CHARPTER 2
THEORITICAL CONSIDERATION

2.1 Literature Survey

2.1.1 The Taco Bell Co., Ltd. (Hammer and Champy, 1994: 171-181)

The Taco Bell is a subsidiary company of PepsiCo. The problems of Taco Bell said by John E. Martin, the CEO in 1983, are that the company operated a top-down 'command and control' organization with multiple layers of management, each concerned primarily with bird-dogging the layers below them. It was process-driven, in the old sense of the world, with operational handbooks for everything-including literally, handbooks to interpret other handbooks. It did not know what it wanted to be. If something was simple, the management of the company made it complex and difficult so as to keep everybody busy without regarding of customers.

With the reengineering program, it first created a vision for the company. Then it asked its customers what they wanted. The Taco Bell found that its customers did not want any of those bigger, better, fancier things that the company assumed they did. On the other hand, they really wanted very simple things: good food, served fast and hot, in a clean environment, at a price they could afford. All the rest meant little to them.

After knowing what customers wanted, the company then decided to reduce everything except the cost of goods sold, including the cost of marketing. The company thought that if it created a better deal for the consumer, it would not have to pay so much to twist people's arms to get them to buy the company's product. It launched the reorganization of human resources by eliminating entire layers of management and, and launch a dramatic redesign of the company operational systems by performing completely redefined nearly every job in the system.

For example, it eliminated the 'district manager' supervisor layer who traditionally oversees the management of five or six restaurants. By doing so, the company dramatically changed the job description of the restaurant managers who had previously reported to the district

managers, and changed the job title from restaurant manager to restaurant general manager. The said managers were told to run their own operations without the help of another layer of supervision. How the restaurant performs in terms of sales, profitability, and customer satisfaction is in the hands of the managers, and the company will evaluate the performance and decide the compensation based on those very specific business indicators.

For the reengineering process point of view, one of the programs launched at the restaurant is that Taco Bell downsized the kitchen area and customer area from 70% kitchen and 30% customer area to 70% customer area and 30% kitchen. By doing this, the company can double the number of seats within the same square footage. This reflects that the company maintained one simple rule-enhance those things that bring value to the customers and change or eliminate those that do not. The company achieved a synergy of all processes.

The reengineering efforts of Taco Bell made sales more profitable, and at the same time, increased the customer satisfaction rating on a continual basis. Since 1989, sales have increased by 22 % per year; the average earnings increased 31%.

2.1.2 Bell Atlantic Co., Ltd. (Hammer and Champy, 1994: 193-199)

Bell Atlantic Corp., the Philadelphia-based, $12 billion communications company that serves the Mid-Atlantic States, used to operate in a monopolistic world, free from competition. It responded to customers' requests according to its own timetable and without excessive regard for the quality of service it provided. One of its businesses that 20% of its revenues and nearly half of its profits involves providing carrier access services, or CAS.

CAS is simply the link between Bell Atlantic's customers which are residential and business and their selected long-distance carriers, such as AT&T, Sprint, and MCI. Each of Bell Atlantic's seven regional operating companies had its own procedures for handling a carrier access request, but processing a request and hooking up the service typically took Bell Atlantic about

fifteen days-and as much as thirty days for corporate customers needing a link for their high speed and video communication.

The company faced the competition problem with newcomers who built fiber-optic cables, a technology that Bell did not have yet, in metropolitan areas where the Bell had large corporate customers with heavy demands for voice, high-speed data, and video communications. The new company could not only provide more reliable and less expensive service to these customers, it could process service orders in a quarter of the time it took Bell Atlantic.

Regis Filtz, the head of CAS of Bell Atlantic in 1990, recognized the difference of performance between Bell and the new competitors. He saw immediately that incremental change could make the Bell' performance a little better and a litter faster, only reengineering would improve CAS service sufficiently to reverse the customer loss. So, the Bell Atlantic set up two different kinds of reengineering teams: the core team , and the lab team.

The core team was set up to recommend the ideas. Its job was to brainstorm, to redesign, and to blueprint the new process in detail under the goal given by the company-find the way for Bell Atlantic to provide access services to customers in virtually zero cycle time. There was three reasons for that goal. First the customer said they want it in the long term. Second, meeting this goal would force a substantive change in the existing process, not just a fix. Third, the company thought that zero cycle time was a level of performance that the company's competitors could never beat.

The core team began their work in mid-July of 1992, and within a month, they had designed a new process that physically pulled together under common supervision in one location all of the functions of the old process that had been geographically dispersed, separately managed, and spread among different departments. As soon as a process was redesigned, the lab team who was set up to test and refine the ideas in the real world began their work. Its job was to test the core team's blueprinted design by using it to process real CAS orders. They were empowered to try the

new process, change it however they liked, and then feed back their results to the core team. The lab team became, in effect, a prototype for the case team concept that the core team created.

The lab team took over operational responsibility for servicing customers in a part of central Pennsylvania. Within several months, the team was working with cycle times measured in days instead of weeks. The quality of service improved dramatically, too. The company eliminated four people working full time in tracking CAS orders that were not being completed successfully before the lab team began servicing that group of customers. By doing so, the company saved more than $1 million a year on reworks in just that one location.

As the company reduced the cycle time to zero, the labor costs dropped from about $88 million to $6 million. In addition, the company can keep existing customers and attracting new ones. The company can guarantee three-day installation on high-capacity digital circuits that used to need fifteen days or more. However, the company expects to be able to provide the service within minutes in some selected locations.

2.1.3 Crowe, Rathi, Rolfes (http://www.prosci.com/rathi.htm)

This report has been carried out in two major phases on research in the field of Business Process Reengineering/Improvement. They are:

1) Identification and establishment of a taxonomy of Business Process for electronic equipment manufacturers (SIC Major Group 36) without regard for traditional organizational structures.

2) Development of methodology to establish possible relationships between the strategic objectives of a Strategic Business Unit and the above business processes.

The conclusion of this research affirms two theories:

1) If the organizations need to understand how they work, they need to understand their functioning from a horizontal, process viewpoint, rather than from a vertical, functional point of view.

2) It is the business processes that reflect the true health of the company by bearing a direct relationship with the strategic objectives of the firm.

The research has further developed a methodology by which, with the help of the experts of the firm, it can be possible to identify the business process that need to be reengineered and / or improved the most.

2.1.4 MacIntosh and Francis (http: bprc.warwick.ac.uk/glasgow1.html)

MacIntosh and Francis of Department of Management Studies, Glasgow Business School, studied about the Market, Technological and Industry Contexts of Business Process Re-Engineering in UK Businesses.

By examining some of the seminar works on BPR and highlighting the major debates currently found in the literature, case studied reported by UK business in the literature and popular presses are then examined with three main findings presented. Firstly, a large number of applications are found in the financial service sector. Secondly, there is a remarkable absence of BPR case studies in SMEs. Finally, there is a lack of information available about the failure rates of BPR projects in UK businesses. The implication of BPR is also examined, with particular reference to the type of organization structure implied or required by BPR.

The report concludes that BPR address the need for established enterprises to move a new organization model, from one focused on functions to one focused on processes. This has been accomplished by advancing capabilities of information technology, increased levels of competition, the increasing consumers' sophistication and the threats posed by new entrants who have already adopted completely different modes of operation. As these forces for change appear to be long-run tendencies in developed economies, BPR cannot be viewed as passing fashion.

2.2 Business Process Improvement / Business Process Reengineering

2.2.1 Business Process Improvement

Business Process Improvement (BPI) is a systematic methodology developed to help an organization make significant advances in the way its business processes operate. It provides a system that will aid you in simplifying and streamlining your operations, while ensuring that both your internal and external customers receive surprisingly good output. (Harrington, 1991: 9)

The main objective is to ensure that the organization has business process that eliminate errors, minimize delays, maximize the use of assets, promote understanding, are easy to use, are customer friendly, are adaptable to customers' changing needs, provide the organization with a competitive advantage, reduce excess head count.

The basic step of Business Process Improvement Model is a loop repeating over and over again. It is called continuous process improvement, or also called business process improvement, or functional process improvement. The Business Process Improvement consists of five phases as shown in Figure 2 (Harrington, 1991: 23).

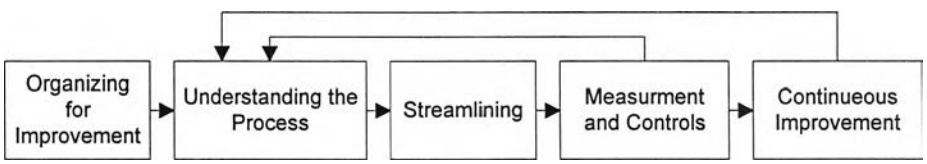


Figure 2.1: The five phases of Business Process Improvement (Source: Harrington, 1991: 23)

2.2.2 Business Process Reengineering (BPR)

Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance,

such as cost, quality, service, and speed (Hammer and Champy, 1994, 32). This definition has four key words: fundamental, radical, dramatic, and processes.

The fundamental involves the most basic questions about the companies and how they operate. These questions are 'Why do we do what we do?' and 'Why do we do it the way we do?' which forces people to look at the tactic rules and assumptions that underlie the way they conduct their businesses. Reengineering begins with no assumptions and no givens. It takes nothing for presumed. It ignores what *is* and concentrates on what *should be.*

The radical means root. Radical redesign means getting to the root of things, disregarding all existing structures and procedures and inventing completely new ways of accomplishing work. Reengineering is about business reinvention - not business improvement, business enhancement, or business modification.

Reengineering is not about making marginal or incremental improvements but about achieving quantum leaps in performance. Incremental improvement requires fine-tuning, but dramatic improvement requires blowing up the old and replacing it with something new. There are three kinds of companies that undertake reengineering: companies that find themselves in deep trouble and have no choice, companies that are not yet in trouble but whose management has the foresight to see trouble coming, and companies that are in peak condition or the companies' management are ambitious and aggressive (Hammer and Champy, 1994: 33-34).

A business process is a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer (Hammer and Champy, 1994: 35). Another definition for a business process is business process are a set of activities that transform a set of inputs into a set of outputs (goods or services) for another person or process using people and tools. A business process consists of a group of logically related tasks that use the resources of the organization to provide defined results in support of the organization's objectives. (Harrington, 1991:9)

Business Process Reengineering (BPR) assumes the current process is irrelevant-it doesn't work, it's broke, forget it. Such a clean slate perspective provides the means for business process designers to disassociate themselves from today's process, and focus on a new process. In other word, it is like projecting yourself into the future and asking yourself: what should the process look like? What do the customer want it to look like? What do other employees want it to look like? How do best-in-class companies do it? What might we be able to do with new technology?

BPR approach can be listed as follow:

- define the scope and objectives of your reengineering project
- then go through a learning process (with your customers, your employees, your competitors and non-competitors, and with new technology)
- create To-Be process
- plan transition
- implementation

For the conclusion, the extreme contrast between business process improvement and business process reengineering lies in where the starting point is (with today's process, or with a clean slate), and with the magnitude and rate of resulting changes.

2.2.2.1 Reengineering Success Factors

More than half of early reengineering projects failed to be completed or did not achieve bottom line business results. The success factors below are derived from Benchmarking studies with more than 150 companies over a 24 months period.

Top Management Sponsorship (strong and consistent involvement)

1. Strategic Alignment (with company strategic direction)
2. Compelling Business Case for Change (with measurable objectives)
3. Proven Methodology (that includes a vision process)
4. Effective Change Management (address cultural transformation)
5. Line Ownership (pair ownership with accountability)
6. Reengineering Team Composition (in both breadth and knowledge)

2.2.2.2 Reengineering Methodologies

There are many methodologies used after the reengineering project area has been identified, but there are four methodologies that are most discussed in the literature and applied by consultants.

Reengineering Methodology 1

1. Describe the project (establish boundaries).
2. Create vision, values and objectives.
3. Redesign business processes and tools (model).
4. Evaluate concept (benefits statement).
5. Plan for implementing the solution.
6. Implement the redesign.
7. Transition to continue process improvement (measures result).

Reengineering Methodology 2

1. Define the project.

2. Document as-is process (diagnose).

3. Redesign business process and technology.

4. Develop a cost / benefit analysis.

5. Plan and Implement new processes and systems.

6. Evaluate process performance.

Reengineering Methodology 3

1. Create project prospectus (define project).

2. Learn from others (customers, associates, benchmarking, and technology).

3. Create vision and design new business process model.

4. Develop enabling technology architecture and organizational model.

5. Perform a gap analysis and prepare a business case for change (benefits and costs).

6. Define process, systems and training requirements, and plan implementation.

7. Develop and pilot solutions.

8. Implement solution and measure performance.

Reengineering Methodology 4

1. Define the project and identify team.

2. Brainstorm new process and technologies.

3. Analyze and prioritize opportunity and design solution.

4. Select 'best' opportunity and design solution.

5. Develop and trial new process, information systems and enabling tool.

6. Plan transition and implement solution.

7. Measure results.

Such methodologies share common element, but simple difference can has a significant impact on the success or failure of a project.

Common attributes among all four methods are all methods define the project before beginning, have a redesign step or 'new idea' step, have a cost / benefit analysis, plan and implement a solution, measure the resulting performance changes.

Unique attributes between all four methods are:

1. Method 1 and 3 create a vision before beginning redesign work.

2. Method 2 documents the as-is process prior to redesign.

3. Method 3 incorporates a learning step.

4. Method 4 initiates idea generation immediately after project definition

5. All methods vary in solution planning and transition activities.

The best one is the one that has been traded-off.

2.3 Activity Based Costing (ABC) Concept

2.3.1 What is ABC?

Activity Based Costing (ABC) is an accounting methodology that assigns costs to activities rather than products or services. This enables resource and overhead costs to be more accurately assigned to the products and the services that consume them. Traditional accounting methodology and ABC as an example is shown in Table 2.1.

Table 2.1 shows that, ABC does not eliminate or change costs. It provides data about how costs are actually consumed. For this example, if the firm want to reduce costs using traditional data, it would have to decrease salaries, or decrease costs of supplies. Using ABC data, it costs the same to paint and inspect the door. Could this step be combined to the lower cost?

Traditional accounting systems are inaccurate in the way that they allocate costs. Large batch or high volume products and services typically incur 50-200% less overhead than they are assigned. Small batch or low volume products and services typically incur 200-1000% more overhead than they are assigned.

This means that products and services that are considered highly profitable may in fact be profit eaters. This inaccuracy is becoming more and more critical as companies move toward customer-defined products and services (which often means a batch size of one).

For the correct associating costs with products and services, ABC assigns cost to activities based on their use of resources (people and machines). It then assigns cost to cost objects like products or customers based on their use of activities. This can help in making decision in several areas, for instance, pricing, outsourcing, capital expenditures and operational efficiency.

Table 2.1 An example of traditional accounting system and ABC

(Source:http:www.prosci.com//abc1.htm)

Traditional	ABC
Salaries $100	Clean door $40
Equipment $80	Paint door $75
Supplies $20	Inspect door $75
Overhead &45	Send door to assembly $55
TOTAL $245	TOTAL $245

2.3.2 ABC Used in Reengineering

In reengineering, ABC can be used to determine the cost and benefits associated with their reengineered process and systems. This cost and benefits analysis will then become part of the overall business case for the project.

By comparing before and after the reengineering project, an ABC approach will describe activities / processes, and frequency and their cost. It will show value of processes i.e. which one is needed to attract and retain customers, resulting in operating savings. In addition, it will show what would happen if we do not do the reengineering project.

An example of the steps in developing ABC data is listed as follows:

1. Define the major business processes and key activities of the organization (Process Map)

2. Trace operating cost and capital charges to key activities. Use existing accounting and financial data which includes labor and capital equipment expenses and any other resource that can be changed / eliminated. Some reports to analyze include are budget, general ledger, supplier invoices.

3. Link activities to processes and identify the cost drivers. The best way to perform this is to actively engage the doers of the process. Have the doers of

the process identify where the costs come from-then seek out data from that sources.

4. Summarize the total cost for each process.

5. Once processes are reengineered then the new costs must be tabulated.

2.4 Pareto Analysis

Pareto analysis or A-B-C analysis is the technique used in selecting the most important items to receive attention when presented with a problem. It relies on the '80/20' rule. In other words 80 % of content of a total is made up by 20% of the contributors. For example, 80 % of the sales revenue of a company is produced by 20 % of the products and 80 % of rejects are usually due to just 20 % of the possible causes.

This technique can also be applied to many fields. (Warwick Manufacturing Group, 1995: 14-15) The typical example of Pareto curve derived from data for the market for an automotive service component. The result is very close to the expected Pareto ratio; 80% of the sales revenue only came from 11 items of 50 products produced by the company.

The first conclusion is that the variety of product could be reduced. It may be uneconomic to continue with some of the items in the product range. In the manufacturing point of view, the company was suggested to concentrate on the most significant contributors to the revenue.

The step in performing Pareto analysis applied in such example is shown as follows:

1. Calculate product of unit value and quantity for each item if necessary.

2. Sort into descending order of value.

3. Calculate the total.

4. For each item calculate percentage of the total.

5. Calculate the cumulative percentages.

6. Graph if required.

Typically, 'A' category items are those accounting for the top 80 %, 'B' category for items are those between 80 % and 97 %, and 'C' items are the remainder.

2.5 Vision and Objectives

'The vision statement expands on the mission statement and involves the next lower level of detail. This is critical in order to establish a linkage between the company's mission and its strengths, weakness, and leadership as well as the opportunities and threats facing it.' (Kuglin, 1998:48-49)

'Generally, objectives are broad statements of what an organization is trying to achieve. The objectives must support and align with the organization's mission and vision. An organization 's vision might be to become part of an extended enterprise value chain. An objective could then be to achieve supply chain management in the organization's distribution channels. A complementary objective could be to achieve customer satisfaction.' (Kuglin, 1998:110)

2.6 Flowcharts

Flowcharting is defined as a graphic description method for existing process or a proposed new process by using simple symbols, lines, and words to pictorially display the activities and sequence in the process. Flowcharts graphically represent the activities that make up a process in much the same way that a map represents a particular area. There are many different types of flowcharts, but four of them are effectively used. They are: Block diagrams, The American

National Standards Institute (ANSI) standard flowcharts, Functional flowchart, and Geographic flowcharts.

2.6.1 Block Diagrams

A block diagram or a block flow diagram is the simplest and most common type of flowchart that provides a quick view of the process. It is used to simplify large, complex process or to document individual tasks. Figure 2.2 is an example of a block flow diagram that provides an overview of the hiring process.

The major symbols used in a block diagram is rectangles and lines with arrows. The rectangles stand for activities, and the lines with arrows connect the rectangles to show the direction of information flow and / or relationship among the activities. Some block flow diagrams also include the elongated circle start and stop symbols that indicate where the process begins and where it ends. A block diagram can flow horizontally or vertically.

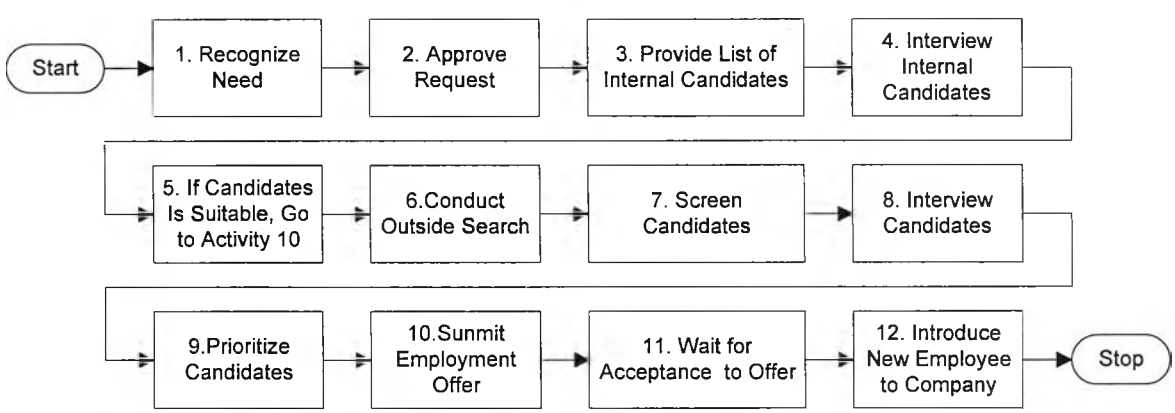


Figure 2.2 Hiring process block diagram (Source: Harrington, 1991: 92)

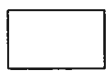
All activities are decoded to tell the story. For example, activity 1: A manager recognizes a need for another employee because of high overtime, an employee leaving, etc. To fill this need, he or she must complete the required forms and get the proper approvals.

Activity 2: He or she reviews the procedure for acquiring a new employee. If desired, each activity or each rectangle can be expanded into a block diagram of its own.

Before going to the ANSI standard flowchart, functional flowchart, and geographic flowchart, some additional symbols must be examined in the standard flowchart symbols.

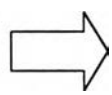
2.6.2 Standard Flowchart Symbols

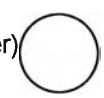
The following are 12 of the most common symbols, most of which are published by ANSI (Harrington, 1991: 96):

1. Symbol 

The Rectangle symbol means on operation. It is used whenever a change in an item occurs. The change may result from the expenditure of labor, a machine activity, or a combination of both.

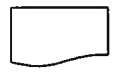
It is used to de-note activity of any kind, from drilling a hole to computer data processing. Furthermore, it is used when no other one is appropriate. A short description of activity should be included in the rectangle.

2. Symbol 

The Fat arrow symbol represents a transportation or a movement. It is used to indicate movement of the output between locations (e.g., sending parts to stock, mailing a letter) 

3. Symbol

The Big circle symbol means an inspection. It is used to signify that the process gas stopped in order to evaluate the quality of output. It typically involves an inspection conducted by someone other than the person who performed the previous activity. It also used when an approval signature is required.

4. Symbol 

The Wiggle-bottomed rectangle symbol means paper documents. It is used to show when the output from an activity included information recorded on paper (e.g., written reports, letters, or computer printouts)

5. Symbol 

The Blunted rectangle or a bullet symbol means a delay. It is used when an item or person must wait, or when an item is placed in temporary storage before the next schedule activity is performed (e.g., waiting for an airplane, waiting for a signature)

6. Symbol 

The Triangle symbol means storage. It is used when a controlled storage condition exists and an order or requisition is required to remove the item for the next schedule activity. It is used most often to show that output is in storage waiting for a customer.

The object of a continuous-flow process is to eliminate all the triangle and blunt rectangles from the process flowchart. In a business process, the triangle would be used to show the status of a purchase requisition being held by purchasing, waiting, for finance to verify that the item was in the approved budget.

7. Symbol  .....

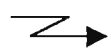
The Open rectangle symbol means an annotation. It is used to connect to the flowchart by a dotted line to record additional information about the symbol to which it is connected.

For example, in a complex flowchart plotted on many sheets of paper, this symbol could be connected to a small circle to provide the page number where the inputs will reenter the process. It is also used to identify who is responsible for performing an activity or the document that controls the activity.

8. Symbol

The Arrow symbol means the direction of flow. It is used to denote the direction and order of process steps. An arrow is used for movement from one symbol to another. It denotes direction –up, down, or sideways.

Even ANSI indicates that the arrowhead is not necessary, it is recommended, by Harrington , that it should always used to avoid misinterpretation.

9. Symbol 

The Interrupted arrow symbol means transmission. It is used to interrupted arrow to identify when immediate transmission of information occurs. (e.g., electronic data transfer, faxes, and telephone call).

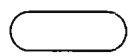
10. Symbol 

The Small circle symbol is a connector. It is used with a letter inside, at the end of flow chart, to indicate that the output from that part of the flowchart will serve as the input to another flowchart. It is often used when there is not enough room to get the entire flowchart on one piece of paper.

An arrowhead pointing at the small circle denotes that the circle is an output. An arrow heading facing away from the small circle denotes that it is an input. Each different output should have a different letter designation. Any output can reenter the process at a number of different points.

11. Symbol 

The Diamond symbol is a decision point in a process at which a decision must be made. The next series activities will vary based on this decision. For instance, 'If the letter is correct, it will be signed. If it is incorrect, it will be retyped,' Regularly, the outputs from diamond are marked with the options (e.g., YES-NO, TRUE-FALSE).

12. Symbol 

The Elongated circle means boundaries. It is used to represents the beginning and end of the process. Generally, the word start or beginning / stop or end is included within the symbol.

2.6.3 ANSI Standard Flowchart

An ANSI standard flowchart provides a detailed understanding of a process that greatly exceeds that of a block diagram. Each task in the process under study can be detailed to the point that the standard flowchart can be used as part of the training manual for a new employee.

An example of the standard flowchart, getting a haircut from the barber and /or going fishing is shown in Figure 2.3, and Figure 2.4. Figure 2.3 shows diamonds as decision symbol representing points at which different paths may be taken. The word yes or no are used to clarify alternatives. The small circles are connector symbols leading to the second page of the chart (Figure 2.4).

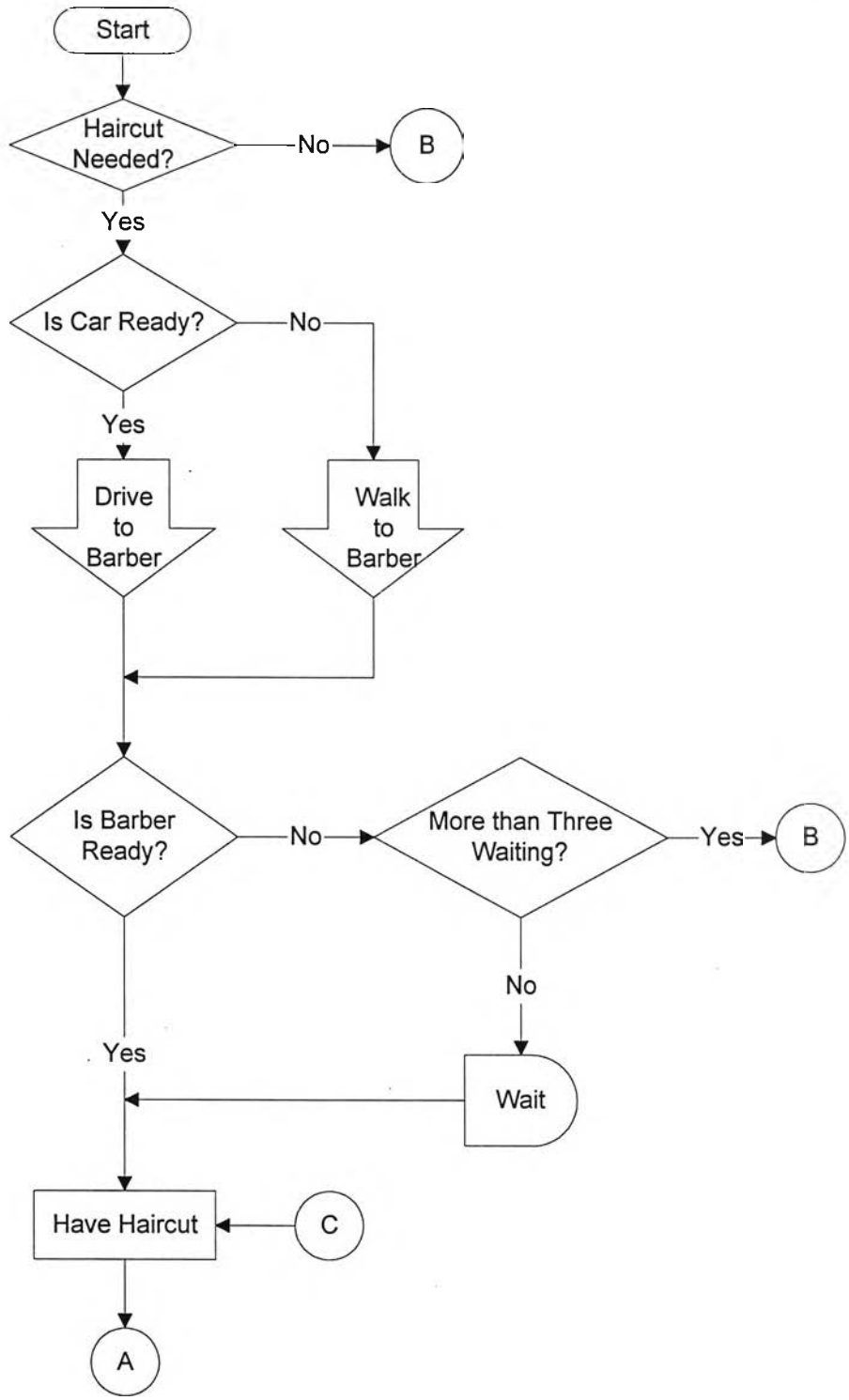


Figure 2.3 A standard flowchart of the first part of the process of getting a hair cut

(Source: Harrington, 1991: 99)

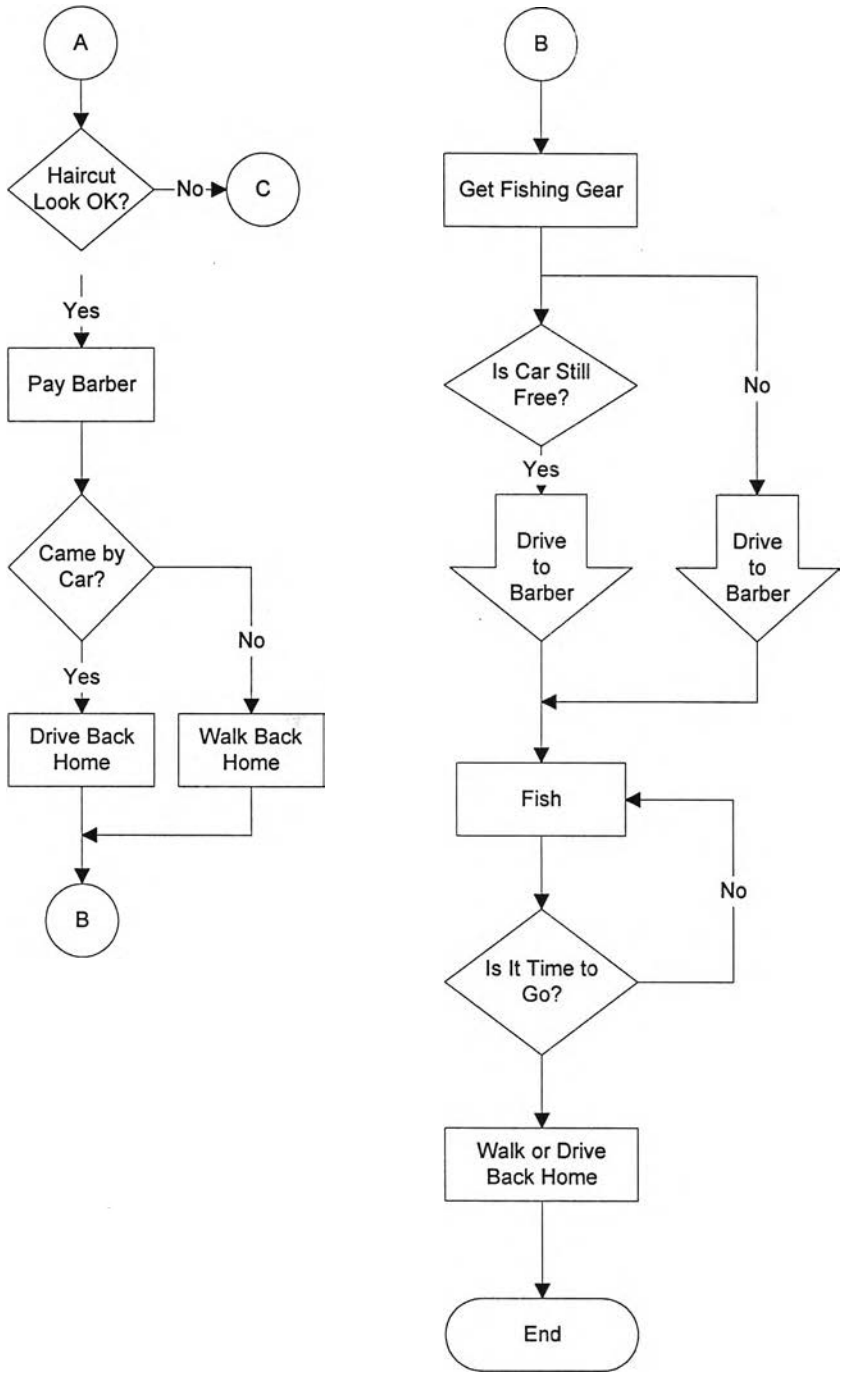


Figure 2.4 Two standard flowcharts of different parts of the process of getting a haircut and / or going fishing(Source: Harrington, 1991: 100)

2.6.4 Functional Flowchart

A functional flowchart provides the picture of the movement between different work units. It is valuable when total cycle time is a problem. It uses either block or standard flowchart symbols.

A functional flowchart identifies how vertically oriented functional departments affect a process flowing horizontally across an organization. Figure 2.5 shows a standard functional flowchart of the hiring process that was block diagram in Figure 2.2 (activities 1 to 5).

The only three of the standard symbols are used to keep the flow chart simple. The first 5 activities in Figure 2.2 have been expanded to 15 activities and separated them by the area performing them. The 15 activities are listed in Table 2.2.

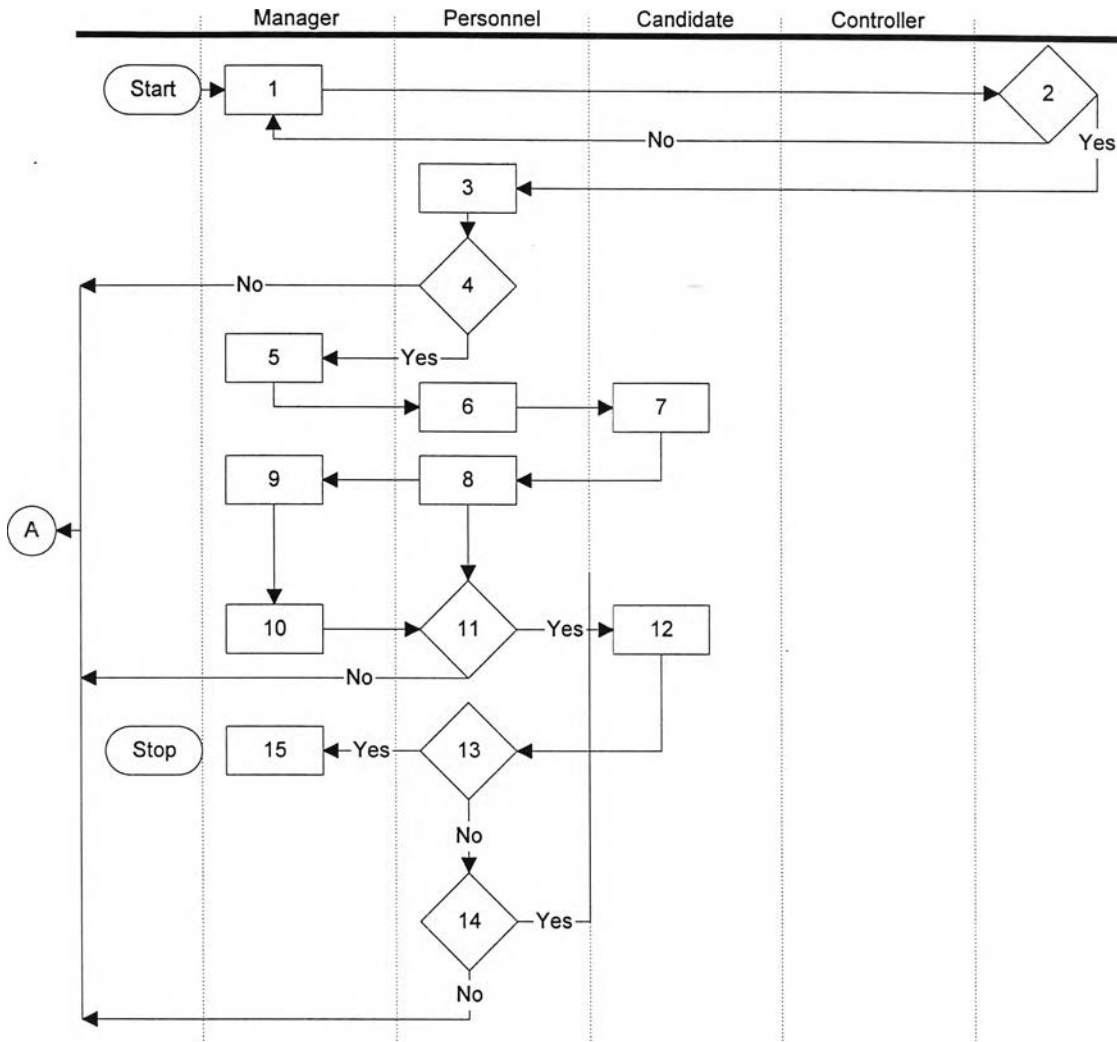


Figure 2.5 Functional flowchart of the internal job search process (Harrington, 1991: 103)

Table 2.2 Activity decoded from functional flowchart (Harrington, 1991: 103-104)

No.	Activity	Responsible area
1	Recognize need. Complete payback analysis. Prepare personnel requisition. Prepare budget request.	Manager
2	Evaluate budget. If yes, sign personnel requisition slip. If no, return total package with reject letter to manager.	Controller
3	Conduct in-house search.	Personnel
4	If in-house candidates exist, provide list to management. If not, start outside hiring procedure	Personnel

Table 2.2 (continued) Activity decoded from functional flowchart (Harrington, 1991: 103-104)

No.	Activity	Responsible area
5	Receive candidates' paperwork and prepare a list of candidates to be interviewed	Manager
6	Have candidates' managers review job with the employees and determine which employees are interested in the position	Personnel
7	Notify personnel of candidates interested in being interviewed	Candidates
8	Set up meeting between manager and candidates.	Personnel
9	Interview candidates and review details of job	Manager
10	Notify personnel of interview results	Manager
11	If acceptable candidate is available, make job offer. If not, start outside hiring process.	Personnel
12	Evaluate job offer and notify personnel of candidate's decision	Candidate
13	If yes, notify manager that job has been filled, If no, go to activity 14.	Personnel
14	Were there other acceptable candidates? If yes, go to activity 12. If no, start outside hiring process.	Personnel
15	Have new manager contact candidate's present manager and arrange for the candidate to report to work	Manager

2.7 Using the FirstSTEP Tool

To model the new customer order process in this case, the FirstSTEP, one of the information technology assets that the case company has invested in has been selected as a tool. FirstSTEP is a powerful tool used to model the business model. It captures the dynamics of a business process and provides animated, on-line viewing of operations with performance graphs. The software can guide for the alternatives process designs by providing a quantitative analysis of cost and duration for complete processes, sub-processes or individual activities. It is also

incorporates a powerful simulation engine that allows quantitative evaluation of the model. After simulation run, you can analyze the performance of processes and resources. Identify possible bottlenecks, highlight resource conflicts, and pinpoint delays. Simulation run can be saved for use in comparison reporting. (Interfacing Technologies Corporation, 1998: 7)

2.7.1 Building A FirstSTEP Model

Creating a FirstSTEP model consists of five distinct steps. These steps are listed as follows (Interfacing Technologies Corporation, 1998: 19):

1. Building High Level Processes

Building high level process is to scope the project. The high level flow diagram shows the main flow of the model with core processes including the process goals, description, value to be delivered, and assumption. Furthermore, it can reflect the owner groups or responsibilities centers. This means that we can describes in terms of who (or which department) is responsible for that process.

With this level the case company can understand of how different processes behave in relation to one another, capture the flow of process inputs and outputs which gives an overview of the way materials and information flow through an organization.

2. Mapping Activities / Lover Level Activity Flow Diagram

For each of high level process, the actual work required by a process is modeled. This represents the flow of work between a series of activities inside the process. The work is performed by single resource or by separate resources working in parallel. FirstSTEP uses 6 basic activity types: Trigger Activity, Terminate Activity, Transform Activity, Verify Activity, Transport Activity, and Distributed Activity.

- Trigger Activity is the starter of the process. It shows that there is an information flow from outside the system into the system.

- Terminate Activity represent the finishing of the process. There will be no information left inside the process.

- Transform Activity is mainly represented the transform of input into output.

- Verify activity is similar to the transform, but it can specify several possible output materials. It is used as a control point, decision point, decision point or for control routing.

- Transport Activity represents the movement of material from one resource to another. It moves material from a source resource's output buffer to a destination resource's input buffer.

- Distribution Activity is similar to the Transport Activity in the idea of moving material, but it produces multiple copies of the output material.

3. Modeling Resources and the Organization Structure

A resource or performer is a person, device, or other entity that performs work in an organization. In FirstSTEP, resources are associated with the groups that comprise the organizational structure, and it is these groups which have responsibility for processes and activities.

4. Modifying Activity Details

During building the activity, some details are needed to key in the program. It describes the task occurring within an activity. These include:

- Allocation of resources (Resource assigned to perform an activity)

- Material input/output
- Source and Destination Resources
- Duration (Length of time it takes to perform the activity)

Other activity details depend on whether they are related to the activity.

5. Performing Analysis and Running Simulation

Performing analysis and Running Simulation eventually provides the two levels of reports: Enterprise Reports, and Dynamic Reports. The Enterprise reports show that data that are static, for example resources group, salary.

In the simulation point of view, the scenario provides understanding of the dynamic of process behavior. Discrete-event simulation means that events happen at a certain point time. FirstSTEP keep track of all these events during a simulation. Events can occur simultaneously or in parallel. This produce a database of statistic results which if saved, can be used to generate report.

2.7.2 Cost Concept in FirstSTEP Tool

Cost concept of this tool can be summarised as follow:

1. Variable cost.

The variable cost is calculated based on the cost associated to resources. For example, if a resources' cost is 100$ / day and the resource performs certain activity for a total 15 hours, then the variable cost of that activity will come out to be 200$. This value is calculated based on the assumption that the resources work 7.5 hours per day.

2. Fixed Cost

Fixed Cost specifies the cost incurred by the activity (not including the cost of the resource performing the activity).

3. Process - Total Processing Cost / Activity –Total Cost

The total cost of the activity/process is composed of this Fixed Cost and any variable cost (the cost of the resource for the amount of time spent performing the activity/process). Each time the activity is performed, the fixed cost is added to the total cost of the activity.