



# CHAPTER I

## INTRODUCTION

### 1.1 FRAMEWORK FOR INFORMATION MANAGEMENT

This thesis proposes comparative information management in hospital industry in Thailand, comparing hospital management in managing public healthcare programs, Universal Care (UC), Social Security Fund (SSF), Insurance (IN), Workmen's Compensation Fund (WCF) and Civil Servant Medical Benefit Scheme (CSMBS) offered by governmental authorities (national healthcare authorities) with industrial practices. In essence, the analysis compares and contrasts various industrial practices with the current hospital industry's practices, identified by case study. In which, examines the practice of classifying public healthcare programs' patients in the front reception of the hospital.

Currently, there are no methods to assist the hospital in determining which practice is the best, in term of classifying healthcare patients. Thus, there is a need for comparative framework to evaluate hospital industry's practice based upon attributes of industrial practices; production systems, operations management, and business processes re-engineering (BPR) as to improve efficiency in three areas; efficiency improvement of the front reception, manage quality of healthcare service, and at the same time correctively enhance revenues. This thesis provides comparative framework that evaluates the best practice, and identify through current industrial practices for which it can provide best practice to the hospital. This ensures that the practice can be transformed and standardised into processes and steps, and will be able to implement an ongoing hospital information system: HIS, in a form of regulatory framework (consultation tool) and including block-flows and decision-tree diagrams. The results of this implementation will serve as a stepping stone for development of information system application, as to cope with healthcare complicated regulations and requirements, in term of maximum benefits received. In addition, information and figures on existing condition were collected from a general hospital, Navaminthra 2 Hospital as the case study.

## 1.2 COMPANY BACKGROUND: (Navaminthra 2 Hospital)



The hospital was located in Thonburi and was founded in December of 1986. Initially it was a general polyclinic and had been expanded from one to two main 5-story buildings with current total area over 4,500 square meters. The business office was opened in 1989 and a former company was formed in a year following. It has been licensed with the title of general hospital with the capacity of 100 hospital beds including 15 Intensive Care Beds (ICU). The facility comprises of 3 Operating Rooms (OR), 2 Emergency Rooms (ER), 4 Examining Rooms, X-ray, Laboratory, Nursery, and fully equipped with medical equipment.

The buildings are located on the main street (Suksawat Rd.) in the centre of Ratburana area, with 40 parking spaces and service areas such as canteen, conference, and physical therapy areas. In the present, the hospital is awarded ISO 9001:2000 certificate for operational processes (only medical process) and employment of 200 employees (including full-time/part-time) and has been approved by National Health Security Office (NHSO), Social Security Office (SSO), Comptroller General's Department, and Department of Insurance (DoI) to serve especially the public healthcare programs. The existing condition in serving healthcare patients is as shown in Table 1.1:

<b>Out-Patients Department (OPD):</b>		
General patients are booked <u>monthly</u> in/out via front-reception		
New patients appointments	=	4,572
Old patents appointments	=	10,516
Total OPD	=	<u>13.528</u>
<b>In-Patients Department (IPD):</b>		
General patients are admitted <u>monthly</u> via admission forms <sup>1</sup>		
Accident & Emergency (AE) admission	=	1,844
Waiting-List admission (Non-AE)	=	993
Total IPD	=	<u>2.837</u>
<b>Average Length of Stay (ALOS):</b>		
General patients are discharged <u>monthly</u> via discharge summary (IPD) <sup>2</sup>		
ALOS (include UC and other programs)	=	10-60 Days
Total Patients (OPD & IPD)	=	<u>16.365</u>

**Table 1.1:** Existing Condition Figures (January-March: 2005)

### 1.3 STATEMENT OF THE PROBLEMS: Managerial factors and implications

In the past few years, rising expenses of healthcare in the hospital industry have prompted unprecedented focus on cost and customer relationship management (CRM). Information system management in the hospital through the role of customer services is viewed as an ongoing basis; the idea is very much in the initial stage (Bates, 1999 and Kotler, 2003). As the country economic grows and the customer needs (patients) have become political conflict of interest with the hospital industry, where they need more intensive-care service rather than usual health-oriented service in the past which no one desires to come to the hospital. As well as that, they need longer stay of treatments (Length of Stay: LOS) with highest quality of medical care but under a small payment. Nevertheless, new diseases are being discovered and the life-expectancy has been growing, people are lived longer despite in handicapped condition (Suomi, 2001). This is becoming an issue of increasing importance for Thailand's healthcare service industry.

<sup>1</sup> Admission Forms: see Appendix D

<sup>2</sup> Discharge Summary (IPD): see Appendix C

On top of that, major constant pressure on recent national healthcare reformation, have come at the same time to strongly regulate amounts of cost spent on each patient, as of government intervention to reform the public healthcare system (Tangcharoensathien, 1999). This has created enormous negative impact on hospital's in/out-patient services (IPD/OPD) and revenues of the industry. As it has used a quick approach to uncoordinatedly extend public healthcare, to cover all sector of patient population (Tangcharoensathien, 2003). Due to that, it creates inadequate information and imperfect healthcare market, in which patients simply cannot make their rational choices as they do not have authorisation to choose adequate choices of healthcare programs. As a result, they are increasingly dissatisfied with the quality of healthcare that the hospital industry provides.

Therefore, base on this comparative framework, as for the hospital industry need to sustain its position while also improving quality, solution on information management must be proposed to achieve greater efficiency while coping with variation demands of customers and escalation in healthcare cost containments. The development of current healthcare programs' processes and the classification of the healthcare programs' patients are unquestionably needed. As to response to the government reform by reengineering the healthcare processes up against and in parallel with the government reform. Through substantial hospital information system (HIS) in a form of consultation tool, by transforming from various documents-based healthcare information to aggregated regulatory framework for regular-basis uses. Then, the ongoing management can design standard process and operational framework and identifying what guidelines can be best suited with various types of patients while reducing negative impacts for the industry.

### **Information Environment:**

For the Navaminthra 2 Hospital, environmental pressure must be evaluated and assessed to constitute improvement in adequate quality of healthcare service. However, political pressure on hospital has increased strict regulations and requirements, which lead to change in existing condition of the hospital; PESTEL will be analysed as commence of the problems:

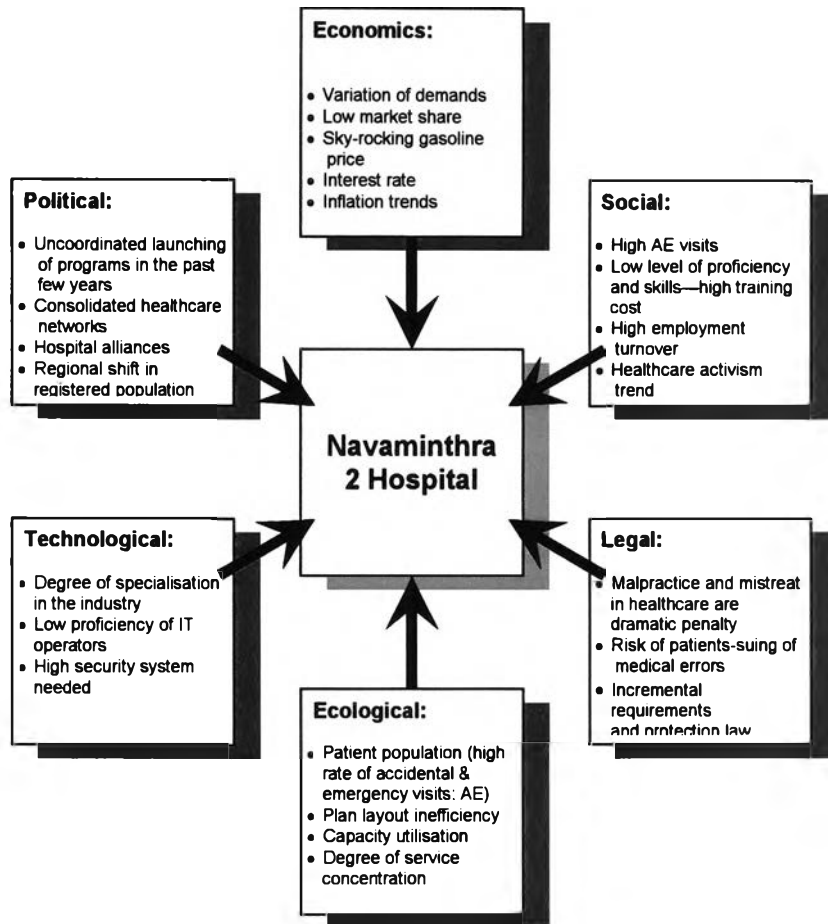
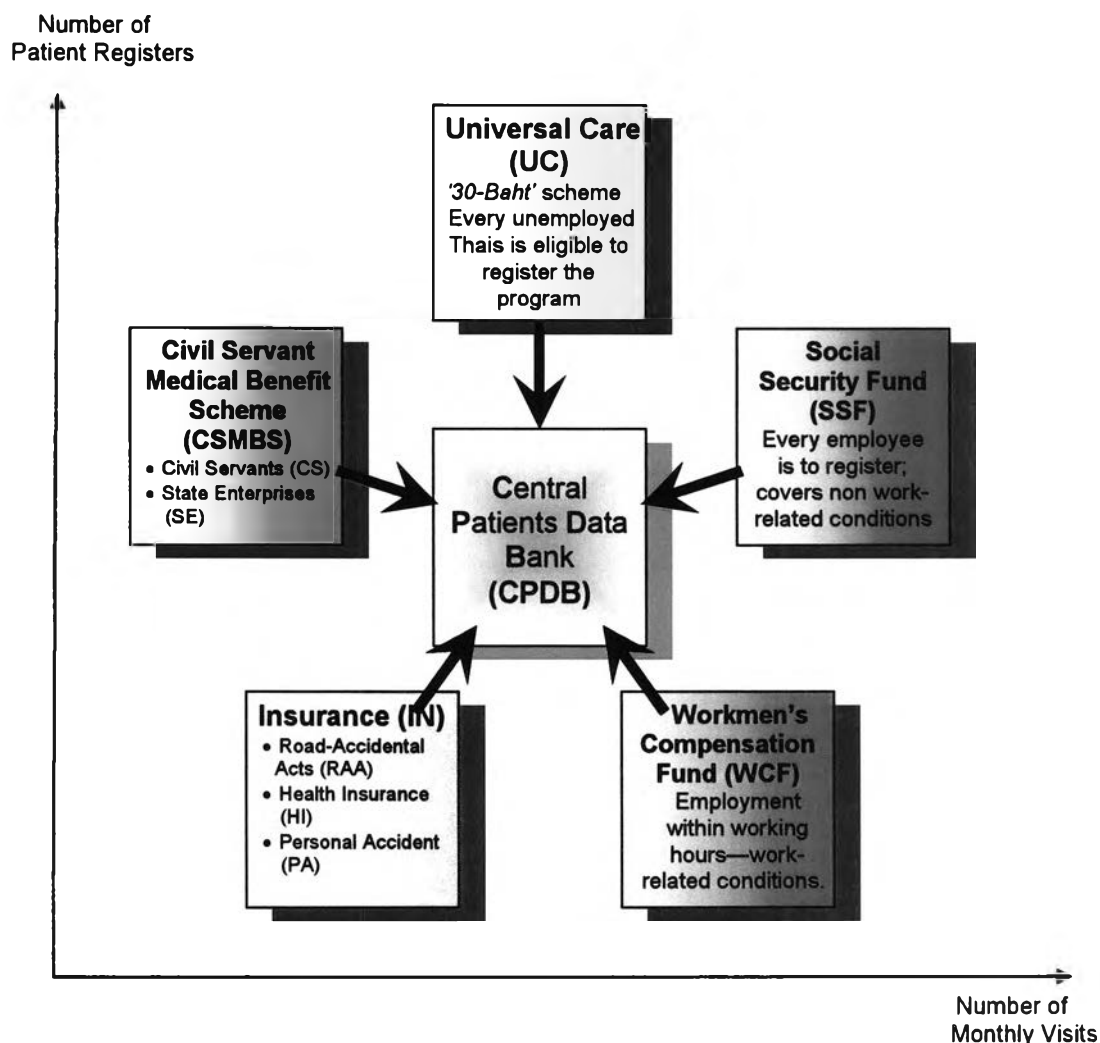


Figure 1.1: PESTEL Analysis

According to various factor considerations and in practice, the hospital has been unable to cope with public healthcare's established regulations and requirements that stipulate highly on medical care Diagnosis-Related Groups: DRGs (Appendix E). While reimbursement rates are fundamentally lower than the total cost-spent on each patient, and also along with number of patient monthly visits on each healthcare program is considerably increasing.

Statistic shows that in the year 2004 alone, there have been 27 private hospitals resigned from the public healthcare provider programs (NHSO, 2004). In which, signify that the existing government incentive system makes the orientation of public healthcare programs a great deal of difficulty. As public healthcare programs make up nearly all of the hospital's services mix, almost every private hospital rely their revenues on these programs (Sreshthaputha, 2001), in which include, Universal Care (UC), Social Security Fund (SSF), Insurance (IN),

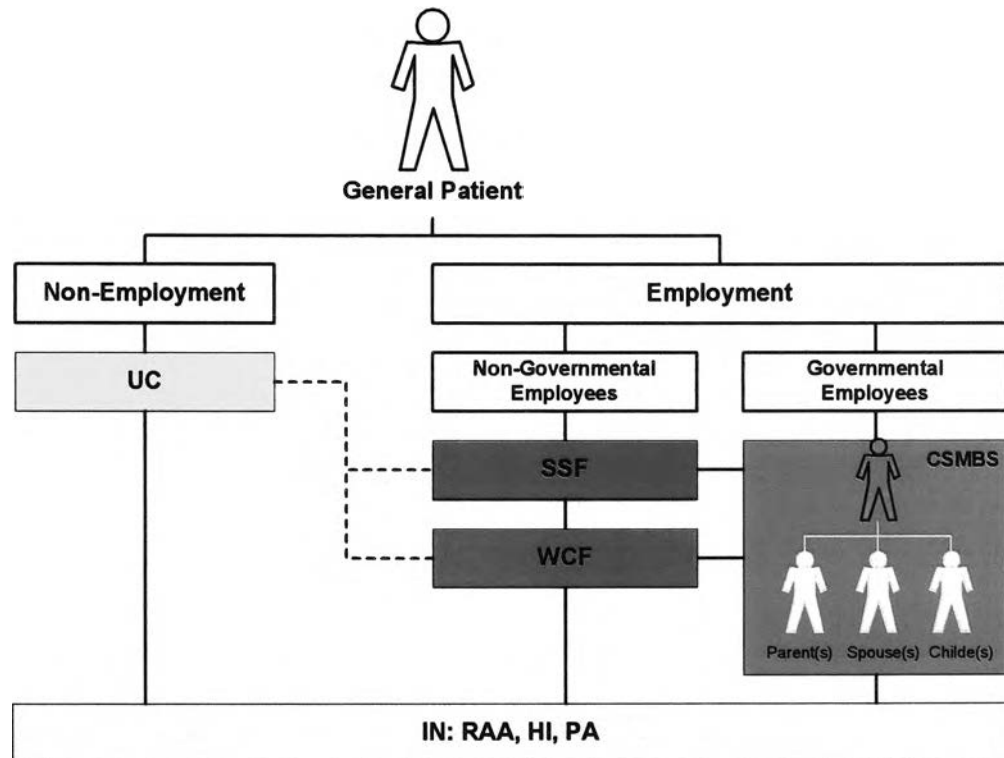
Workmen's Compensation Fund (WCF), and Civil Servant Medical Benefit Scheme (CSMBS); as shown in Figure 1.2:



**Figure 1.2:** Public Healthcare Programs and CPDB; five colours corresponded

Thus, cost containment and hospital's efficiency have become the focus of the hospital industry (Johannesson, 1998). The Navaminthra 2 Hospital is thus, threatened by the escalating of the healthcare costs and the low reimbursement rates. However, there has been no establishment of official program of public healthcare beneficiary (Sriratanaban, 2001), to assign and better serve with patient needs. This thesis intends to present improvement in the area by increasing control over the cost containment by recommending appropriate industrial practices to the healthcare management, while offering maximum patient's benefits. In doing so, proper collection of patient information upon reception must be assessed to include types of

benefit a general patient is entitled to, based upon qualifying condition (contribution's validation), time requirements, location, and patient specific profiles that will provide immediate status in the front reception. Then, this status represents official priorities (national healthcare authorities) of a general patient, sorted by employment, as shown in Figure 1.3:



**Figure 1.3:** General Patient's Priorities (Five colours corresponded to each program)

In practice, a general patient may belong to more than one priority. Generally, this has established multiple priorities for one patient and a fixed flat rate each year for OPD/IPD reimbursement. Due to that, general patients cannot make their rational choices and in other instance, they do not have adequate choices of healthcare service while the healthcare system has not been able to provide equal access and equitable financing schemes. When patients do not exercise their right to choose, they are unlikely to have full information on medical care quality and the responsibility of deciding for which priorities to rationally use, is relied upon one patient's decision. This is fairly adequate if there are just only few healthcare programs and regulations. In this context, common problems occur as existing multiple programs and multiple priorities of patients and thus subsidising across programs (NHSO, 2004). Because of patients regularly change their jobs, their registered regions, and this causes complication in programs' entitlement validation.

In summary of the problem, in most cases, there has been a high magnitude of patients' subsidising across programs as shown:

- i. Subsidising across programs; due to payment method, budget allocation, and urgently incompleting documents.
- ii. Ongoing changes of status of population; jobs, address, birth, death, and accident.
- iii. Regional shifted of registered population; where conflicting with the qualifying periods, while having treated at other than registered hospitals.
- iv. Complicating of programs' regulations and requirements e.g. dissimilation of qualifying conditions and time requirements.

In the meantime, the hospital is motivated to overcharge in order to cross subsidise the programs for profits, when its beneficiaries were faced with no healthcare's price tag (Porter, 1994). Besides, fixed flat rate reimbursement has pressured the hospital to undertreat (malpractice and mistreat) and discharge patients prematurely. Furthermore, there are also loopholes such as, medical staff act as purchasing agents on behalf of their patients by ordering tests or delaying admission (Pannarunothai, 2005). Only the change in incentives from the national healthcare authorities can close the loopholes (many coverage's overlaps and inequities). But in that case, is far beyond the industry's authority. Nevertheless, these compounded problems have happened and resulted on a regular basis in counterbalanced revenues schemes, as shown below:

- 1.) This has created problem of reimbursement complication, as there are many separate authorities of healthcare offices which have different level of authorities in allowing the hospital to reimburse among different treatments. In practice, when the patients decide to use the healthcare service, they usually get denied, the hospital thus have to cross-subsidise patients with revenue from other programs. Where this problem has counterbalanced the hospital industry in term of reimbursement plan, and equally the patient, in term of urgent difficulty in preparing completed documents (e.g. RAA), due to the healthcare benefits are linked with employment status.



2.) As a result of solving complaints, most of the hospitals solve the problem by employing managed-care personnel (medical-care attorneys, in which it is costly) to help negotiate and conveying patients to use other programs instead, in which making patients really unsatisfied, but this method can simple the hospital's reimbursement plan better. This practice has been sustaining in the hospital industry ever since the public healthcare programs exist.

3.) The hospitals, thus, have abused the system by overcharging and falsifying claims; reclassifying non-reimbursable programs to reimbursable program for admission (Pachanee, 2004). For instance, the admission rate of CSMBS is significantly higher than among other programs (Tangcharoensathien, 2003). This is an evident that the CSMBS demands unnecessary admission and longer ALOS, owing to there was no charge for CSMBS admission. As a result, the hospital has incentives to overcharge in order to cross-subsidise the programs used.

For the industrial practice perspective, for regular basis, the hospital has to motivate and merge a range of numerous cases to use hospital's preferred programs where such patients have refused to do so and resulting in being denied from the right to use of designate programs and many other services. Where with hospital practice being aligned with the industrial practice, it would provide access to healthcare information, right to use of designate programs, and eliminate the crossing of programs. This also includes overlaps and gaps between healthcare programs and at the same time introduce standard processes and steps to administer the front reception department. By reduce unnecessary steps of work process as to standardise the processes and steps.

Therefore, to facilitate the need for healthcare adequate information, this comparative framework will redesign effective work processes, steps, and output performance measures, in order to reduce waiting/response time for the hospital's front reception, shorten patient's ALOS, and eliminate unnecessary admission. Then, the regulatory framework must define entitlement, roles, functions, including the processes and steps to claim benefits, with respect to maximum benefits received and quality of healthcare. This will also lead to reducing of overlap, inequity of healthcare service, and cost containment. In addition, the road towards a full

implementation of healthcare practice requires significant areas of improvement as follows:

- Reduce waiting/response time
- Reduce ALOS
- Reduce unnecessary admission (IPD)

#### **1.4 OBJECTIVE:**

Compare hospital management in managing public healthcare programs with industrial practices.

#### **1.5 METHODOLOGY:**

1. Study regulations and requirements of the public healthcare programs
2. Proper collect information on public healthcare patients and prioritise benefit packages of each program's patients, based on patient profiles
3. Identify requirements in term of production planning and control
4. Design block-flow diagrams, decision tree diagram, standard processes as operational framework, and schematics of the CPDB
5. Design and construct the regulatory framework
6. Implement the frameworks and benchmark the result conditions for significant improvement between before and after.
7. Written-up the thesis

#### **1.6 SCOPE OF THE THESIS:**

The scope will be to consider in details of regulations, requirements, and patients priorities where they are overlapped and interconnected and sort out for its maximum benefits packages as to recommend guideline for various types of patients. And establish standard process for each healthcare programs adhering to industrial practices to only the front reception department.

**1.6.1 Front-Reception Department:** Focus on only three workstations; reception, filing room, and gatekeeper nurses. This will concern only classifying input patients (non-medical transactions).

**1.6.2 Project Results:** The results will be derived in a form of regulatory framework and including block-flow diagrams (nodes) and decision tree diagram.

**1.6.3 Project Indicators:** In measuring implementation results, set of question forms concerning on waiting/response time, ALOS, and unnecessary admission will be used in the survey (Appendix B-D). The answers will be reviewed for results condition and to provide benchmarking for significant improvement, by statistical method to compare condition before and after.

**1.6.4 Sources of Information:** The details of regulations and requirements of healthcare programs will be collected from national healthcare authorities and related services as shown:

- 1.) National Health Security Office (NHSO): Ministry of Public Health (MoPH)
- 2.) Social Security Office (SSO): Ministry of Labour (MoL)
- 3.) Comptroller General's Department (CGD): Ministry of Finance (MoF)
- 4.) Department of Insurance (DoI): Ministry of Commerce (MoC)

**1.6.5 Patient Profiles:** A set of 200 patients from within registered area and carry at least two priorities such as SSF, CSMBS, and RAA will be sampled for the response of the healthcare service.

## **1.7 EXPECTED BENEFITS:**

1. Increase efficiency of the front personnel in classifying patient inputs
2. Increase productivity and service; medical processes can be proceed earlier (from front reception throughout the whole process)
3. Reduce transactions, overhead costs, and improve accountability.

And further specific benefits are addressed using SWOT analysis:

<p><b>Strength:</b></p> <ul style="list-style-type: none"> <li>• Provide negotiation assistance (consultation tool) which can help both patients and hospital to be agreed upon (reduce lead-time), toward best beneficiaries. Eliminates medical errors; malpractices, mistreats, and hassle of patients/hospital relationship.</li> <li>• Reduce transactions, waiting/response time, and cost containment. Improve registered queuing and process of paperwork.</li> <li>• Less number of front personnel to cater more patients, especially the AE case.</li> <li>• Enhance revenue, by improving procedures for collections: OPD &amp; IPD billing and patient registration/appointment.</li> </ul>	<p><b>Weakness:</b></p> <ul style="list-style-type: none"> <li>• Pilot program, no existing structure supports.</li> <li>• Rather difficult to make the system adaptable to be accepted by both personnel and patients use, high training cost expected.</li> <li>• Opportunity lost, the hospital can pursue other options based on ROI; expanding on surgical area.</li> </ul>
<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• This will play a better role of the hospital's CRM in term of improve patients satisfaction e.g. cross of schemes, denied, and hassle of services.</li> <li>• This will alleviate burden for the front reception personnel and the insured patients, which collectively enhance revenue throughout the processes and speeds up payments.</li> </ul>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• The initial investment will be large for developing of software/hardware for only the front reception.</li> <li>• External factors of patients: preferred/informed choices.</li> </ul>

Table 1.3: SWOT Analysis

## 1.8 LITERATURE SURVEY:

1.) **Bates, W. D., Pappius, E., Kuperman, J. G., Sittig, D., Burstin, H., Fairchild, D., Brennan, A. T., and Teich, H. J. (1999)**

This paper suggests information system for measuring care by using decision support through making critical pathways available to healthcare providers. It also suggests that healthcare is rising in all parties involved government, hospitals-patients, and insurances are in concerned. Such information can be grouped in different ways and manipulated. Its applications also include computerised outpatients electronic record. And introduce computerised guidelines rather than a time-consuming chart review with large stack of paper which the administration found difficult to evaluate patient information. Critical paths are the tool that has

been used to various healthcare plans for a specific condition. This involves both information display and guidelines to bring decision support to the point of care and ensure that guideline are used.

2.) **Brooks, A. and Zeitz, G. (1999)**

This paper proposes that hospital administrators attempting to implement TQM programs to impart a sense of fairness and correct procedure. Cronbach's reliability coefficients were settled on six TQM dimensions: leadership vision, use of data, patient orientation, training emphasis, policy participation, and task participation to study 507 nurses in 12 hospitals. The used of structural equation modeling (SEM) was set to test the hypotheses. The purpose is to examine role of perceived justice between TQM dimension and organisational commitment. As a result, the TQM dimensions cannot work well without commitment; this includes a psychological feeling of bonding to organisation and desire to treat the organisation's problems as their own.

3.) **Burstin, R. H., Conn, A., Setnik, G., Rucker, W. D., Cleary, D. P., O'neil, C. A., Orav, J.E., Sox, M. C., Brennan, A. T., and Harvard Emergency Department. (1999)**

This research was conducted to determine whether feedback of comparative information was associated with improvement in medical record and patient-based measures of quality in emergency department. And willingness to share care-improvement protocols, discusses potential interventions, and seeks explanations for poor performance. The result came out as benchmark information and subsequent quality improvement efforts led to small improvement in compliance with process-of-care guidelines and patient-reported measure of quality by develop complaint-specific process-of-care criteria using a multi-attribute utility scales. Also, Cronbach coefficients were used to prioritise the scales.

4.) **Gardner, M. R., Pryor, A. T., and Warner, R. H. (1999)**

This paper suggests HELP hospital information system which, collecting patient data needed for clinical decision-making and incorporate a medical knowledge base to assist the clinician in making-decision to a wide variety of areas such as laboratory, nurse charting, radiology, and pharmacy. This system has been

integrated into daily operations of other hospitals in evaluating the purposes of acceptance, feasibility, improvement in patients care, and proving more cost effective program to the hospitals.

5.) **Johannesson, M., Johanson Per-Oluf, and Soderqvist, T. (1998)**

In this paper, a simple model of benefit and costs was used to correspond to a simple model of patients who face a strictly positive probability of treatment within considered time-frame. In welfare theoretical perspective, this has provoked a debate about the design of healthcare systems and the role of the public sector in healthcare to correspond to the system. Also, this model has developed a simple model in order to highlight what kind of benefits and costs are involved at particular healthcare levels. This is used as benchmark against others public healthcare systems.

6.) **Li, Lx. (1997)**

This paper focuses on the internal measure of service quality from the perspective of hospital administrators, which confirms quality management factors that affect hospital service performance. As to establish a system that measure and manage patient care in a way that provides optimal care. To date, there is little empirical effort devoted to quality management in hospitals. A set of relationship between quality management and health quality performance was investigated using a path analytic model. Information/process analysis (IA) was found to rely on a steady flow of accurate information about the processes/programs that generate a hospital's service. Then, proper patients information analysis can provide timely, accurate, and cost effective data to the medical staff in a form that help them make the most informed decisions and take the most rational action. Path analytic model is, in fact, a multivariate analysis method for empirically examine sets of relationship; its model decomposes mathematically the empirical correlations. This overall result suggests that increase in IA for continuous quality improvement makes directly positive affect to health service quality and effectively using advance technology will contribute to hospital service quality. The research instrument was a questionnaire designed to collect data from 492 community hospitals.

7.) **Tsacle, G. E and Aly, A. N. (1996)**

This research describes X-bar, R-chart, P-chart, IC charts, and Individual-X. Total Quality Management/Continuous Quality Improvement (TQM/CQI) More hospitals are becoming to face new challenge and adopt SPC technique to make them more efficient, cost effective and improve overall service quality. The expert system accesses a database to retrieve the minimum numbers of daily hospital admits to calculate the sample size and sampling frequency. Generally, this system will enable healthcare providers to increase the efficiency and effectiveness of process control, reduce the overall cost.

8.) **Dullaghan, D. T. (2000)**

This paper presents a case study of Quorum Health Group, Inc. as one of the top-ten leading healthcare provider group in the United States with many subsidiaries and joint ventures, operating in more than 40 states. With its marketed-oriented and healthcare costs efficiency has made them gone through revolutions of government intervention to regulate (reduce reimbursement rates) healthcare costs, since 1983. They have received revenues from three sources; 46% from Medicare and 47% from Medicaid and 48% from gross patient service. Quorum Health Group provides high-quality healthcare services and increases their revenues by enhancing scope of services, as to manage payers-required and pre-admission authorization, in which has been based on annual fixed-rate reimbursement. The hospital had to certain their average costs per diagnosis-related group, and attempt to lower their cost containment not to exceed the administration's rates. As a result, hospital efficiency to control cost containment became the focus of the group by eliminate unnecessary services (non-profitable) and shorten the patient's length of stay.

9.) **Deming, W. E. (1981-1982)**

Deming (1986) views that the organisation should change from defects detection to defects prevention, form his 5<sup>th</sup> point states that variation should be minimised to preventing defects in the process. He affirms that it could be achieved by effective management through reducing hospital service uncertainty and services process variability, this could solve health services process problems and reduction in its variance which leads to positive influence of healthcare services quality.

10.) **Social Security and Social Health Insurance Schemes.** (2002)

This paper basically addresses the topic of not-well development of Thailand's social security system. As most employment and unemployment are not well covered and have to rely on informal social-safety schemes, as the basic formal system suffers from the weaknesses of limited coverage, unclear structure, and lack of coordination of policies. The Social Security Office (SSO) has been working on to develop and upgrade the system, as to encouraging SSO computerisation, and study on extending social-security typed coverage, and on actuary of old-age pension programs regulation. The current situation has demanded for increasing in more structured bank support, particularly in the area of guideline advice on the future programs, including study feasibility and equity of the programs.