Service Innovation Policy in Taiwan: The Case of e-Healthcare in ITAS

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Introduction

A Closer Look at Service Innovation and Exports

Business Concepts of Systemic Service Innovations in e-Healthcare

An Evaluation of the Innovation Result

Lessons Learned
1. Introduction (1/2)

- Service innovation: Top on policy agenda in Taiwan over the last decade, with two focal directions
  - Technology-based service innovation, often supported by R&D programs
  - Internationalization of the service sector, aiming at exports of services
- Since 2006, Department of Industrial Technology (DoIT), the R&D funding agency at the Ministry of Economic Affairs (MOEA) started promoting technology-based service innovation.
  - e-healthcare, financial, logistics services.. etc.
- DoIT’s innovative e-healthcare programs, funded via the Innovative Technology Application and Service Program (ITAS)
  - e-healthcare services for the elderly (U-Care), people with chronic diseases, wellbeing services for the elderly
  - By nature, systemic service innovation, with an aim to promote Taiwan as a testbed for innovative services
1. Introduction (2/2)

- A basic difference between medical care and e-healthcare
  - Medical care: inside-out; patients in need of immediate medical attention approaching medical experts for professional consultations and treatments
  - e-healthcare: outside-in; with new technologies and platforms for medical experts to outreach and take care of the customer/cared living and behaving outside the medical premises

- The purpose of presentation
  - To distill lessons learned from the R&D program funding e-healthcare service innovation
  - To address knowledge gap of policy design for service innovation
2. A Closer Look at Service Innovation and Exports
Dual Roles of Services in the Economy

The role of service in economic development

- An essential part of individual’s daily life and the firm’s routine operations
- Influenced by the income level, living standards and the social norm (ex. tipping in the USA)

(All entities need services throughout their life span)

- Changes in life style
  - Marketization of non-market activities, new intermediaries (broadly-defined outsourcing)
  - Product servicizing (ex. B&B)
- New technologies and brand new services (ex. e-healthcare)
- Regulations, de-regulations and new business models (ex. telecom liberalization)
- Injection of external demand (ex. BOP offshoring, international tourism)

A supporter of the economy

A driver of the economy

Policy to deal with the regulatory regime and the demand side is essential
Many service innovations, esp. technology-based service innovations often lead to differentiation and new market segments in the marketplace, which are still subject to the constraint of a country’s market ceiling.

- Differentiation likely to bringing about limited gains to the economy, because of different market segments replacing each other
- Policy to enlarge the market and channel external demand is essential.

**Internationalization of service vs. exports of services**
- Exports of services good for whom?
  - Good for the firm and person involved? or the economy?
  - Imports of services not that bad for the economy; ex. no international financial centers based only on domestic firms

**“Know-how Gap” of service innovation**
- “Build-a-system” instead of “Build-a-service”
- Knowledge gap of policy design for service innovation
Systemic Service Innovations and e-Healthcare

- Systemic service innovations: A specific type of service innovations
  - By nature requiring interrelated changes in product design, supplier management, information technology (IT), and so on
  - One challenge: the interdisciplinary nature of service, integrating technology, business, social and client (demand) innovations
    - Healthcare and e-healthcare

- Systemic services innovations requiring dealing with more external conditions to the firm involved than do the traditional manufacturing and autonomous service innovations
  - Often involving multi-stakeholders, playing different roles

- DoIT as a promoter, but the Ministry of the Interior (MOI) and the Department of Health (DOH) as the key “owner” and market cultivator of innovative healthcare services
A Longitudinal View on Service Exports: Results of Mixed Modes of Trade in Services

- **Four modes of trade in services**
  - Mode 1: Cross border trade, Mode 2: Consumption abroad, Mode 3: Commercial presence, and Mode 4: Presence of natural persons
  - Not exports in traditional sense as trade in goods, but involving cross-border flows of investment, persons and consumption power

<table>
<thead>
<tr>
<th>Case</th>
<th>The developmental process, involving <strong>a combination of multi-modes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BOP service exports in India</td>
<td>MNCs’ software outposts and R&amp;D centers in India (Import of Mode 3) → Onsite services by Indian software engineers (Export of Mode 4) → Offsite services via ICT platforms (Export of Mode 1) → Outreach to other foreign market by investment, ex. in China (Export of Mode 3)</td>
</tr>
<tr>
<td>Tourism exports in Sanya, China (三亚)</td>
<td>Government promotion (Industrial development) → Investment by international chain hotels (Import of Mode 3) and recruitment of foreign tourism professionals (Import of mode 4) → Flocking-in of external and foreign tourists (Exports of Mode 2)</td>
</tr>
<tr>
<td>Higher education exports in Singapore</td>
<td>Government policy to strengthen the quality and competitiveness of HEIs (Industrial development) → De-regulations to recruit foreign students (Export of Mode 2) → Offshore campus in Singapore established by internationally leading universities (Import of Mode 3) and lecture given in Singapore by foreign professors (Import of Mode 4) → More foreign students to study in Singapore (Export of Mode 2)</td>
</tr>
<tr>
<td>Mode</td>
<td>Export</td>
</tr>
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</tbody>
</table>
| Mode 1: Cross border trade | • Domestic production of services  
• Revenues gained from cross border trade | • Fees paid and remitted out |
| Mode 2: Consumption abroad | • Domestic production of services  
• Domestic consumption by foreigners | • Foreign consumption by nationals |
| Mode 3: Commercial presence | • Domestic service firms’ outward investment, franchising or licensing  
• Limited domestic job creation and exports (except for Thailand’s model of Kitchen of the World)  
• Royalties received: depending on the way of franchising and licensing | • Foreign service firms’ inward investment, franchising or licensing (7-11 at the early days)  
• Local sourcing the material and personnel required  
• Royalties paid: depending on the way of franchising and licensing |
| Mode 4: Presence of natural persons | • Short stay: Revenues gained from service provisions (Flying Surgeons on Weekends)  
• Long stay: Brain drain? Foreign consumption by nationals | • Short stay: Fees paid and remitted out  
• Long stay: Brain gains? Domestic consumption by foreigners |
The Basic Framework

- Still puzzling for the practitioners to start with a good and meaningful service concept and value proposition that can effectively address thorny problems of the clients, with “pain-relief” or “moment of truth”

- “Build-a-service” vs. “build-a-system”

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<th>States to Be Dealt with</th>
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<tbody>
<tr>
<td>People/Human</td>
</tr>
<tr>
<td>Direct Demand: B2C</td>
</tr>
<tr>
<td>Direct + Derived Demand: B2C2C; B2B2C</td>
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</table>

Customer Space
A few Cases

- Secom Taiwan and Mycaso e-Healthcare Services
  - A leading home and business security service provider to diversify into e-healthcare business

- Chang Gung Health and Culture Village and e-Healthcare Services in Nursing Home Complex
  - To make the residents to enjoy comfortable and healthy lives with a variety of health promotion means

- Chu Shang Show Chwan Hospital and Community-based B2B2C Telecare Service
  - e-healthcare services in an inland hilly and agriculture-based county with many widespread villages, some of them even without clinic services

- Cheng Hsin General Hospital and Telecardiology Services
  - e-healthcare services finally focusing on those with acute diseases and illness, rather than the need of people with chronic diseases, as initially planned
A Service Model of B2B2C Telecare Service

Service provider B

Community B

Elderly residents C

Telecare Center

Co. G

Univ. N

Co. T

Co-development & operations

healthcare information

emergency notice

vital sign

temples

community hotspots

family members

healthcare

cash flows (equipment, service charges)

records of healthcare

Source: Chu Shang Show Chwan Hospita (2011).
## A Summary of the Business Concept of the Case Studies (1/4)

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<th>Company Case</th>
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<tr>
<td><strong>S Company</strong></td>
<td><strong>B2C (B2C2C):</strong> Supporting elderly people’s daily lives from living room to downtown and all the spaces in between</td>
<td><strong>People/Human:</strong> Physical and even mental needs of the elderly at home; <strong>Timing:</strong> Accidents and emergency; <strong>Location:</strong> Positioning of the place where an accidents and/or emergency takes place; <strong>Information:</strong> Vital signs of the elderly at home and on road; <strong>Goods:</strong> Home security</td>
</tr>
<tr>
<td><strong>B2B2C:</strong> Partnership with hospitals, real estate developers</td>
<td></td>
<td></td>
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**To decouple its e-healthcare services from security systems and services**
### A Summary of the Business Concept of the Case Studies (2/4)

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<td>C Company</td>
<td>B2C: For the residents to enjoy comfortable and healthy lives with a variety of health promotion means</td>
<td>Physical and mental needs of the residents</td>
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### A Summary of the Business Concept of the Case Studies (3/4)

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<tr>
<td><strong>S Hospital</strong></td>
<td><strong>B2B2C: Community-based healthcare for ageing in place</strong></td>
<td><strong>People/Human</strong></td>
</tr>
<tr>
<td></td>
<td>The local temples and Farmer’s Associations customer relationships with the local elderly</td>
<td><strong>Timing</strong></td>
</tr>
<tr>
<td></td>
<td>First timing for accidents and emergency at home</td>
<td><strong>Location</strong></td>
</tr>
<tr>
<td></td>
<td>Emergency assistance services to home</td>
<td><strong>Information</strong></td>
</tr>
<tr>
<td></td>
<td>Vital signs of local elderly, collected at community hotspots</td>
<td><strong>Goods</strong></td>
</tr>
<tr>
<td><strong>B2C: Self-paid community-based e-healthcare</strong></td>
<td>Addicted users of the existing services; local elderly with reduced mobility</td>
<td></td>
</tr>
</tbody>
</table>
### A Summary of the Business Concept of the Case Studies (4/4)

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<tr>
<td>C Hospital</td>
<td></td>
<td>People/Human</td>
</tr>
<tr>
<td></td>
<td>B2C: First timing, right diagnosis and treatment for acute heart diseases and illness</td>
<td>People with chronic heart diseases developing acute illness and symptoms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Timing</td>
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<tr>
<td></td>
<td></td>
<td>First timing for acute heart diseases and illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emergency mechanism on spot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abnormal signs indicating acute heart diseases and illness</td>
</tr>
<tr>
<td></td>
<td>B2B2C: Partnership with insurance companies</td>
<td>Insurance companies to manage customer relationships with the insured and lessen financial burden of insurance benefits</td>
</tr>
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</table>

Source: The authors.
On surface, e-healthcare services have to address the needs of the cared, but the business concept at issue can involve third parties who are to pay for the services on behalf of the service recipients.

When changing business concept from one type to another, the focal firms often have to reconfigure their business models.

- Inter-organizational relationships in capabilities and core competencies can influence organizational boundaries and hence the business model involved in forging systemic service innovations.
The needs of the cared may have different shades of meanings, in terms of value proposition.

- “Nice-to-have” vs. “had-better-have” (if not “must-have”)
  - “Had-better-have”, against the odds of “what-if”, more attractive and meaningful in formulating value proposition
- Differences between these patterns imply such issues as to how crucial the service is to the users and customers and their willingness to pay.

- e-healthcare services have to deal with a wide range of “states” simultaneously in a way consistent with the proposed value propositions.
- In doing so, the existing core competence of the service provider can be an important asset.
### Some Key Issues for the Formation of the Service Concept of e-Healthcare

<table>
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<tr>
<th>People/Human</th>
<th>Timing</th>
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<th>Information</th>
<th>Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ What is at stake for the targeted customers, in terms of health and wellbeing matters?</td>
<td>■ How to identify and activate intervention at first and right timing?</td>
<td>■ Where is the appropriate location and space for the cared to receive e-healthcare services?</td>
<td>■ What information is essential to the wellbeing of e-healthcare service recipients?</td>
<td>■ What material goods are essential to the wellbeing of e-healthcare service recipients?</td>
</tr>
<tr>
<td>■ What does the wellbeing of e-healthcare service recipients mean to those who may be willing to pay for the services?</td>
<td>■ How to deliver services in a timely and location-specific way?</td>
<td>■ How to pinpoint the location where a critical event concerning the wellbeing of the cared occurs?</td>
<td>■ What data is to be collected and processed for better diagnosis and treatment?</td>
<td>■ How to serve and outreach e-healthcare service recipients in a user-friendly way?</td>
</tr>
</tbody>
</table>

Source: The authors.
4. An Evaluation of the Innovation Result
A Multi-Stakeholder Approach

Still in operation

System (software)

Institution for Information Industry (System)

Blood Glucose monitoring device

TaiDoc Technology (manufacturer)

IS

S1

Chang-Hua Christian Hospital (Service)

MOH Distance Care Replication project

MOH e-HealthCare expansion project

MOE Healthy Life Project

2.4 mil

8.9 mil

150k

200 patients

180k

Clients (during)

• 2.292 patients

• 2.06 mil

Clients (after)

MOH Distance Care Replication project

MOH e-HealthCare expansion project

MOE Healthy Life Project

2009

Qista (Manufacturer)

Apex Bio (manufacturer)

2010

Roche (Manufacturer)

S2

Lu-gang Christian Hospital (Service)
A Summary of the Multi-stakeholder Involved and the Innovation Process

- **Existing/New Product**
  - **OU**
  - **Technology/Product Dissemination**

- **Other Technology Users (Service Provider)**
  - **S1**
  - **Medical/Healthcare Service Provider** (Technology User, Service Provider, System Integrator)

- **E1** Consumer
- **E2** Consumer

- **B2B2C**

- **IS** Information System/Platform Provider (Technology Provider, Service Provider)

- **M** Manufacturer (Medical Device) (Device provider, Manufacturer)

- **C** Communication Device/System (Technology provider, Service Provider)

- **S2**

- **I** Intermediary/Collaboration Service Provider

- **B2C**
The Outcome and Impact: The Perspective of the Service Providers

Objective

Strengthening Service Integration

Improving service Quality

Expanding Service Area

Improving Service Efficiency

Establish Closer client relationship

Technology/Product Source

Transaction Based

From cooperating firm (existing product)

purchase existing product (no cooperation)

from cooperating firm (tailor-made)

New Product Development

From cooperating firm (tailor-made)

No. of firms providing breakeven estimation (average 2.89yrs)

Positive Influence to other departments

Additional team members

Dissemination

Continue Operation

According to the service provided

Income

Fixed monthly fee

Major form of income

Free of charge

Others

Others

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14

□浮動費用 (依服
務量收費)

□固定費用 (月費
制)

□無

□其他計費方式

Others

0
1
2
3
4
5
6
7
8
9
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11
12
13
14
The Outcome and Impact: The Perspective of the Hardware and Information System Providers

**Objective**

- Continuously providing services to project leading firm after project ends: 46.15% (6/13)
  - Manufacturer: 42.86% (3/7)
  - System provider: 14.29% (1/7)
  - Communication: 0%
  - Total Solution provider: 28.57% (2/7)
- Spillover: 38.46% (5/13)
  - Manufacturer: 30% (1/5)
  - System Provider: 40% (2/5)
  - Communication: 0%
  - Total Solution Provider: 40% (2/5)
- Positive influence on other departments: 10 projects (76.92%)
- Development of new product: 12 projects

**Income**

- According to the service provided
- Project Cooperation Funding (Fixed amount)

**What does the information tell us?**

- Characteristic of each type of participating firm (with respect to the product/service provided)
- Market Strategy for each type of participating firm
- Is the project really promoting innovating among participating firms
5. Lessons Learned (1/2)

- Innovative services deal with not only goods, people and information, but also timing and location.
  - Not separately but simultaneously
    - e-healthcare service innovation more than the collection and monitoring of physical and medical information (vital signs)
    - To put yourselves (medical professionals) in the customer’s shoes
  - How crucial the service is? Willingness to pay
    - Diabetes: Changhua Christian Hospital; Heart disease: Cheng Hsin General Hospital (acute vs. chronic)
    - Discharged seriously-ill inpatients’ recovery at home: NTU Hospital

- Demand for healthcare services: Direct demand and “derived” demand; Who is to pay?
  - C2B2C: Sons/daughters pay for their parents
  - B2B2C: Insurance company pays for the insured; non-profit temples pay for neighboring elderly residents (Chu Shang Show Chwan Hospital)
5. Lessons Learned (2/2)

- To cope with or bypass digital divide of generation
  - Chu Shang Show Chwan Hospital: Local temples and community centers as the place for the local elderly to access e-healthcare, with help of trained personnel
  - Chang Gung Health and Culture Village: Targeting well-educated middle-class residing elderly within a well-secure nursing home

- User-tested prototypes need to find way to scale up and scale out
  - To be facilitated by the Ministry of the Interior (MOI) and the Department of Health (DOH) as the key “owner” and market cultivator of innovative healthcare services
  - The “i236 Program”, based on living lab concept as means for their scaling-up
Proposed Tasks of PO for DoIT’s Systemic Service Innovation Programs

- To strengthen networking; more than just R&D funding

MOEA’s Service Innovation Strategy

- Evaluation, Adjustment
- Communication, Coordination
- Implementation, Documentation

Platform for Mutual Learning and Networking

- Tools, Service Model Design
- KIBS, Academia
- Project Reviewers
- Networking Governance
- Sharing of Best Practices
- New Service Design
- Demo & Promotion
- User Involvement & Feedback
- The Firms Involved

Regulatory changes
- Ex post Evaluation
- Scale-up mechanism
- Inter-ministrial coordination

CIER
Thank you for your Attention