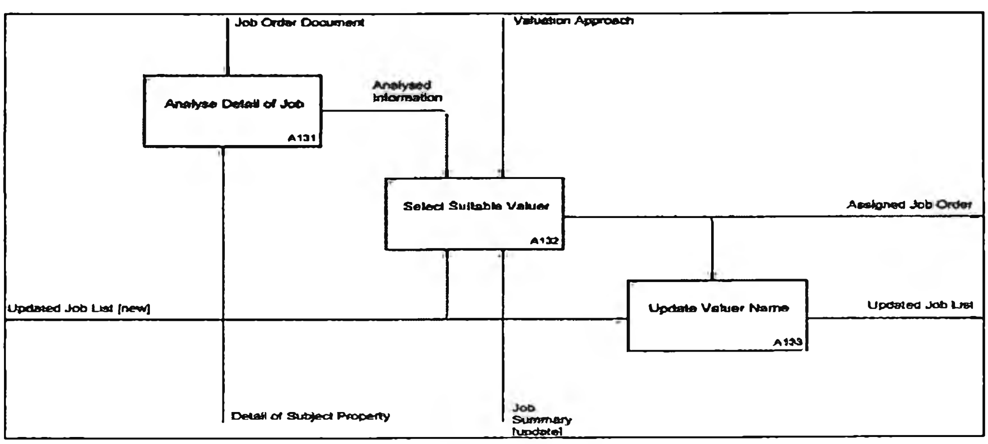


Figure 3.26: IDEFØ level 3 – A13 Diagram; Assign Job to Valuer

Activities in A13 can be listed ICOM data of sub-process as below.

Table 3.30: Summary ICOM table of A13 diagram: A131-A133

Analyse Detail of Job (A131): study job in detail	
Input	**Output**
N/A	> Analysed information
Control	**Mechanism**
> Job Order document	> Detail of subject properties
Select SuitableValuer (A132): select valuer from their skills and availability	
Input	**Output**
N/A	> Assigned Job Order
Control	**Mechanism**
> Analysed information > Valuer approach	> Updated Job List [new record added] > Job Summary [update]
Update Valuer Name (A133): choose suitable valuer for job	
Input	**Output**
> Updated Job List [new record added]	> Updated Job List
Control	**Mechanism**
> Assigned Job Order	N/A

- **A2: Prepare / Survey**; covers all preparation process before performing an on-site survey. This phase is divided into 5 sub-activities.

Table 3.31: ICOM table of A2 Node; Prepare / Survey

Input	Output
N/A	▪ Survey Data
Control	**Mechanism**
▪ Assigned Job Order ▪ Valuation approach ▪ Duration ▪ Professional standard of SEC	▪ Detail of subject property ▪ Internal document templates

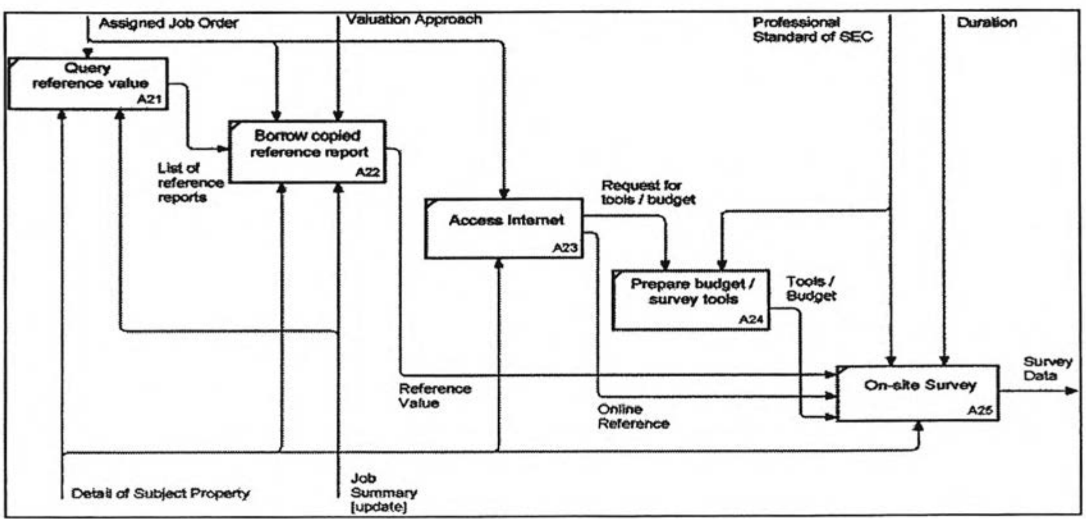


Figure 3.27: IDEFØ level 2 – A2 Diagram; Prepare / Survey

- A21: Query reference value: starts from when the valuer receives details of the job. He must study detail of job and compare with the appraised value of nearby properties from previous jobs for reference.

Table 3.32: ICOM table of A21 Node - Query reference value

Input	Output
N/A	▪ List of reference reports
Control	**Mechanism**
▪ Assigned Job Order	▪ Detail of subject properties ▪ Job Summary [update]

- A22: Borrow copied reference report: Some query result may match to assigned job, so they borrow copied report to get full information.

Table 3.33: ICOM table of A22 Node - Borrow copied reference report

Input	Output
▪ List of reference reports	▪ Reference value
Control	**Mechanism**
▪ Assigned Job Order ▪ Valuation Approach	▪ Detail of subject properties ▪ Job Summary [update]

- A23: Access the Internet: Valuer uses the Internet to access satellite map, appraised values of nearby properties, etc.

Table 3.34: ICOM table of A23 Node – Access the Internet

Input	Output
N/A	▪ Online reference
Control	**Mechanism**
▪ Assigned Job Order	▪ Detail of subject properties

- A24: Prepare budget / survey tools: requests budget for valuation from accounting and borrows tools from human resources.

Table 3.35: ICOM table of A24 Node – Prepare budget / survey tools

Input	Output
N/A	▪ Tools / Budget
Control	**Mechanism**
▪ Request for tools / budget ▪ Professional standard of SEC	N/A

- A25: On-site Survey: Valuer goes to location of properties for survey – metering, picture taking, map sketching, etc.

Table 3.36: ICOM table of A25 Node - On-site survey

Input	Output
▪ Reference value ▪ Online reference ▪ Tools / Budget	▪ Survey data
Control	**Mechanism**
▪ Professional standard of SEC ▪ Duration	▪ Detail of subject properties

- **A3: Create Report**; Report creation processes can be divided into 2 types of report; Draft and Full report. This phase is divided into 2 sub-activities.

Table 3.37: ICOM table of A3 Node; Create Report

Input	Output
▪ Survey Data	▪ Report
Control	**Mechanism**
▪ Duration ▪ Standard Format under VAT	▪ Report templates

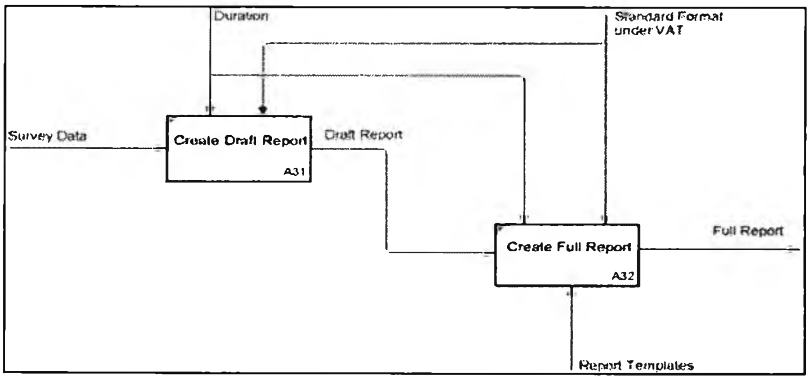


Figure 3.28: IDEFØ level 2 – A3 Diagram; Create Report

- A31: Create draft report; A draft report is created by the valuer and contains pictures, map, layouts and WQS Table.

Table 3.38: ICOM table of A31 Node – Create draft report

Input	Output
▪ Survey data	▪ Draft report
Control	**Mechanism**
▪ Duration ▪ Standard Format under VAT	N/A

- A32: Create full report; A full report is created by the support department. They get all the information from the draft report and transform them into the formatted full report depend on client.

Table 3.39: ICOM table of A32 Node – Create full report

Input	Output
▪ Draft report	▪ Full report
Control	**Mechanism**
▪ Duration ▪ Standard Format under VAT	▪ Report templates

- **A4: Submit report**; covers approval processes, report submission until closing job. This phase is divided into 4 sub-activities.

Table 3.40: ICOM table of A4 Node; Submit report

Input	Output
▪ Full report ▪ Job Summary [update]	▪ **Packed Report**: Full report + Job Submission ▪ Job Summary [update]
Control	**Mechanism**
▪ Duration ▪ Professional Standard of SEC	▪ Internal document templates

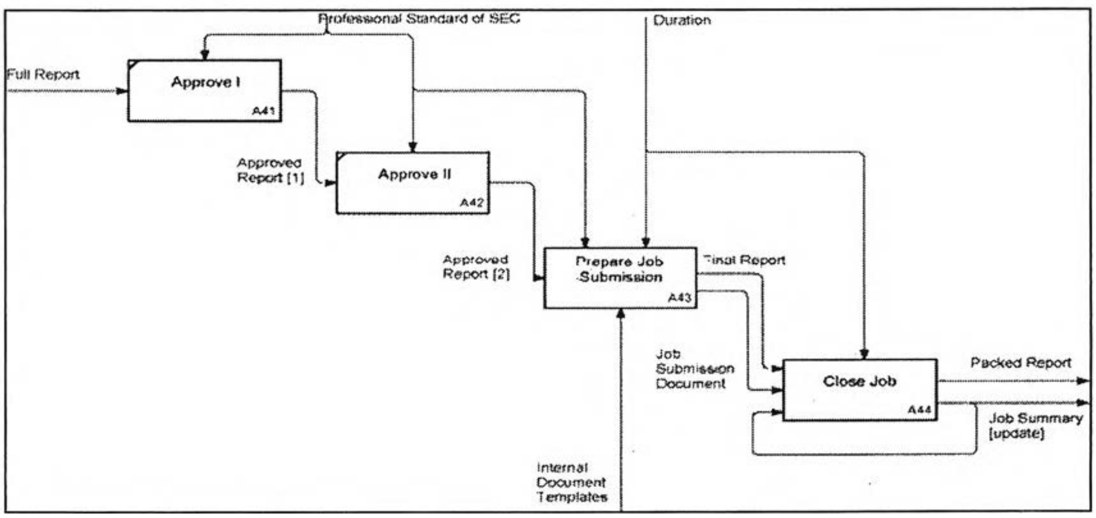


Figure 3.29: IDEFØ level 2 – A4 Diagram; Submit Report

- A41: Approve I: The first approval process is performed by the senior valuer. The report will be rechecked and especially, the appraised value must reasonable. If no error, he will approve. Else, it is sent back to correct.

Table 3.41: ICOM table of A41 Node –Approve I

Input	Output
▪ Full Report	▪ Approved report [1]
Control	**Mechanism**
▪ Professional Standard of SEC	N/A

- A42: Approve II: This approval is performed by the principal valuer. He verifies only the appraised value to decide whether it is reasonable or not. If so, he approves. Else, report must be reviewed again.

Table 3.42: ICOM table of A42 Node – Approve II

Input	Output
▪ Approve Report [1]	▪ Approved report [2]
Control	**Mechanism**
▪ Professional Standard of SEC	N/A

Table 3.36: ICOM table of A42 Node

- A43: Prepare Job Submission: This process will acquire final report – to fill in Job submission document.

Table 3.43: ICOM table of A43 Node – Prepare Job Submission

Input	Output
▪ Approved report [2]	▪ Final Report ▪ Job Submission document
Control	**Mechanism**
▪ Duration ▪ Professional Standard of SEC	▪ Internal document templates

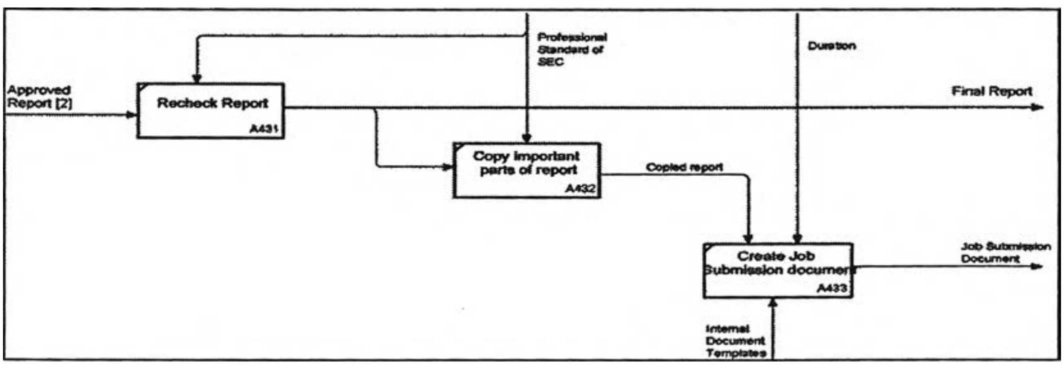


Figure 3.30: IDEFØ level 2 – A43 Diagram; Prepare Job Submission

Activities in A43 can be listed ICOM data of sub-process as below.

Table 3.44 Summary ICOM table of A43 diagram: A431-A433

Recheck Report (A431): final recheck all parts of report by marketing department	
Input	**Output**
> Approve Report [2]	> Final Report
Control	**Mechanism**
> Professional Standard of SEC	N/A
Copy important parts of report (A432): copy report for reference by HR department	
Input	**Output**
> Final Report	> Copied Report

Control	Mechanism
> Professional Standard of SEC	N/A
Create Job Submission document (A433): fill-in and print-out Job Submission	
Input	**Output**
N/A	> Job Submission document
Control	**Mechanism**
> Copied Report > Duration	> Internal document templates

- A44: Close Job; This final step will deliver 'Packed Report'. It covers update Job Summary –reference report.

Table 3.45: ICOM table of A44 Node – Close Job

Input	Output
▪ Final Report ▪ Job Submission document ▪ Job Summary [last update]	▪ Packed Report ▪ Job Summary [new update]
Control	**Mechanism**
▪ Duration	N/A

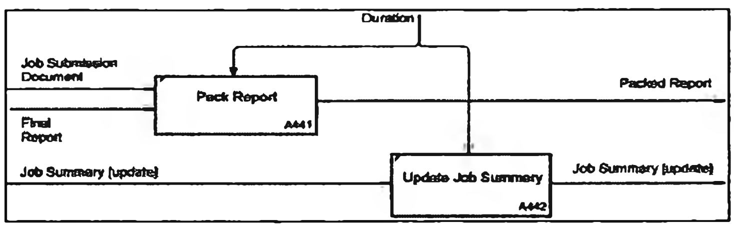


Figure 3.31: IDEFØ level 2 – A44 Diagram; Close Job

It can be summarised the ICOM of fundamental processes as below.

Table 3.46: Summary ICOM table of A44 diagram: A441-A442

Pack Report (A441): pack final report and submission document together	
Input	**Output**
> Job Submission document > Final Report	> Packed Report > Submission information
Control	**Mechanism**
> Duration	N/A
Update Job Summary (A442): update reference of job history	
Input	**Output**
> Job Summary [last update]	> Job Summary [new update]
Control	**Mechanism**
> Duration	N/A

3.2.2 Preparation for new system

Now, the system analyst has enough information to create a clear view about the current work. He gets ideas about errors in the system and the solutions. However, the users' opinions are keys to develop an efficient information system.

3.2.2.1 Requirements gathering from each department

According to weak points of current work that each department describe in the interview section, the analyst will gather opinions from users based on dissatisfaction, and what functions that they need to support their work.

- **Marketing Department**

Table 3.47: Requirement gathering from marketing department

Weak points	Required functions in new system
• Cannot inform job progression because the tracking system is not available => **Clients' complaint** • Cannot control and plan for jobs receivable and expected income.	• Query job status and detail by job code or other core information • To do list of marketing department • Summary report of late delivery

- **Accounting Department:**

Table 3.48: Requirement gathering from the accounting department

Weak points	Required functions in new system
• Work hard with no planning	• To do list of accounting department • Summary report of payment

- **Valuation Department:**

Table 3.49: Requirement gathering from valuation department

Weak points	Required functions in new system
• Job owner, manages flow of paper manually which is not efficient • Parallel work [handle many jobs at the same time] • Cannot focus on core responsibility – valuating asset	• To do list of valuer – list only jobs that assigned to him. • Pending job arrange by due date • Permission to access job history

- **Support Department:**

Table 3.50: Requirement gathering from support department

Weak points	Required functions in new system
• Work hard without planning • Limited resources • Bottle neck	• To do list of support department • Procure new computer systems • List of job arranged by due date

- **Human Resources Department :**

Table 3.51: Requirement gathering from human resources department

Weak points	Required functions in new system
• Work hard with no planning • Almost all data in Job Summary document are already available. => **redundant data / duplicate process**	• To do list of human resources department • Permission to edit job database instead of insert redundant record in other documents or database table.

- **Management:**

Table 3.52: Requirement gathering from management level

Weak points	Required functions in new system
• Not enough information • Hard to manage • 'Bottle neck' in approval process	• Permission to query job database and create specific summary report. • To do list of management level • List of job arranged by due date

After compiling requirements, it can be summarised that the major problems of the company are lack of data sharing and difficulty to access data.

The major functions that a new information system needs to have are;

1. **'To do list'**: the list of tasks that assigned to person. It will list tasks that users have to do and let them make their individual plan to work.
2. **'Information retrieval'**: the required information must be shared and easily be accessed in real time. Users will perform 'quick response' and prevent 'bottle neck' problem that generally occur in manual processes.

3.2.2.2 Data Access

Data access diagram is created based on steps of 'who / what / where / when / how and why' table combining with internal documents and other information. It defines all data fields in documents that are used in each step and also provide a brief method in each step.

It is useful for 'data normalisation' because duplicate data fields are easily noticed and eliminate. Data access diagram may be used for database design.

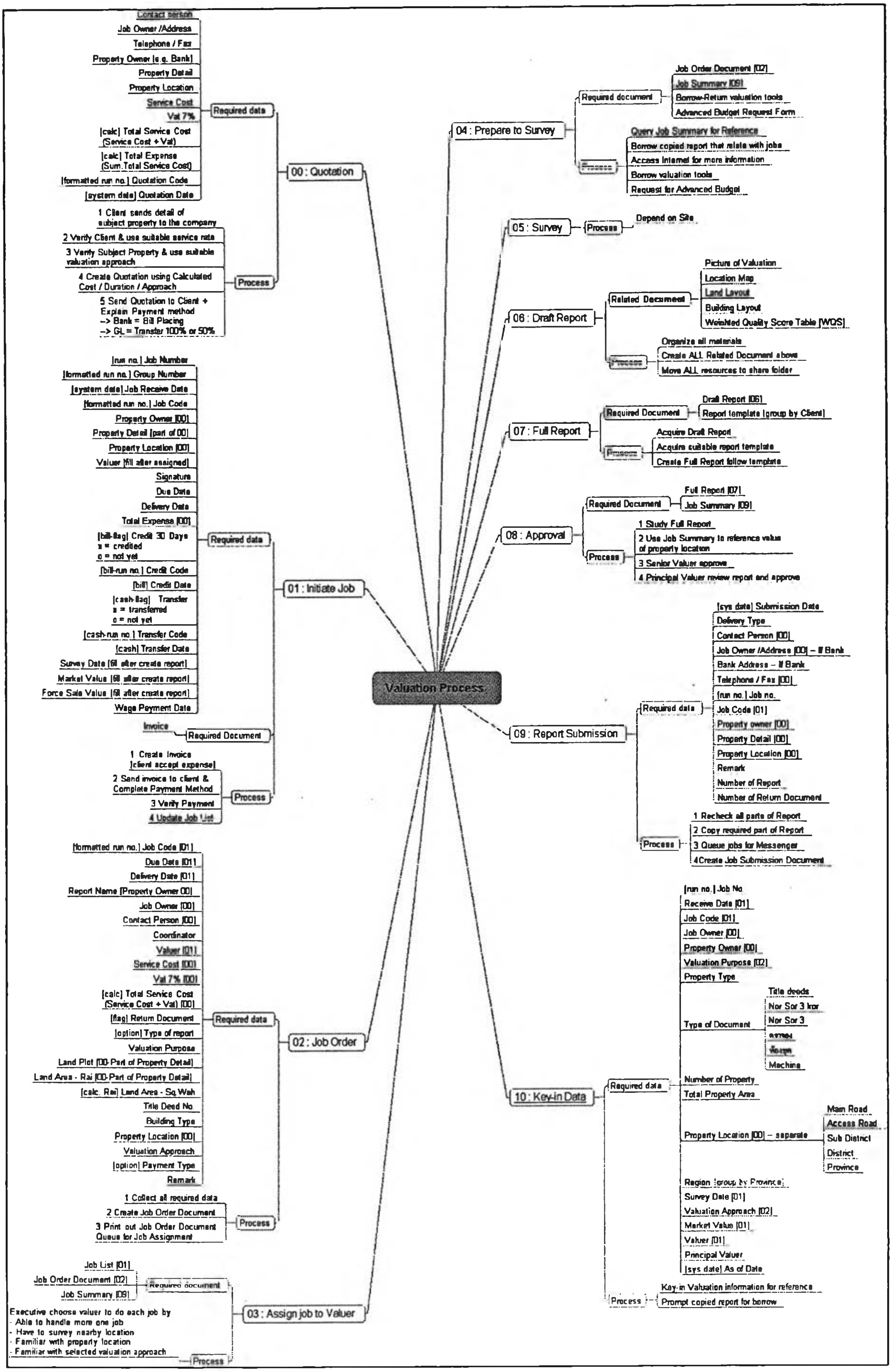


Figure 3.32: Data Access