Healthcare Innovation

by

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Introduction

The entire value chain in healthcare includes:

- The producers of healthcare products and services
- The providers of healthcare services (hospitals, pharmacies, physicians etc), and
- The individuals and institutions that purchase healthcare.

Two sets of intermediaries separate these key actors: those firms who finance healthcare (offer insurance to the purchasers and handle reimbursement to the providers) and those who distribute products from the producers to the providers (like wholesalers).

The major producer sectors within healthcare are the pharmaceutical & biotechnology manufacturer sector, the medical device sector and the information technology sector.

The market structure within healthcare is complex and include a categorisation of customers into at least consumers (patients), prescribers (medical doctors) and payers.

Health care systems may be public or private or a combination of the two and they are conducted at different healthcare organizational levels (such as the state, regions and municipalities).

Healthcare IT applications have become increasingly important over the years and include the electronic medical record, diagnostic applications, clinical genetics, digital radiology, remote monitoring, and different modalities including wearables, smart house and implantable devices.

There are different specific themes to address in healthcare including:
- Healthcare systems and the context of health of policy
- Health economics: markets and health policy
- Patient perspectives and doctor-patient interactions
- Healthcare innovations in performance and quality management
- Healthcare equity
- Healthcare networks and teams
- Future challenges and the need for innovation

There are different types of pressures for innovation in healthcare.

Some relate to demography and ageing societies:
- More people living longer
- Increasing number of people with one or more chronic care needs
- Migration and new disease patterns

Some relate to culture and changing expectations:
- From solidarity to individualism
- Empowered by knowledge
- Weakened authority of professionals and bureaucratic decision makers

Some relate to economic pressures:
- Increasing health expenditures in all countries
- Stagnating economies since 2007
- High foreign debt burden in many countries

There is thus a need for innovation in healthcare targeting determinants of health and improving on healthcare systems (including integration of care across care levels).

The need for innovation may address:
- Decision structures in healthcare and mechanisms for inclusion of relevant stakeholders in a process of finding legitimate and efficient solutions for regulating and delivering health care.
- Optimizing healthcare in light of limited resources

Healthcare may be provided by the public (tax based) or by market-driven private organisations including private insurance companies.
The public is financing 75% or more of total health expenditures in Europe, while public financing is financing half of the total health expenditures in the United States.

Types of healthcare funding include:
- Taxes
- Social health insurance
- Private health insurance
- Customer out-of-pocket payments at point of care
- Private donations
- Etc.

Technology trends, demographics, economic pressures and culture drive mega-trends in healthcare.

Technology trends include:
- Gamifying health
- Augmented reality and virtual reality
- Telemedicine and remote care
- Surgical and humanoid robots
- Genomics and personalized medicine
- Body sensors
- Portable diagnostics
- Stem cells
- Lab grown food
- 3D printing of body parts
- Exoskeletons and prosthetics
- Artificial intelligence for medical decision making
- Nanorobots
- Neuro-enhancement
- Big data

Ethnographic methods may be used to assess the different needs in healthcare.

New innovation undergoes health technology assessment in order to assess the need for the innovation.
Health technology assessment (HTA) is a multidisciplinary process that summarises information about the medical, social, economic, and ethical issues related to the use of a health technology in a systematic, transparent, unbiased, robust manner. HTA support healthcare policies that are patient focused and seek to achieve best value.

HTA includes clinical assessments, economic assessments, patient assessments, and organizational assessments.

National systems for HTA vary greatly in complexity and detail, particular when account is taken of how concepts are applied in practice over time to decisions on access, reimbursement and pricing over the market life cycle. Clinical expert opinions and budget impact are being assessed.

All stakeholders support patient access to beneficial therapies. Patients and physicians want effective and safe treatment options. Regulators want to ensure decisions are real world relevant. Industry want integrated drug development and transparent healthcare decisions and HTA institutions want better data to support decision making.

A number of organisations are active in healthcare. They may be characterized by their
- **Task** (the organizations raisons d'etre)
- **Structure** (systems of authority, work flow and communication)
- **Technology** (problem-solving interventions, tools, programmes)
- **Actors/people** (nature, number, motivation, attitudes)

Healthcare organisations may establish different networks in order to operate efficiently.

The institutional environment includes: laws, policies, standards, norms, values, public opinion and concerns about the future, crisis, opportunities, markets.

Problem-solving may be conducted according to the following process:

- Problem and context analyses;
- The design of the solution for the business problem;
- The design of the change process needed to realize that solution in new or adapted roles and procedures;
- The development of organizational support for solution and change plan; and
- The evaluation of outcomes and reflection on the problem-solving process.

Innovation is undertaken at different levels, architectural innovation or component innovation which have a different impact on the healthcare organisations. A component innovation entails changes to one or more components of a product system without significantly affecting the overall design, for example, a hearing aid or a sensor. An architectural innovation entails changing the overall design of the system or the ways different things are put together into a whole system. Examples might be a motor car, a mobile phone business and the design of a hospital department. Most architectural innovations require changes in the underlying components also. Some healthcare innovations may be harder to categorise like innovations to increase patient motivation for doing certain health-improving activities.

There are common problems of implementation of innovation in healthcare which includes the gab between clinical guidelines/quality measures/innovations and clinical practice**.** Value capture is another challenge for innovators in healthcare.

Other important healthcare topics include the importance of organisational practices, social inequity in healthcare and sustainability in healthcare.

Typical innovation concepts and models being used in healthcare innovation are the sweet spot, Porter´s five forces, PESTEL and the business model canvas.
Market concepts include Customer segmentation, stakeholder engagement, buying criteria, features and benefit analysis and finally positioning in terms of price and quality.

Healthcare goals may change in future impacted by different trends. Healthcare goals relate to both physical functioning (from frailty to health) and mental functioning (from apathy to vitality).