

APPLYING SCENARIO PLANNING TO THE SUPPLY CHAIN IN A SPA BUSINESS IN THAILAND

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ABSTRACT

This article examines some strategies to improve efficiency in supply chains for spa businesses. The methodology comes from various fields. A conceptual framework is developed, to explain the benefits of efficiency, productivity and utilization resulting from scenario planning. The concept of networks from the logistics sector was adapted to the spa business. Data was gathered from one Spa company and the Tourism Authority of Thailand. Well-known performance measurement frameworks in the service sector are reviewed. The proposed framework puts measuring tools into three categories: efficiency, utilization and productivity. These parameters are further sub-divided. Efficiency measures the output obtained in relation to consumption of input (resources). Therapist utilization is indicated by its overall outcomes or impacts. Productivity is a lead performance measure, which focuses on analyzing future performance comparisons. Further division of these parameters will help spa businesses to directly use the framework for assessment of their performance, and will also help in benchmarking their organization so that customers can know the worth of the service for which they pay.

INTRODUCTION

In a service firm, its supply chain delivers service to its customers through its employees, which often involves a significant labor component. Because of the dynamic, time-sensitive nature of service production and consumption and the significant labor component of business service production, then resource requirement variability - both in the number of service units and in the composition of individual service units - must be a consideration in any approach to decision processes of the supporting services. This is a critical aspect for successfully managing a business service enterprise, and a significant opportunity to apply quantitative modeling to gain competitive advantage.

*This is a considerably reduced version of the graduate project report which Ms. Kornkitsuwat, MSc BBA produced to fulfill the degree requirements for the MSc degree in Supply Chain Management at Assumption University, enabling her to graduate in January 2008.

Employee efficiency and profitability allow executive management to focus on tangible return on investment of the organization's workforce. Workforce optimization is especially critical to the financial success of a service organization. Yet although the trends show improved employee efficiency there is no corresponding improvement in employee profitability. Shareholders are not getting the appropriate returns on human capital investment.

Turning now to the Spa business, Thailand has long been recognized for world-class service and hospitality after the introduction of the spa concept in the early 1990s. Today, international spa operators are interested in pouring their investments into Thailand which has become a regional training ground for spa personnel, addressing the market need in a world where demand far outstrips supply. The Thai spa has become a much sought-after model for success both locally and overseas, and it appears that the growth will continue unabated.

Spa-going is a new cultural trend. In Thailand, the market value of the spa industry in 2006 showed rapid growth of 13.3% over 2005, and expected growth of 9.41% in 2007. This high growth is due mainly to government-supporting factors. The Thai government is attempting to make the country a Medical Hub of Asia, looking for ways to expose Thai spa operators to more international attention.

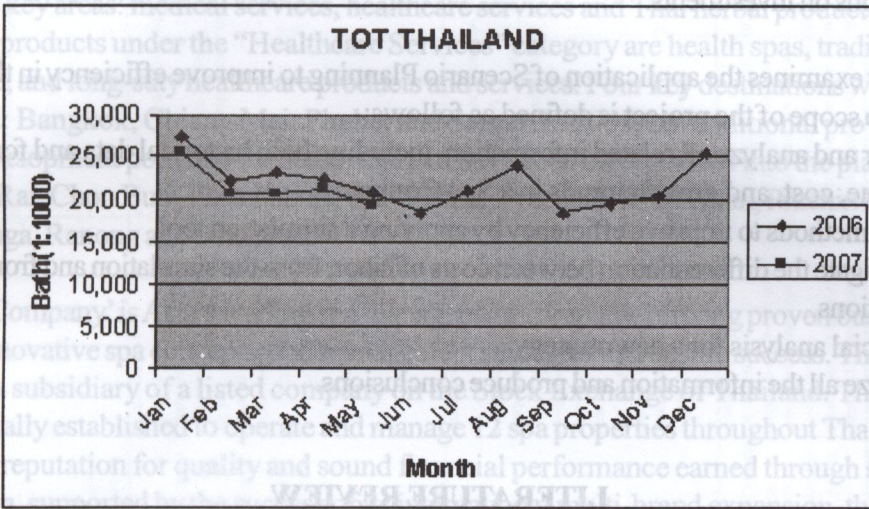
THE SCOPE OF THE PROBLEM

The goal of this research is to assess the feasibility of using a simulation tool to maximize the productive hours of spa therapists. To improve the productive hours of therapists we need either to decrease occupancy per hour or increase revenue generated by therapists. For occupancy per hour there are some limitations which we call independent variables, such as the political situation, and travel trends. Availability per hour can be calculated from occupancy per hour and the head count number.

This research identified the following two problems which affect supply chain efficiency and productivity:

1. **The Bull-whip effect in the spa business, caused by fluctuating demand**, occurs because of different variables at different periods of time: uncontrollable such as natural disaster, political issue, economic crisis, low-high season and social value; and controllable such as promotional strategy, positioning differentiation, and advertising. This bull-whip effect has led spas to greater expense because of the employee situation, especially in the low-season period as shown in Figure 1.1

Figure 1.1: Bull-whip Effect/Fluctuating Demand



Sources: A Spa Company

2. **Increasing employee expenses**, which is due to continuous increase in the standard of living and the high level of employee turnover.

Table 1.1: The Components of Employee Expenses

MSIL - Total Region	2007	2006
Employee Expenses		
Salary & Wages	31.1%	23.4%
Bonus	2.4%	0.0%
Travelling/Housing/Meals	2.0%	2.4%
Medical Allowance	0.1%	0.1%
Insurance	0.2%	0.2%
Uniform	0.2%	0.4%
Social Security Fund	1.9%	1.2%
Others	1.3%	1.9%
Gross Employee Expenses	36.1%	28.8%
Employee Expenses Allocation	0.0%	0.0%
Net Employee Expenses	36.1%	28.8%

Sources: A Spa Company

The following objectives for this study were identified:

- To present a modified service supply chain concept to the Spa Company
- To study the nature of the spa business to improve efficiency in the service supply chain by applying Scenario Planning to maximize productive hours of therapists.

- To conduct a financial analysis to find the Employee Efficiency Ratio (EER) and the Employee Productivity Ratio (EPR) which provide useful information for making decisions on investments.

This study examines the application of Scenario Planning to improve efficiency in the supply chain. The scope of the project is defined as follows:-

1. Gather and analyze all related information, including both historical data and forecasts of revenue, cost, and growth trends in a Spa Company.
2. Study methods to improve efficiency by applying a simulation tool.
3. Investigate the differentiation between costs of labor, from the simulation and from current operations.
4. Financial analysis for a new strategy.
5. Analyze all the information and produce conclusions.

LITERATURE REVIEW

The Spa Business

With the surge in demand for spa services in recent years, investors and entrepreneurs have been quick to spot a promising business opportunity. Supply has followed at lightning speed, igniting the exponential growth of Thailand's spa industry. Spas in Thailand can be divided into four main types, as illustrated in Table 2.1.

Table 2.1: Type of Spa in Thailand

Type of Spa in Thailand	Definition
The destination Spa	A spa whose sole purpose is to provide guests with lifestyle improvement and health enhancement through professionally administered spa services, physical fitness, educational programming, and on-site accommodations. Spa cuisine is served exclusively.
The resort/hotel spa	A spa owned by and located within a resort or hotel property providing professionally administered spa services, fitness and wellness components and spa cuisine menu choices.
The medical spa	Individuals, solo practices, groups and institutions comprised of medical and spa professionals whose primary purpose is to provide comprehensive medical and wellness care in an environment which integrates spa services, as well as conventional and complimentary therapies and treatments.
The day spa	A spa offering a variety of professionally administered spa services to clients on a day-use basis.

Source: *International Spa Association (ISPA), Apichai Jearadisak

In 2004, Thailand embarked on a five-year strategic plan, spearheaded by the Ministry of Public Health, to establish Thailand as 'Centre of Excellent Health of Asia'. The plan focuses on three key areas: medical services, healthcare services and Thai herbal products. The three leading products under the "Healthcare Services" category are health spas, traditional Thai massage, and long-stay healthcare products and services. Four key destinations were initially targeted: Bangkok, Chiang Mai, Phuket and Samui. In 2005, ten additional provinces with high development potential for health tourism have been incorporated into the plan. They are Chiang Rai, Chon Buri, Phetchaburi, Udon Thani, Prachuap Khiri Khan, Prachin Buri, Krabi, Phang-nga, Ranong and Songkhla.

'A Spa Company' is Asia's leading spa management company, offering proven business solutions, innovative spa concepts, and management strategies that ensure success. This spa company is a subsidiary of a listed company on the Stock Exchange of Thailand. The company was initially established to operate and manage 12 spa properties throughout Thailand. With its solid reputation for quality and sound financial performance earned through six years of operation, supported by the success of its international multi-brand expansion, the corporate structure and resources were enhanced to allow for the company's further development and growth of its brands throughout Asia, the Middle East, Africa and emerging global markets, and it has more than 20 spas worldwide.

Service Supply Chain

A supply chain exists to fulfill the demand of the end user every time he wants the product. A Supply chain is one that connects the various echelons that help reach the customer with the desired product. The service chain exists with a single motto: 'Don't sell to customers: help them buy the products'. Supply chains are said to be the carriers of product, information and cash. Service chains take over from supply chains after the product is made available to the end user:

$$\text{Supply Chain} + \text{Service Chain} = \text{Complete Customer Satisfaction.}$$

Four different perspectives of the nature of a service product are summarised in the following Table:

Utilization and Efficiency

The Key Performance measurement is divided into two dimensions, efficiency and effectiveness. The effectiveness dimension is broken up into three sub-dimensions, financial, quality, and logistics. The efficiency measure consist of a dimension of organization functioning, namely workload measures. Purbey et al. (2006) have mentioned that efficiency

Table 2.2: Perspectives of the Nature of Service Products

	Nurmann 2000	Kotabe et al., 2003	Hyöniemi, 2005	Edvardsson, 2005	Prajogo, 2006	Perrigot, 2006
Intangibility	Service is intangible product which difficult to store not used up but continually available for sales and difficult to identify; the supplier of intangible		Intangibility of the services arises from the fact that services are performances rather than physical products and therefore cannot be seen, touched, or felt.	Intangibility denotes that services are activities and not physical objects, as is the case with goods. Often services cannot be seen, felt, tasted, or touched before they are purchased	Intangibility is another key characteristic that differentiates services from manufacturing goods. The implication of this characteristic is that services are more difficult to control and monitor.	Customers cannot see, touch or feel the services offered by the services chains. This intangibility is the reason why services chains often use tangible symbols to inform customers about the quality of their services
Inseparability / Simultaneous		The "inseparability" characteristic of service activities means that service activities are sold, then produced and consumed simultaneously	Inseparability of services means that production and consumption of most services happens at the same time. Goods are first produced and then consumed, whereas for services this happens simultaneously		Unlike manufacturing goods that can be produced, sold, and consumed by customers in a separate place and time, in the service industry these three processes commonly occur simultaneously at the same place and time. In other words, management cannot prepare a buffer between the production and the consumption stage.	Services franchisees, services managers or services employees generally create and deliver the service as the customer is consuming it.
Perishability		Perishability means that services cannot be stored and used at a later time of the service, perishability means that services can not usually be bought when the price is lower and used or resold when the price of the service is higher. Thus, customers are less able to take use of price discounts and store the service. This characteristic of service therefore induces problems if there are strong seasonal or other fluctuations in the demand for service	Perishability means that services cannot be stored and used at a later time of the service, perishability means that services can not usually be bought when the price is lower and used or resold when the price of the service is higher. Thus, customers are less able to take use of price discounts and store the service. This characteristic of service therefore induces problems if there are strong seasonal or other fluctuations in the demand for service	The perishability nature of services often causes capacity problems and introduces uncertainty because of both task characteristics and task interdependencies. The focus is on the activity from the producer's perspective; it does not last and cannot be stored	Services are also perishable. This means that any unused capacity is lost and cannot be stored. This leads to difficulty in reconciling demand and capacity in service operations.	Services are perishable because the creation and consumption of services are inseparable. They cannot be saved, stored, or resold
Inconsistency				The inseparability of production and consumption introduces uncertainty, and it may have the same roots as heterogeneity in the customer perspective. The difficulty in separating production from consumption in services poses challenges		Services are performances produced by people (employees and customers); no two services will be the same.

Source: created by Author

Many studies (e.g. Kotabe and Murray 2003) have stated differentiations in service firms between the two types of service activities involved: core service and supplementary service activities. Core service activities are the essential set of service activities, and if a service firm does not perform these well, it will eventually go out of business. Supplementary service activities are indispensable for the execution of the core service activities.

Since core service activities provided by 'pure' service firms do not involve physical goods, service innovativeness facilitates both the delivery and supporting activities of core service activities. In doing so, 'pure' service firms are able to provide speed, flexibility and accuracy to the customer. In addition, these firms allow the customer to define the core service activities more clearly and have them delivered in a way that suits his/her own needs. Similarly, 'non-pure' service firms also utilize technological innovation in servicing their customers. However, these innovations often involve changing the way supplementary activities are performed, but not the core service activities.

Compared to delivering goods, one of the most distinguishing features of delivering services is the amount of customer contact involved in the service delivery system, following from the simultaneity of production and delivery of services. Many services cannot be delivered without the customer being present, interacting or participating in the service delivery system. This customer influence provides a source of complexity that is not generally found in manufacturing operations. In general, customer contact introduces uncertainties and variation in the service delivery system and makes demands on the design of facilities, staff and technology in the production system.

Productivity in the Service Industry

Source: Al-Darrab, 2000

In service supply chains, human labor forms a significant component of the value delivery process. In services many decisions are taken locally and the variation and uncertainties in outputs are higher because of the human involvement (Sengupta et al., 2006). It is sometimes claimed that productivity is low in many services organizations and that services are produced with excess resources and at unnecessarily high costs. Broadly speaking, firms have two options in this context: either to reduce costs or to increase productivity and efficiency. Service process productivity is dependent both on the throughput time and variability in the time it takes for various tasks to be completed

Utilization and Efficiency

The Key Procurement performance measurement is divided into two dimensions, efficiency and effectiveness. The effectiveness dimension is broken up into three sub-dimensions, financial, quality, and logistics. The efficiency measure consist of a dimension of organization functioning, namely workload measures. Purbey et al. (2006) have mentioned that efficiency

measurement consists of the following sub-indicators:

- Resource utilization: In case of a hospital where there is in-patient department, bed utilization rate is one such criterion; and
- Cost reduction: Service rate can be one of the measures for the same.

Optimizing efficiency is the most important, easiest, and least costly initiative any spa business can undertake to improve its bottom line. Nevertheless, most spa businesses do not take enough notice of efficiency. Efficiency is the optimum use of resources such as employees and production equipment to get the work completed. Efficiency is measured by comparing actual production activities to production standards. Standard production hours are the average time it takes to perform operations and are determined from past production data. The available time is the maximum actual hours that are expected from the work center. It is not likely that this time will be achieved all the time, because of circumstances such as absenteeism. The percentage of time that the work center is active compared to the available time is called work center utilization.

$$\text{Utilization} = \frac{\text{Hours actually worked}}{\text{Available hours}} \times 100$$

It is possible for a work center to utilize 100 hours a week but not produce 100 standard hours of work. The workers might be working at a faster or slower pace than standard working pace, causing the efficiency of the work center to be more or less than 100 per cent. Efficiency distinguishes how much actual production is billable to jobs. It can identify equipment troubles, employee training requirements, process problems, and other performance issues. This is how efficiency is defined:

$$\text{Efficiency} = \frac{\text{Standard hours of work produced}}{\text{Hours actually worked}} \times 100$$

Rated capacity is as follows:

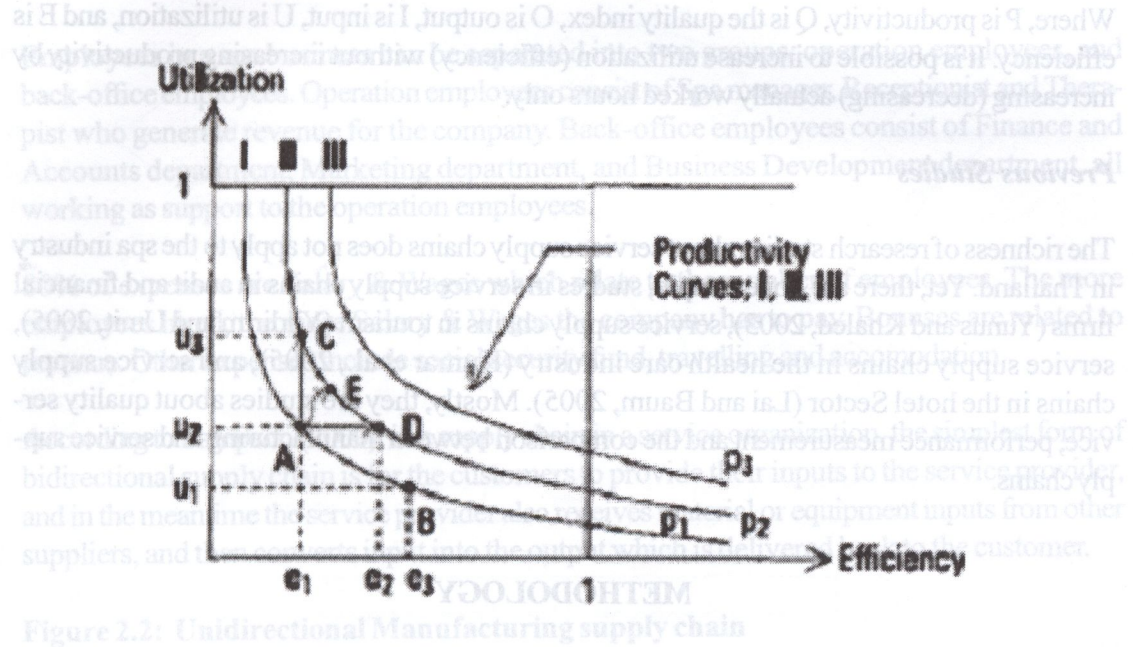
$$\text{Rated capacity} = \text{Available time} \times \text{Utilization} \times \text{Efficiency}$$

Efficiency can be measured on a daily, weekly, monthly, quarterly, or yearly basis for an employee, piece of equipment, task, department, or the entire organization. By measuring efficiencies for each employee, one can determine the capability of personnel and identify who needs additional training. Sometimes this can identify a worker who just may be employed in the wrong job position. Each employee can receive feedback on his/her performance through a monthly efficiency report included with the paycheck.

System improvement analysis defined by Al-Darrab (2000) is that the productivity Equation

can be plotted using efficiency on the horizontal axis, and utilization on the vertical axis. Since utilization cannot exceed 1 (or 100 per cent), an upper limit at 1 is placed on the axis. Efficiency, on the other hand, could be greater than 1 or less than 1. Now various productivity curves, I, II, and III, could be plotted for different productivity levels p_1 , p_2 , and p_3 , as shown in Figure 2.1. Note that the curves could be drawn to the right of the vertical line at efficiency level 100 per cent but, for simplicity, that is not done here.

Figure 2.1: Efficiency-Utilization-Productivity Space



Source: Al-Darrab, 2000

Referring to Figure 2.6, suppose that a work center is at point A, with efficiency and utilization levels at e_1 and u_2 , respectively; then efficiency can be increased to e_3 without increasing productivity but at the expense of reducing utilization to u_1 at point B.

Similarly, if the work center is operating at point B, then utilization can be increased from u_1 to u_2 without increasing productivity. However, this is done at the expense of reduced efficiency. These two 'improvements' in efficiency or utilization do not actually represent system improvements.

Managers could claim these improvements in efficiency or utilization but in reality there is no system improvement because there is no improvement in productivity. Thus, any improvements in utilization or efficiency must be associated with improvements in productivity for them to be considered so. The first implication here is that improvements in efficiency or utilization alone are not enough to guarantee system improvement. The other implication is that improve-

ments in both efficiency and utilization guarantee system improvement. In terms of the variables described in the above sections, any changes in available work hours lead to changes in efficiency and utilization, but they do not lead to changes in system productivity.

In summary, the productivity equation can be written in one of two ways:

$$(a) P = Q \times O/I \quad (b) P = Q \times E$$

Where, P is productivity, Q is the quality index, O is output, I is input, U is utilization, and E is efficiency. It is possible to increase utilization (efficiency) without increasing productivity by increasing (decreasing) actually worked hours only.

Previous Studies

The richness of research studies about service supply chains does not apply to the spa industry in Thailand. Yet, there are, for example, studies in service supply chains in audit and financial firms (Yunus and Khaled, 2003), service supply chains in tourism (Yildirim and Umit, 2005), service supply chains in the health care industry (Kumar et al., 2005), and service supply chains in the hotel Sector (Lai and Baum, 2005). Mostly, they are studies about quality service, performance measurement and the comparison between manufacturing and service supply chains.

METHODOLOGY

Theoretical Framework

In service supply chains, human labor forms a significant component of the value delivery process, and while physical handling of a product leads to standardized and centralized procedures and controls in manufacturing supply chains, in services this is not entirely possible as many of the decisions are taken locally and the variation and uncertainties in outputs are higher because of the human involvement. Also, the focus of efficiencies in service supply chains is on management of capacity, flexibility of resources, information flows, service performance and cash flow management.

In a spa business, a therapist has to take courses to become certified and meanwhile there are traveling costs to go to interview and do training so as to reach the standard of each spa company. After finishing training within a period of time, a therapist has to travel to specific locations again. The cost of each therapist is recorded as an employee cost within each spa. The comparative cost components involved in both networks is illustrated in table 3.1

Table 3.1: The Differentiation between Logistic Cost and Spa Therapist Cost

		Network	
		Logistic cost	Employee Cost
Supplier	Material cost	Certified cost	Therapist
Manufacturing	Transportation cost manufacturing cost Transportation cost	Travelling cost Traning Cost Travelling cost	Training center
Warehouse and distribution center Customers	Inventory cost	Employee Expenses	Spa in Each region Customers

Employees in a spa business can be separated into two groups: operation employees, and back-office employees. Operation employees consist of Spa manager, Receptionist and Therapist who generate revenue for the company. Back-office employees consist of Finance and Accounts department, Marketing department, and Business Development department, all working as support to the operation employees.

80% of expenses are Salary & Wages which relate to the number of employees. The more employees hired, the more Salary & Wages the company has to pay. Bonuses are related to revenue. Other expenses include social security fund, travelling and accomodation.

According to Sampson (2000), in a supply chain in a service organization, the simplest form of bidirectional supply chain is for the customers to provide their inputs to the service provider, and in the meantime the service provider also receives material or equipment inputs from other suppliers, and then converts input into the output which is delivered back to the customer.

Figure 2.2: Unidirectional Manufacturing supply chain

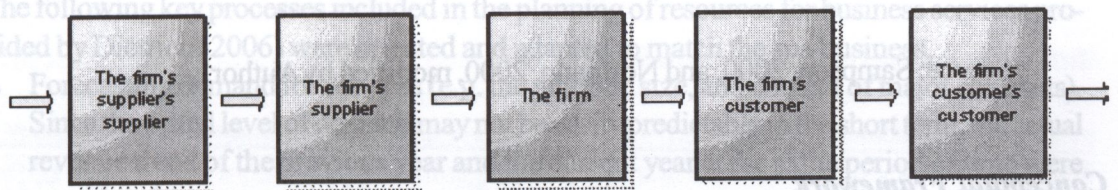
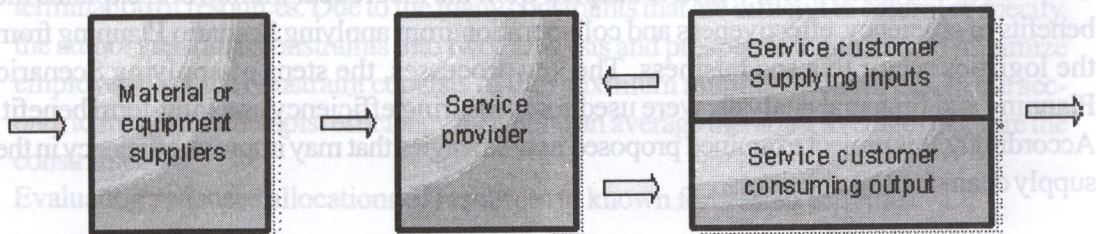
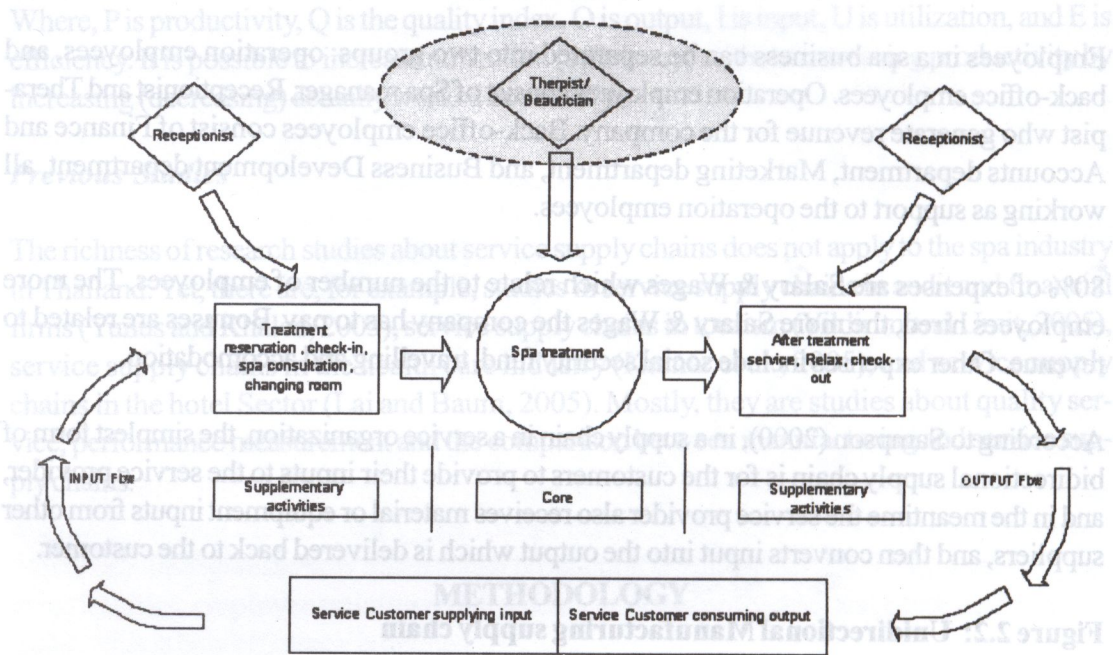


Figure 2.3: Single-level bidirectional supply chain



To present a framework which highlights the reason why we should concentrate on therapist efficiency, in the service supply chain in a spa business in Thailand, we use the single-level bidirectional supply chain framework presented by Sampson (2000) combined with core service presented by Normann (2000) above. These illustrations have been modified to show the supply chain components and business flow within a spa business as shown in Figure 3.1.

Figure 3.1: Spa Business Supply Chain



Source: Sampson, 2000, and Normann, 2000, modified by Author

Conceptual Framework

The conceptual framework, which is adapted from the theoretical framework, explains the benefits of efficiency, effectiveness and collaboration from applying Scenario Planning from the logistics sector to a spa business. The key processes, the steps of applying Scenario Planning and financial analysis, were used for measuring efficiency as a long-term benefit. Accordingly, this project examined proposed new strategies that may improve efficiency in the supply chain for a spa business.

List (2007) stated that Scenario Planning was developed as one of the family of ‘alternative futures’ methods by forecasters who were dissatisfied with the accuracy of conventional sta-

tistical forecasting over periods of more than a few years. Acknowledging that the future is unpredictable, the principle of alternative futures is to develop a number of possible futures in which an organization or other entity might find itself, for consideration of action if that future should eventuate.

Scenario planning was first developed in the 1950s by futurists in the RAND Institute. Herman Kahn is generally accepted as the originator of the method. However, partly due to military secrecy, little was published in this area until the 1970s. Because of this empirical foundation, and perhaps due to the difficulty of applying the academic theoretical foundation of causality to events possibly taking place in the future, theoretical development in this area has not been strong. There was an attempt to construct a theoretical foundation, anchoring futures studies in values, while List (2007) set out a series of principles for anticipating the future; these provide the basis of scenario network mapping.

Method of Research Used

The study is limited to a study of the application of a simulation tool to improve supply chain efficiency, by focusing on therapist efficiency in a Spa Company. Data for analysis comes from a literature review and from in-depth interviews with the target respondents as follows:-

1. Members of a Spa Company, from the operating staff up to management level (Therapist, Spa Manager, Operation Manager, Accounting Manager, Financial Controller) so as to identify the nature of the spa business, and the root cause of problems.
2. Supply Chain Consultant, to be able to apply a logistic and distribution network to therapist relocation.

The following key processes included in the planning of resources for business services provided by Dietrich (2006) were selected and adapted to match the spa business,

- Forecasting demand for services (e.g. the number, size, and content of major contracts). Since the actual level of demand may not be easily predictable in the short term, the actual revenue trend of the previous year and the current year at the same period of time were considered.
- Evaluating costs and determining constraints associated with the acquisition, training, and termination of resources. Due to the many constraints that are difficult to control or specify, the author separated constraints into two: analysis and prospects. In the first, to minimize employee cost, the constraint consists of the maximum number of therapists. In the second, to maximize therapist efficiency by having an average therapist, average hours are the constraints.
- Evaluating proposed allocations of resources to known forecasted activities.

After the key process has been identified, the step of applying Scenario Planning has been followed to find the optimum solution. Simulation has many advantages over using the real

system itself, the basic idea being that the model is a vehicle for asking ‘what if’ questions. This means that the simulation model is subject to known inputs and that the effects that these inputs have on the outputs is noted. Computer simulation is one of several technologies available to improve efficiency, and simulation is often used as a design and/or decision tool in various industries including supply chain systems.

DATA ANALYSIS

Key Efficiency Measurement

Two ways to increase productivity are to reduce the available hours or reduce the head-count of employees. In this paper we focus on how to improve the utilization rate and efficiency rate by reducing overlap time. However, it should be noted that productivity is measured as a physical resource required to produce one unit of output, which does not take the price into account.

Table 4.1 : As-Is Utilization-Efficiency

Utilization-Efficiency	As-Is
Number of Heads	10.22
Available Hrs	79.43
Occupancy Hrs	27.54
Utilization%	34.06
Avg.per therapist(standard hour of work)	2.65
Efficiency%	3.50

Table 4.2: To-Be Utilization-Efficiency

Utilization-Efficiency	Scenario I	Scenario II	Scenario III	Scenario IV
Number of Head	9.22	10.22	10.22	9.22
Available Hrs	79.43	77.43	77.43	77.43
Occupancy Hrs	27.54	27.54	27.54	47.00
Utilization%	34.06	34.99	34.99	60.75
Avg.per therapist(standard hour of work)	2.96	2.65	2.65	5.16
Efficiency%	3.93	3.60	3.60	7.14

Scenario I: Considered by reducing number of heads only

Scenario II: Considered by reducing available hours by two hours from the overlap of time of therapist shift 1 and shift 2 during peak time.

Scenario III: Considered by both reducing the number of heads and reducing available hours by two hours from the overlap of time of therapist shift 1 and shift 2 during peak time.

Scenario VI: Considered by increasing utilization up to 60% as a standard spa business requirement.

It is assumed in this set of experiments that the quality factor specified in this practice is equal to 0.5. The average historical data of occupancy hour, available hour, and revenue generated for the months from January to March 2006 and 2007 are used. The productivity ratio results are illustrated separately, in As-Is productivity and To-Be productivity, in Table 4.3

Table 4.3a: As-Is Productivity

	Jan	Feb	Mar
Revenue Generated per hour	7,200,000	5,600,000	5,333,333
Available hour	75	78	86
	96,000	71,795	62,016
Quality factor	0.50	0.50	0.50
Productivity	48,000	35,897	31,008

Table 4.3b: To-Be productivity

	Jan	Feb	Mar
Revenue Generated	7,200,000	5,600,000	5,333,333
Available hour	77	77	77
	92,987	72,323	68,879
Quality factor	0.50	0.50	0.50
Productivity	46,494	36,162	34,440

The result of the To-Be productivity ratio shows that when revenue generated increases while occupancy hours remain steady, productivity will increase. To increase productivity in the spa business, management has to consider not only cutting the number of staff but putting more effort into the development and training part. It is true that this will increase the proportion of employee cost, but conversely the percentage of productivity increase will show more benefit.

In this study the key efficiency measurements are EER and ERP, of which the employee efficiency ratio (EER) represents a calculation based on gross revenue generation net of controllable cost related to total compensation paid by the enterprise to its employed, and the employee profitability ratio (EPR) represents a calculation of individual employee revenue generation or allocation based on the employees' activity in creating and/or supporting income and their proximity to the income stream measured against their individual variable or fully loaded cost for their activity and effort.

The result represents a quantifiable value of employee to the enterprise and is reconcilable to the enterprise's general ledger operating results.

$$\text{EER} = \frac{\text{Employee wage/benefit/cost}}{\text{Net Revenue}} \times 100$$

$$\text{Net revenue} = (\text{income} - \text{expense}) - (\text{cost-net of employee cost})$$

$$\text{EPR} = \frac{\text{Average P\&L per employee}}{\text{Average revenue per employee}} \times 100$$

$$\text{Average P\&L per employee} = \text{Average revenue per employee} - \text{average cost per employee}$$

Source: <http://www.mgmtsolgrp.com>

These two performance measures, EER & EPR, provide a focused evaluation management methodology and provide additional transparency to show how well management is performing in human capital management.

From historical data, both ratios were calculated to measure the existing efficiency as stated in figure 4.1 and figure 4.2 accordingly:

Figure 4.1: Employee Efficiency Ratio

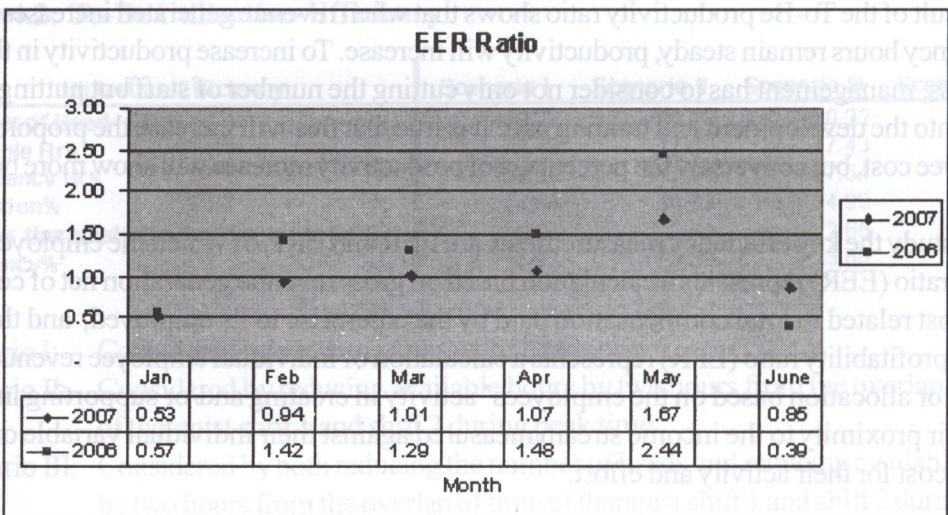
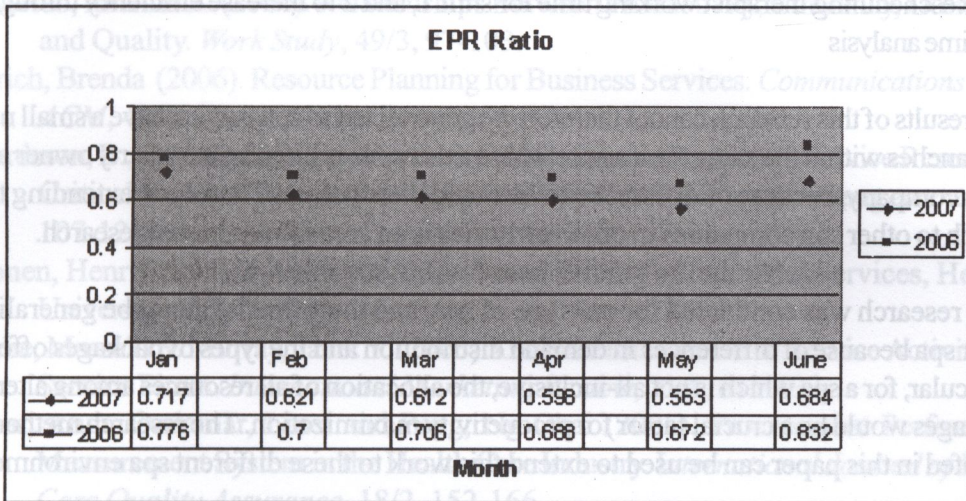


Figure 4.2: Employee Profitability Ratio



The above Figure reveals that the EER and EPR compared over two years show a consistent income decline, along with declining expense and cost, while employee cost continues to rise. The decreased income and expense in the face of greater employee cost is improving the efficiency ratio. It is suspected that the relationship in improvement however is not a conscious management effort, but rather a result of decreasing interest rates (variable income and costs) brought about through economic contraction. If managed then employee cost would decline by a similar percentage for variable items. That however is not the case, and can be validated by the EPR which clearly shows a declining average profitability per employee compared with last year. The EER would be even lower if the income and expense were better managed, and EPR should be increasing. The fluctuation in each month is mainly due to demand fluctuation in each seasonal period.

RESULTS AND RECOMMENDATIONS

Summary of Findings

The result of this study reveals that productivity improvement is more than just cutting staffing levels. Productivity of therapists can be improved both in the short term and long term by:

- Relocating therapists from places that have low revenue or low occupancy hour to places that have higher revenue or higher occupancy hour. The benefits of such relocation are for both the company itself and the therapists, with the company gaining more productivity from the existing number of therapists while the therapists gain more incentive and reduce their waste time

- Providing effective training courses to increase therapist skill in providing greater variety of treatment
- Rescheduling therapist working time for shift 1, and 2 to increase efficiency through peak time analysis

The results of this research cannot therefore be generalized to spas which have a small number of branches within the same territory, or where a therapist is hired by a property owner and not a spa company, because of differences in demand distribution. Therefore, extending this research to other spa companies in other territories is an area for additional research.

This research was conducted for one type of spa, and therefore it cannot be generalized to other spa because of differences in demand distribution and the types of packages offered. In particular, for a spa which is not all-inclusive, the allocation of all resources among alternative packages would be a crucial factor for productivity maximization. The research methodology adopted in this paper can be used to extend this work to these different spa environments.

CONCLUSION

Supply chain efficiency improvement comprises a set of coherent activities designed to enable management to determine, directly or indirectly, how an organizational system is performing - improving or deteriorating, in or out of control - whilst providing information in support of decisions and actions aimed at improving efficiency of the system. This efficiency embraces the things we do to find out how we are performing and decide how we can do better. This paper presents the development of a proposed productivity, efficiency and utilization analysis framework for spa businesses by reviewing various well-known performance measurement frameworks available for the service sector

This study produced positive support for the concept of applying Scenario Planning for supply chain efficiency improvement. However, this conclusion may be incomplete due to limited time and budget. There are many limitations, which can be explained as follow:

- This study may not be complete on in-depth details in some parts such as the technical skills of concerned parties. Moreover, in the utilization-efficiency analysis, we made the assumption that to cut down the number of therapists and re-schedule working time is applicable; but in a real business, there are legal restrictions from the Ministry of Labor on reducing the number of employees without satisfactory reason, and a therapist is not allow to work more than eight hours per day without overtime payment. Therefore, we need a fuller study on other ways of saving cost such as the cost of therapist relocation.
- The project tried to improve/maximize efficiency in terms of occupancy hour productivity by running small simulation testing. It could not run a full simulation testing because of budgetary limitations. Therefore, a full simulation testing program is required before real implementation.

REFERENCES

- Al-Darrab, Ibrahim A. (2000). Relationships Between Productivity, Efficiency, Utilization, and Quality. *Work Study*, 49/3, 97-103.
- Dietrich, Brenda (2006). Resource Planning for Business Services. *Communications of The ACM*, 49/7.
- Edvardsson, B., Gustafsson, A., and Roos, I. (2005), Service Portraits in Service Research: A Critical Review. *International Journal of Service Industry Management*, 16/1, 107-121.
- Hytonen, Henri (2005), A Value for Value-based Pricing of Industrial Services, Helsinki University of Technology.
- Kotabe, Massaki & Murray, Janet Y. (2003). Global Procurement of Service Activities by Service Firms. *International Marketing Review*, 21/6, 615-633.
- Kumar, Arun, Ozdamar, Linet and Peng, Ng Chai (2005). Procurement Performance Measurement System in the Health Care Industry. *International Journal of Health Care Quality Assurance*, 18/2, 152-166.
- Lai, Pei-Chun & Baum, Tom (2005). Just-in-time Labour Supply in the Hotel Sector. *Journal of Employee Relations*, 27/1, 86-102.
- List, Dennis (2007). From Scenario Planning to Scenario Network Mapping. *ECIC University of Adelaide for NZSSES Conference*.
- Normann, Richard (2000). Service Management Strategy and Leadership in Service Business. *West Sussex: John Wiley & Sons*. 3rd edition.
- Perrigot, Rozenn, (2006), Services vs Retail Chains. *International Journal of Retail and Distribution Management*, 34/12.
- Purbey, Shankar; Mukherjee, Kampan and Bhar, Chandan (2007). Reflective Practice: Performance Measurement System for Healthcare Processes. *International Journal of Productivity and Performance Management*, 56/3, 241-251.
- Sampson, Scott E. (2000). Customer-supplier Duality and Bidirectional Supply Chains in Service Organizations. *International Journal of Service Industry Management*, 11/4, 348-364.
- Sengupta, & Kaushik, & Heiser, & Daniel R., & Cook, Lori S. (2006). Manufacturing and Service Supply Chain Performance: A Comparative Analysis. *Journal of Supply Chain Management*.
- Yildirim Yilmaz, & Umit Bititci (2005). Performance measurement in the value chain manufacturing v. tourism. *International Journal of Productivity and Performance measurement*, 55/5, 371-389.
- Yunus Kathawala, & Khaled Abdou (2003). Supply Chain Evaluation in the Service Industry: A Framework Development Compared to Manufacturing. *Journal of Managerial Auditing*, 18/2, 140-149.