

An Empirical Investigation of Transition Management in Public Healthcare to e-Medicare: A Case Study of Thailand

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Abstract— Authentic appreciation on existing public healthcare services is the first step to develop the neo e-Medicare systems which purpose to resolve and reform the weak points of present public healthcare problems. The research objective aims to transform IT for medical and clinical healthcare efficiency and effectiveness rather than IT for administration management. The researcher instituted the transition model from legacy public healthcare services to public e-Medicare services which constructed stepping stones of procedural guideline development. The research findings help comprehensive understand on actors and indicators which necessitate during processes of e-Medicare transition management. Electronic medical records for medical record exchange of national health information system (NHIS) are presented subject to medical data standards.

Keywords— Decision Support Systems, Electronic Medical Records, Knowledge Management, Transition Management

I. INTRODUCTION

Thailand is one of developing country that always has poverty problems, especially is in public healthcare services and/or e-Medicare. This is national issues that need government administration to focus on these days by introducing reforms or transitions a result-based administration or management by objectives (MBO) of government agency to responsible for public healthcare and e-Medicare. Change believe, political policy

refers a hospital as a service unit that makes all physicians, nurses, and all admin support staffs represent as service providers. It effects to patients to believe the service provider must be obeyed as any conditions as they wish or someone believe the power of money can do anything. Moreover, they will ask for more according to passing a bill that patients can sue the doctor from medical malpractice. What are the rights of doctors, nurses, etc., to protect themselves from unintentional medical malpractice? It is a controversial issue in Thailand right now. The report of The Ministry of Public Health (MOPH) of Thailand that published on web site of WHO: Regional Office for South-East Asia has shown the poverty related problems may be classified into 6 major problem group; problems of vagrants; problems of making a reasonable living; problems of people enticed; problems relating to assisting by ensuring students income from proper jobs; problems of private debts; and other problems. However, they are no points mention about the standards of medical processes, medical practices, and patient information on accuracy; traceability, security; reliability; and availability for poverty country, excepted in developed country such as HIPPA, HL7, DICOM, HA [8], ICD-10, X12, JCI, SNOMED accreditation which are significant changes in e-medical healthcare delivery system.

This research design concentrates on macro-ecosystem that is at hospital's service operations level. It is necessary for reform the public healthcare policy strategy before

breaking into 3 subsystems for transition management of public e-Medicare services.

II. BACKGROUND

Emile [1] defines system transition as a structural change among technologies, procedures, and ecosystems. Transition management performs as primary object to manage metamorphoses towards sustainability. Transitions can be described as “gradual continuous processes of change where the structural character of a society or complex sub-system of society transforms”. Transition management can be classified into the following characteristics [2]:

- long-term thinking for framing short-term policy;
- multi-domain, multi-actor, multi-tier;
- focusing on learning;
- aligning system innovation and system improvement;
- keeping a large number of options open.

They are two conceptual approaches of how transitions materialize. One, literature on transitions utilizes three analytical and heuristic tiers for system innovations. The micro-tier contains unique technologies, in which neo technologies can come into maturity and be developed. The meso-tier embraces a group-work of procedures in a dynamic equilibrium. The macro-tier grasps technical ecosystem landscapes, with global and natural system development. In this formalization stage, transitions transpire when rejuvenations on the micro-tier evolves and is taken up to modify the group-work of procedures and eventually transforms the landscape on the macro-tier [3].

Other, four transition stages are described in the pathway of transformation, as illustrated in Fig. 1.

A stage of predevelopment (1) in one of dynamic equilibrium I. In the take-off stage (2) changing starts to transpire. During the breakthrough stage (3) obvious structural changes have effect. A transition ends with a stabilization stage (4), where speed of transforming decreases and a new dynamic

equilibrium II is accomplished. There are three system indicators are indentified; the time period of a transition; the speed of a transition; and the size of the change.

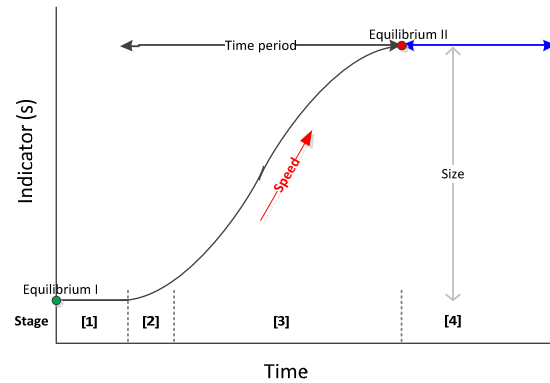


Fig. 1 Stages and indicators in transition procedure

III. METHODOLOGY

Researcher defines a public healthcare system transition as a structural change in three dimensions; technical systems; innovation processes; and social-impact subsystems. 4 public and 4 private hospitals have been observed and investigated on existing processes, IT technologies, patients' satisfaction levels by direct interviews and questionnaires. Each group of hospital was selected; 5 doctors; 5 nurses; 10 admin staff's support; and 20 patients at hotspot. Impact level of hospital transition to e-Medicare purposes to perform mathematical model in term of quantitative analysis. Healthcare transition management model (HTMM) was designed and constructed to guideline as stepping stone for MOPH to consider as standardize for applying as deliver basic healthcare of public hospital service operations in Thailand.

IV. E-MEDICARE MODEL

A. Existing Problems

At present healthcare services of Thailand is defined at the level of less efficiency and effectiveness subject to healthcare, medical services, delay of receiving and sending patient's information, data losses, duplicate patient's information,

and not linkage or integrate patient's information among hospitals. The most common problems of patient before attending medical healthcare are waiting to see physician. From the records of eLeader [4] shown one patient used more than 2 hours for waiting to see the physician or could be a whole day include process to receive medicine and pay a bill.

Moreover, each Thailand's hospital, they are no standards and guidelines for certification; policy, standardize service, control & monitor, treatment procedure, evaluation, and improvement process. Therefore, healthcare reform is required to resolve those problems. The objectives of public healthcare are contributed to all Thai citizen must be received public healthcare as equal, efficiency and accuracy, fairness, equal treatment quality, right process for monitor and control, etc. However, they are no points mention about the standards of medical processes, medical practices, and patient information on accuracy; traceability, security; reliability; and availability for poverty country, excepted in developed country such as HIPPA, HL7, DICOM, HA [8], ICD-10, X12, JCI, SNOMED accreditation which are significant changes in e-medical healthcare delivery system.

Information Technology is widely applying for improving treatment and waiting time. It employs from the beginning such as electronic medical records (EMR) for created patient's data history; patient's history of treatment; and drug allergy; till helps physician to analyze and observe deformation of patient; monitor and control pandemic disease; give an advise on symptom diagnosis from decision support system. It will help to save more life and reduce operations costs.

B. Constraints and Objectives

For determining objectives and constraints, it make clearly in the previous defines goals. According to the design of a system transition this may be even more technical problematic, because factors of socio-technical system and transition process

mostly are related to objectives and constraints. Moreover, objectives and constraints shall be results in measurable performance indicators. However, some constraints are hard to interpretation and measurable especially medical policy standards, internal and external funds, exceptional treatment cases, and attitude of policy makers. The research applies the conceptual model of design process, as seen in Fig. 2, for e-Medicare transformation procedures. The conceptual model of a design process is concentrated on actors and indicators risk management from develop goals to select proper solutions [6]. Indicators defined for system transitions are established on top-down system activities: the time period of a transition; the speed of process transition; and the size of the change, as shown in Fig. 1.

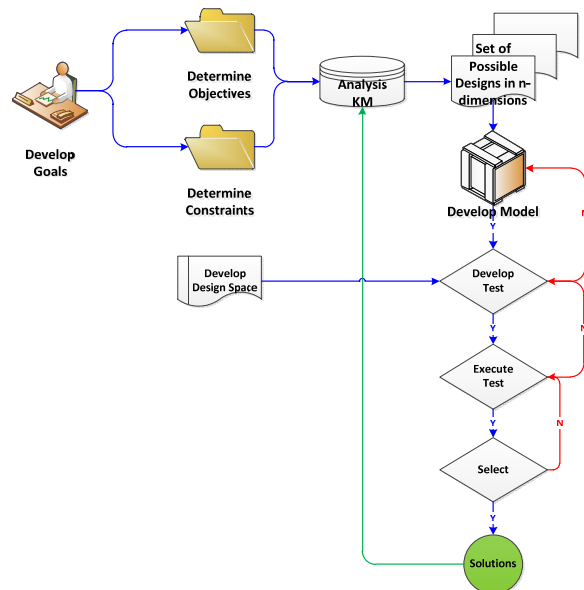


Fig. 2 Conceptual model of a design process

The neo transition of existing publish healthcare services to e-Medicare services needs more appreciate on organization's goal which requires comprehensive conception on organization's objectives and constraints. Each organization has their particular visions and limitations in which differs from organization to organizations.

The researcher purposes the model for help as a guideline for transition process of legacy public healthcare services to e-

Medicare, as demonstrated in Fig. 3. The transition to e-Medicare is recognized with new policies, standards, and regulations for construction the neo reform planning for implementation process. The consequences of change among organization structure, actor behaviors, proper technologies, and expected performance need to be continuous improvement process. Multi dimension indicators: the time period of a transition; the speed of a transition; and the size of the change; necessitate to be contemplated as KPI for measurable and evaluated after the transition process completed from equilibrium (i) to equilibrium (i+1), as illustrated in Fig. 1. The success of transition processes may not happen at the first time of implementation. It may take more time to mature in their reform process. Problem analytical processes are essential for increasing transition completion probability.

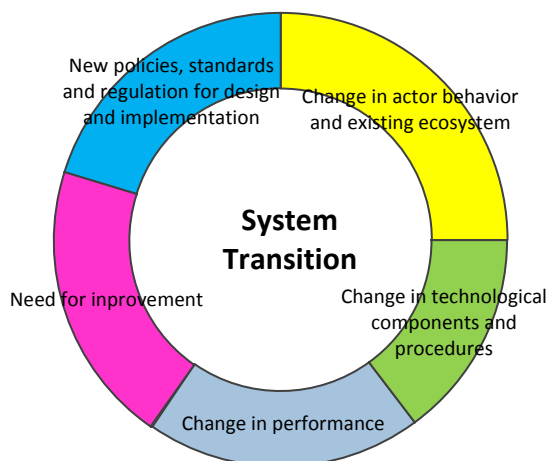


Fig. 3 Healthcare transition management model

The reform decision is an analytic and systematic approach to the investigation of public healthcare transition making. In this research model, researcher presents the mathematical model useful in helping hospitals make the best possible decision and understand the actors which impact on public healthcare transition.

Denotes:

TI: Transition Impact of hospital operations;

R: Resistance of organization [0.1,...,1];

C: Capital requires for transition [1,...,∞]

T: Technological maturity and complexity [0.1,...,1];

S: Standards and regulations that need to comply [0.1,...,1]

Whereby; 0.1 is minimum and 1 is maximum value of each actor.

$$TI = R.C.T.S \quad (1)$$

The value of *TI* from (1) demonstrates the level of impact from hospital transition processes. Actor; *R, T, and S* has control boundary which products of *R, T, and S*; minimum is 0.001 and maximum is 1. The exception actor *C* is independent boundary, it could be from 10,000 baht to many millions baht. Therefore, from research survey shown the huge amount of capital requirement for transition came up with more expectations of changing from equilibrium (i) to equilibrium (i+1), as illustrated in Fig. 1.

C. e-Medicare

The concept of healthcare transition management model (HTMM) is a guideline for transforming traditional healthcare process, normally manual on paper works, to e-Medicare which e-Medicare mostly are involving with digital format and digital communication systems.

The objectives of e-Medicare use for medical are keep and patient's information in form of digital record or electronic medical records (EMR). The purposes of EMR help to reduce miss diagnosis from healthcare treatment for example prescribing, treatment processes, and lab tested results. It helps to reduce treatment error by 80 percent. Moreover it created data based for knowledge management and developed till became decision support systems (DSS).

For Thailand, IT normally uses for hospital administration management rather than apply for increasing medical efficiency and effectiveness or improve medical service quality.

D. e-Medicare and Hospital Information System (HIS)

Healthcare business models are constantly evolving with technology as the healthcare service industry expands. Due to soaring costs hospital needs to control various processes that govern this sector, thus as efficient HIS is necessary. E-Medicare is a comprehensive solution that automates the clinical, administrative and supply chain functions and enables the healthcare providers to improve their operational effectiveness, consequently reducing costs and medical errors, while enhancing quality of care. e-Medicare has reinforced functionality covering prescribing, billing and HR administration, clinical systems, supply chain modules, business intelligent, and decision support systems. The clinical system comprises an EMR with forms the core of the system and links to all other department in the hospital [7]. Moreover, it can exchange patient EMR with other hospitals as well. This helps in providing improved clinical outcomes and better diagnosis and care to patients. For administrative and supply chain sides, it improves productivity and efficiency, driving down costs and waste time.

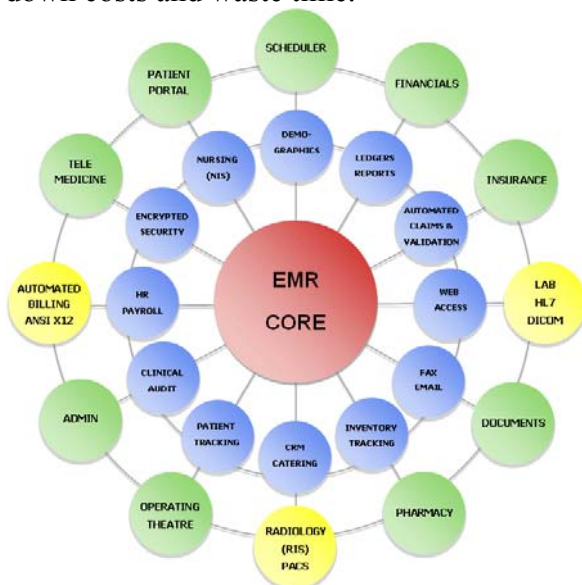


Fig. 4 e-Medicare and HIS [5]

In Fig. 4, the model applies innovation process of electronic medical record (EMR) system to integrate all medical transactions

and centralization it for creating information index library (IIL) or knowledge management (KM). KM is information based for doctors, nurses, medical staffs to utilize classified information for decision support system (DDS) in many medical fields such as RIS/PACS, LIS, prescription systems, billing systems, etc. HTMM aims to solve the problems of poverty and mitigating people's plight subject to bring significant changes in healthcare delivery system by cutting cost and prolific results in long term. The benefits of HTMM came from strategic alliance of public-private partnership (PPP) in term of knowledge and experience transfer that is contribute to patients, health insurance, social security card, and social welfare for cost saving. Since the private firm has the expertise, experience, and incentive to successfully implement highly innovative systems, while accomplishing required performance attributes and risk categorizations. Furthermore, HTMM, it may help to solve a controversial bill subject to forensic science or evidence based for proving who innocent in the court.

When patients' information is online or completed national medical record exchange (NMRE), it helps increase more chance of accuracy and speed for diagnoses and treatments to save more life as the same time increases patient's satisfied level and reduces operations costs.

V. DISCUSSIONS

Transition to e-Medicare in Thailand may take more time for maturity. Since, they are many constraints on: unique public healthcare policy; during developing communication infrastructure; lack of standardize of EMR, lack of EMR governance, laws against misuse of patient's information, maturity of security and privatization of patient's information, lack of enough funds support from government, lack of entire national healthcare system integration, etc.

From survey's results, all hospital subjects, they do not have standards of; electronic medical record (EMR) formats;

national medical record exchange (NMRE); data conversion and migration; standard metadata set for health insurance; and proper security communication systems for private patient's information. Moreover, they are no information integration of patient's data among patient's right, treatment's right, health security, and medical and clinical information that need to exchange among public and private hospitals.

Cooperation among Ministry of Public Health; National Health Security Office; The Institute of Hospital Quality Improvement & Accreditation; National Health Commission Office; and Health Systems Research Institute, needs more proactive master plan in measurable actions and continuous development of the national health direction rather than each organization doing by their owns direction.

VI. CONCLUSIONS

The result findings demonstrated the system transition from the predevelopment or pre-design, take-off or change starts occur, breakthrough or visible structural changes, of healthcare transition management model (HTMM) till new dynamic equilibrium point the resistance of stakeholders reducing dramatically, from phase by phase. For the design phase of system transition this might be even more problematic, because not only the political system but also the transition process is dependent on objectives and constraints. Integration and synconization of information, system integration, and requirements and expectations among patients, IT experts, and medical teams is the key to success of transition mechanism from legacy public healthcare services for to e-Medicare services. Researcher believes that proper design and planning of e-Medicare reform is necessity to accomplish hospital accreditation (HA) requirements [8]. This requires new medical and clinical policies, regulations, organization development, maturity technologies, support funds, and neo vision of corporate strategies. To provide a better support for medical and clinical

treatment, decision support system (DSS) shall be integrated and synchronized throughout national healthcare information systems which will underpin transition management for sustainability.

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