

## **PREFACE**

The ever-rising cost of medical care is a critical issue for policy makers, healthcare providers, insurance companies as well as the patient population. Healthcare System Management (HCSM) is thus an essential tool in today's emerging medical care and patient care system. Hospitals and their authorities, that seek to deploy efficient HCSM system, need to understand the involved human and technology elements in the entire process. With finance and cost-effectiveness in mind, a holistic healthcare delivery system can be extended to an 'affordable healthcare service model' (AHSM). This would constitute a multi-disciplinary approach (vision) involving engineering in hospital setting, in clinical and economic fields. Each of the knowledge disciplines of hospital engineering, clinical engineering and economic engineering has their respective value (intellectual capitals) and role, which needs to be further capitalized, technologized and customized. This multi-disciplinary vision will then take on a new dimension in enhancing healthcare quality.

With these aims, the "healthcare science, technology and econometrics" (STE) infrastructure is able to utilize and enhance the hospital's intellectual knowledge (IK), which hospitals may not even be aware of knowledge assets can be defined as knowledge that a medical / paramedical / non-medical person has with respect to patient care, medical needs, operating environment and technologies. The AHSM needs to acquire and manage this intellectual capital as a managed asset. Indeed, improved medical-care and patient-care are directly proportional to hospital's intellectual knowledge (IK) assets. When IK assets are fully captured and reflected in the organizational mission, strategy, policy, health management and practice at all levels of the hospital management and patient care activities, then we can be assured of cost-effective healthcare delivery.

By utilizing the diverse disciplines of medical technology and biotechnology, bioinformatics and information technology (IT), financial engineering and econometrics, hospitals that can manage their knowledge assets effectively, to gain improved return on investment, higher satisfaction index, cycle time reduction, cost reduction, and through it all better medical outcomes with management satisfaction.

At this point, we would like to introduce yet another model of Ministry of Health (MOH) budget development. For this purpose, a community needs to have good epidemiological data on disease status. Then, the MOH needs to decide the level-of-care (as the model output) based on the acceptable provision quality-of-life and longevity, as well as its economic impact. From that, the cost of this level of healthcare is determined as the model input.

Now the model transfer-function (MTF) comprises the resources to be allocated to primary, secondary and tertiary care. For implementation into the budget input, the MTF resource package determines the output. This actual output is compared with the expected output, and the error is employed as an added resource feedback to the MOH budget-development model.

Hence, healthcare policy (in terms of the budget allocation) constitutes the climax activity of the field of healthcare management. All of the earlier mentioned concepts of AHSM, STE, hospital IK are involved in deciding (i) the desired and acceptable level of healthcare for the community and people, and (ii) the cost of a desired level of health services.

Guest Editors

Khong Poh Wah and Dhanjoo Ghista

School of Mechanical & Production Engineering

Nanyang Technological University