Innovation in Korea

Sung Joo Bae

Associate Professor
Management of Technology
Yonsei University Business School

Special thanks to Jae Hak Kim, the director of Innovation Design Center of AMC for sharing their presentation material.
My past 17 years...
Published/Ongoing Research

■ Product Development/Evaluation/Use


“Learning at the Boundary of the Firm: What Happens between Learning-by-Doing and Learning-by-Using” (with M. Rhee)


“Creativity in Groups Based on Problem-Solving Perspective: An Empirical Study,” (with K. Lee and S. Park) East and West Studies, 25(2), 2013

“Problem-Solving Process with the Users: An Exploratory Case Study in the Early-Stage Game Company,” (with A. Oda and S. Park) Yonsei Business Review. 50(1), 2013
Published/Ongoing Research

■ R&D Management/Policy


“The Role of Diversity in Internalization of R&D Outsourcing: An Empirical Study" (with S. Han)

“Two facets of Corporate Funding: Direct and Indirect Effects of Corporate Involvement in R&D Collaboration” (with Y. Ko)

“Categorization of R&D Collaboration Based on Problem-Solving Perspective and its Implication,” (with Y. Ko)

■ Organizational Learning / New Media


“The Expansion of User Forums: Longitudinal Social Network Analysis of the Growth of User Forums” (with M. Rhee)

“The Effect of Self-Presentation on SNS to Interpersonal Relation and Intention to Use,” (with E. Ma and S. Han)
Knowledge Management Research, 14(2), 2013
Innovation dynamics in Korea
A-U Curve

# of Innovations

Product Innovation

Dominant Design

Process Innovation

Era of Ferment

(Abernathy & Utterback, 1975)
Variation-Selection-Retention Model

Innovation as an evolutionary process

- **Variation**: Creation of a novel technical or institutional forms
- **Selection**: Occurs principally through competition among the alternative novel forms
- **Retention**: Involves the forces that perpetuate and maintain certain technical and institutional elements selected in the past

(Campbell, 1965; Van de Ven and Garud, 1994)
Variation-Selection-Retention

Northrop case

• Development of retractable landing gear following the process of variation-selection model of technical change (Vincenti, 1994).
• Interdependence matters – performance, weight, initial cost, reliability, and maintenance.
02. Imitation to Innovation

Model of Technology Development between 1960 and 1990

Technologically advanced countries

Rate of Innovation

Technological Capability

Catching-up countries

Fluid (Emergence) → Technology Transfer → Generation

Transition (Consolidation) → Technology Transfer → Improvement → Assimilation → Acquisition

Specific (Maturity) → Technology Transfer → Improvement → Assimilation → Acquisition

Product Innovation

Process Innovation

Time
05. Technology Development and R&D

**National strategic investment – selection & variation**

**Shipbuilding**
- **1970’s**
  - Government Driven
- **1980’s~90’s**
  - Private Investment
  - Increasing the private lab.
  - Engineering tech.
- **2000’s**
  - World No.1 M/S
    - 40.4%('06)

**Semiconductor**
- **1980’s**
  - Government Driven
    - 4M/16M DRAM
- **1990’s**
  - Private R&D
    - 64M/256M DRAM
- **2000’s ~**
  - World No. 1 M/s
    - MS10.2%('13)

**Cellphone**
- **In the early 1990**
  - Government Driven
    - CDMA
- **In the later 1990**
  - Expanding the market
    - Technology push
- **2000’s**
  - World No. 1 M/s
    - MS 37%('13)
05. Technology Development and R&D

**Strategic roles and cooperation between Gov. and private.**

<table>
<thead>
<tr>
<th>Period</th>
<th>Display</th>
<th>Mobile Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990’s</td>
<td>Industry-academic cooperation in R&amp;D</td>
<td>Gov.-Pri. Co-R&amp;D</td>
</tr>
<tr>
<td></td>
<td>• Supplying R&amp;D Seed Money</td>
<td>• WiBro</td>
</tr>
<tr>
<td>In the early 2000’s</td>
<td>Private Investment</td>
<td>In the early 2000’s</td>
</tr>
<tr>
<td></td>
<td>• Global Mass production</td>
<td>• Gov.-Pri. Co-R&amp;D</td>
</tr>
<tr>
<td>Present</td>
<td>World No.1 M/S</td>
<td>In the middle 2000’s</td>
</tr>
<tr>
<td></td>
<td>• 40.4%('13)</td>
<td>• World Standard and global development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increasing aver.20%</td>
</tr>
</tbody>
</table>

**Localizing the core technology**

<table>
<thead>
<tr>
<th>Period</th>
<th>Nuclear Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970’s</td>
<td>Introduction of oversea tech.</td>
</tr>
<tr>
<td>1980~1990’s</td>
<td>Intensive R&amp;D</td>
</tr>
<tr>
<td></td>
<td>• Development of Korean standard nuclear reactor</td>
</tr>
<tr>
<td>1990~</td>
<td>Foundation for economic development</td>
</tr>
</tbody>
</table>
In the case of latecomer countries, selection force is strong from the government and private firms.

Government drives selection-variation mechanism, the reverse evolutionary process that is the opposite direction of natural evolutionary process (variation-selection-retention) and firms follow this pattern. (Kim, Bae and Yang, 2014)

- Several benefits of selection force (Kim et al., 2014)
  - Time saving to develop technology at certain level.
  - Reduce competition and redundant investments in the market.
  - Reduce the failure from overlooking promising innovations.
Activities level in R&D: USA vs. Japan

- Idea generation: USA 69%, Japan 9%
- Technical feasibility: USA 82%, Japan 48%
- Applied product development: USA 46%, Japan 46%
- Prototype/pilot plant: USA 49%, Japan 46%
- Interim manufacturing: USA 13%, Japan 7%
- Full commercialization: USA 5%, Japan 7%
Technology evolution in developing countries

- The selection force at the initiation of technology development is especially prevalent in ‘latecomer countries’ such as Korea (Cho et al., 1988; Choi, 1986; Lee, 1988). China is following the same strategy.

- Important technological breakthroughs from government-initiated R&D consortia – government as a strong selection force in Japan as well
  - HDTV by NHK, Japan (1990, Office of Technology Assessment)
  - Development of VLSI in Japan (Sakakibara, 2001; Sakakibara & Cho, 2002)
Selection-Variation-Retention Model

What’s missing in the selection-variation

- **Technology** selection occurs through trial and error (variation) to find the best solution (Vincenti, 1994)
- Selection occurs in the **market** (Nelson and Winter, 1977 & 1982)

*When selection comes first...*

- From the technology perspective, learning process is often shortened
- From the market perspective, market evaluation process is omitted
Selection-Variation Mechanism in R&D Consortium

Mimicking VSR
Inverse Pyramid

Inverse VSR (Selection-Variation)
Pyramid

Early Evaluation

Continuous Evaluation

Upstream

Downstream

(Kim, Bae, & Yang, 2014)
Summary of the Main Results

- Perf (Continuous) > Perf (Early)
- Interaction

<table>
<thead>
<tr>
<th>Arrange ment</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early</td>
</tr>
<tr>
<td>Pyramid</td>
<td>3</td>
</tr>
<tr>
<td>Inverse Pyramid</td>
<td>4</td>
</tr>
</tbody>
</table>
05. Technology Development and R&D

Increasing the R&D investment and ratio of R&D to GDP

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>National R&amp;D Investment (Bil. USD)</th>
<th>Ratio to GDP(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>‘09</td>
<td>401.6</td>
<td>2.90</td>
</tr>
<tr>
<td>Japan</td>
<td>‘10</td>
<td>178.8</td>
<td>3.26</td>
</tr>
<tr>
<td>China</td>
<td>‘10</td>
<td>104.3</td>
<td>1.77</td>
</tr>
<tr>
<td>Germany</td>
<td>‘10</td>
<td>92.6</td>
<td>2.82</td>
</tr>
<tr>
<td>France</td>
<td>‘10</td>
<td>57.8</td>
<td>2.25</td>
</tr>
<tr>
<td>Korea</td>
<td>‘11</td>
<td>45.0</td>
<td>4.03</td>
</tr>
</tbody>
</table>

Source: OECD MSTI(2013)
05. Technology Development and R&D

The export structure centered advanced product through innovation

<table>
<thead>
<tr>
<th>Periods</th>
<th>Business</th>
<th>Fund (Mil. $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>'86 ~ '93</td>
<td>Ultra large scale integrated semiconductor</td>
<td>278</td>
</tr>
<tr>
<td>'93 ~ '97</td>
<td>Next generation semiconductor</td>
<td>195</td>
</tr>
<tr>
<td>'89 ~ '96</td>
<td>Commercializing CDMA</td>
<td>100</td>
</tr>
<tr>
<td>'95 ~ '01</td>
<td>Next generation TFT-LCD</td>
<td>182</td>
</tr>
</tbody>
</table>
02. Current status of South Korea

Korea, No. 1 in global market share in 143 products

- Smartphone 30.2% (Samsung Elec.)
- Flat Panel TV 27.7% (Samsung Elec.)
- D-RAM 41% (Samsung Elec.)
- Liquid Crystal Panel 24.6% (LG Display)

Source: Korea Ministry of Trade, Industry and Energy (2013)
02. Current status of South Korea

Success cases in Korea

- Desalination No.1 in the world
- Produce water that can supply 2.2 mil. population a day

Biosimilar: 
Biotherapeutic products whose active drug substance is made by a living organism or derived from a living organism.
02. Current status of South Korea

Aerospace in Korea

Korea Aerospace Industries, Ltd

South Korea Launches Rocket in Space - Naro Rocket (KSLV-I) -
00. New Era of Innovation in Korea (2010 ~)

Interaction of different aspects of innovation

Cultural Development → Creative Minds
Social Atmosphere

Innovation

Aesthetic Design
Organizational Dynamics
Technology

Entrepreneurship

R&D and Technology Development
Psy's "Gangnam Style" is the first video ever to hit a billion views on YouTube.
01. Culture Development

Global views of K-pop videos on You Tube(2011)

Source: Reorganized based on “Youtube video clicks for K-pop reach 2.3 billion from 235 countries” The JoongAng Ilbo, 2012.1.2"
01. Culture Development

Trend of K-pop Korean Wave Indices

Source: CEO Information, No. 841, February 15, 2012, published by the Samsung Economic Research Institute
01. Culture Development

Success factor behind K-pop: Cultural Diamond Model

Girls’ Generation’s song “Genie” (Sowoneul malhaebwa) was composed by Design Group from Europe with lyrics and arrangement by Yu Yeong-jin in Korea, and choreography by Rino Nakasone Razalan, a Japanese-American.

Distribution Method

Creators

- Systemized production
  - Casting & training (5y)
  - Globalized sourcing
  - Well-planned promotion
  - Cooperation with local partners

Consumers

- Active use of Social media
- Tech-savvy and active fan base
- Triple combination of vocal and dance skills and attractive looks

Contents

Source: CEO Information, No. 841, February 15, 2012, published by the Samsung Economic Research Institute
01. Culture Development

Commercial application of K-pop

1) Production Inducement Effect of K-pop for other industries

2) Industries expected to benefit from K-pop boom.

Source: CEO Information, No. 841, February 15, 2012, published by the Samsung Economic Research Institute
02. Social atmosphere

Growing emphasis on individual's lifestyle drives innovative social atmosphere.

Student’s growing interest in Start-up inside the Campus

- # of Start-up student club
- # of students who join the Student start-up club
- # of universities that have student club for start-up

<table>
<thead>
<tr>
<th>Year</th>
<th># of Start-up student club</th>
<th># of students who join the Student start-up club</th>
<th># of universities that have student club for start-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>639</td>
<td>1222</td>
<td>1833</td>
</tr>
<tr>
<td>2012</td>
<td>12248</td>
<td>18027</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>22463</td>
<td>190</td>
<td></td>
</tr>
</tbody>
</table>
Various start-ups covering broad industries and social problems.

CEO of ‘add2paper’ Haena Jeon(25)
- The company’s employees are all recent college graduates.

CEO of social venture ‘delight’
Jeong Hyun Kim(27)
- The company produces ‘hearing aid’
- Awarded for ‘Beloved Korean Company’
02. Social atmosphere

Open platform for ‘idea realization’ – creative economy town

Source: http://platum.kr/archives/14355
02. Social atmosphere

- Boom for ‘Audition program’ in various genres.
03. Product design

Hyundai’s Design strategy

“IDEA festival” – internal contest for the future design.

-Enhance and expand the R&D staff’s creativity
-Discover fresh ideas for future mobility

Source: Hyundai Motor’s New Thinking for Future Mobility
# 03. Product design

## Hyundai’s strategies to accelerate design innovation

- Promote “Quality” among managers
- Hold monthly meetings “relentless about quality”
- Use consistent design language across its product range
- Use top-down management structure – quicker decision making on design
- Learn from competitor

“Hyundai was a fast follower, now we are becoming a leader in the industry,”

Source: [http://www.smartplanet.com/blog/design-architecture/how-hyundais-design-strategy-has-paid-off/6168](http://www.smartplanet.com/blog/design-architecture/how-hyundais-design-strategy-has-paid-off/6168)
03. Product design

The iF Design Award 2013 in Munich, Germany awarded Samsung Electronics a grand total of 39 awards, including 2 iF Gold Awards

- **iF Gold Award Products** - CLP-415 and CLX-4195 Color Printer Series & twin tub washing machine

**CLP-415 and CLX-4195 Color Printer Series**

"We would like to create products that can improve our consumers’ brand experience and values, instead of just following the latest trends and designs. I hope that the ceremony gave us a chance to begin our new series of our authentic OA products."

- Seungwook Jeong, Principal Designer, Design Group, Samsung Electronics

03. Product design

**Twin tub washing machine** – designed for Southeast Asian users

03. Product design

**Collaboration with foreign designers**

KIA motors - Peter Schreyer

KIA motors – Christopher Chapman
Collaboration with foreign designers

Samsung electronics – Chris Bangle

Hyundai motors- Karim Rashid
04. Organization culture

**Case 1**

The horizontal structure is wide-spread in organization

**Flexible Organization**

Organization structure can be very flexible due to the project-oriented approach

**Free Communication**

Discuss and exchange ideas via Kakao Azit which is closed community between employees
04. Organization culture

Increasing the horizontal structure in organization

Case 2

Remove the position(rank)

Open Idea Contest

Using idea contest, some business units are established
Realms of Individual & Collective Action in Organizations

<table>
<thead>
<tr>
<th>Novelty (Divergence from prior experience)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temporal Separation of Conception and Execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>

- **Improvisation** (Jazz improv.)
- **Composition** (Classic concert)
- **Algorithmic Execution** (Operators in nuclear power plant)
- **Algorithmic Planning** (SOP Generation for NPP)

Source: Fisher & Amabile
A Model of Improvisational Creativity

Preparation

External Problem Presentation

Conception
- Provocative competence (Interrupting habit patterns)

Execution

Improvisation (Simultaneous/Synchronous Processes)

Improvised creative outcome
- Can feed into the idea generation stage of compositional creativity
- Retrospective Sensemaking

Expertise
- Well learned facts & routines

Creativity-relevant Processes
- Distributed Task
- Soloing & supporting
- Continual negotiation
- Risk orientation
- Hanging out: CoP

Intrinsic Motivation
Focus on problem/opportunity

Work Environment
- Embracing errors
- Experimental culture
- Real-time info flow
- Minimal structures

Source: Fisher & Amabile + Barrett
Seven Characteristics of Improvisation Related to the Creative Organization

• Provocative competence – Interrupting habit patterns
  – The difficulty of trying new things ➔ Consequences!!!
  – Remember “Kodak”?

• Embracing errors as source of learning
  – Errors often lead to a great invention, but it has to be embraced and nurtured by other members in the organization
Seven Characteristics of Improvisation Related to the Creative Organization

• Minimal structures that allow maximum flexibility
  – Music: patterns of melodies, chord changes, sections and phrases
  – Organization: stories, myths, visions, slogans, mission statements, trademarks
Seven Characteristics

• Distributed task – Continual negotiation toward dynamic synchronization

• Innovation is an ongoing social accomplishment

You don’t know what the other player is going to play, but on listening to the playback, you hear that you related your part very quickly to what the other player played just before you. It’s like a message that you relay back and forth... You want to achieve that kind of communication when you play. When you do, your playing seems to be making sense. It’s like conversation

- Tommy Flanagan (Jazz Pianist), 1994
Seven Characteristics of Improvisation Related to the Creative Organization

• Reliance on retrospective sense-making
  – The improviser may be unable to look ahead at what is going to play, but he can look behind at what he has just played; thus each new musical phrase can be shaped with relation to what has gone before. He creates his form retrospectively.
  – Those junk boxes at IDEO
Seven Characteristics of Improvisation Related to the Creative Organization

• Hanging out – Membership in communities of practice (Informal educational system with rich context)
  – Organizations must see beyond conventional job descriptions and recognize the rich aspects of practices

• Alternating between soloing and supporting
  – Rotating leadership
The Processual ‘Flow’ of Different Models

Sequential model

Compression model

Flexible model

Improvisational model
Hyundai Card, a latecomer founded in 2001, became a major player in a credit card industry by attaining 12.5% market share in 2011.

Figure 1. Market share and the number of customers of Hyundai Card

Figure source: http://www.slideshare.net/nceonceo/session-output
Service Sector
Innovation in Korea
Case of Hyundai Card

- **Management philosophy**
  - **Strategy & Execution**: There can be no execution without strategy and no strategy without execution.
  - **Speed**: Speed is the only variable separating winners and losers in the final match.
  - **Never-ending change**: Existence requires continuous change.
  - **Diverse yet United**: Top-level organizations are built upon diverse elements working together in tandem.

- Achieve common goals through communication and collaboration.

*Integrated strategy of Hyundai Card*  
*“Premium”*

Source: Hyundai Card official home page
Case of Hyundai Card


- Premium targeting

✓ The Black: The first VVIP card in South Korea (top 0.05%).
✓ Card-color marketing: Segmentation within premium products (Black-Purple-Red)

Source: Hyundai Card official home page
Case of Hyundai Card

- **Strategy for exclusiveness**

  - Establish high-end franchisee network based on customers’ premium life style.
    - Hotel, Wine, Spa, Beauty, Gourmet

  - Separate organization for premium marketing
    - Premium marketing team: Black, Purple, Red
    - Platinum marketing team: Platinum 2,3 series

Source: Hyundai Card official home page
Case of Hyundai Card

- Strategy for exclusiveness

  ✔ Brand competitiveness

  • First to introduce brand marketing in credit card industry.
  • Put an effort to establish brand identity (BI) in addition to product branding.
  • Conceal the image of a parent company and emphasize the image of card expert.

  ✔ Culture Marketing – Super series

Contents

- Asan Medical Center
- Innovation Design Center
- What We Learned
- Service design for lowering preoperative anxiety
All Started w/ One Man’s Dream

- Asan Medical Center

“To Help the Underprivileged of the Society…”

ASAN, Chung Ju-Yung (1915-2001)

Press Conference on the Establishment of Asan Foundation (July 1, 1977)
Jun. 1989: Opening of AMC (1,000 beds)
Jun. 1990: Opening of Asan Research Center for Life Sciences
Oct. 1994: Opening of the East Building (2,200 beds)
Apr. 2002: Proclamation of the New Hospital Name and CI
Dec. 2004: Opening of Asan Education Research Building
May 2008: Opening of the New Building (2,700 beds)
Sep. 2011: Opening of the New Research Building
Beds
(As of Jan, 2014)

2,700 beds
(including 203 ICU beds)

Patient Volume
(Daily AVG, Jan-Dec, 2013)

11,027
(Outpatients)

2,494
(Admissions)

231
(Surgeries)

Employees
(As of Jan, 2014, Total 7,567)

1,650
(MDs)

3,369
(RNs)

2,548
(Others)
Multidisciplinary Organization

<table>
<thead>
<tr>
<th>Specialized Hospital</th>
<th>Specialized Center</th>
<th>Clinical Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>42</td>
<td>49</td>
</tr>
<tr>
<td>- Asan Medical Center Children's Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Asan Medical Center Heart Institute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Asan Cancer Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Digestive Disease Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Asan Diabetes Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Health Screening and Promotion Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Organ Transplantation Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Stroke Center ...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pulmonology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cardiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Neurology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Thoracic &amp; Cardiovascular Surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Emergency Medicine ...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Heart Institute

Organ Transplantation Center

Surgery  Cardiology  Hematology/Oncology
Pulmonology  Ophthalmology  Urology  Laboratory Medicine

Center of Excellence

Cancer Center

Breast Endocrine Surgery  Endocrinology
Gynecology  Hematology  Gastroenterology

Core Strategy

Multidisciplinary System
Liver Transplantation Asan Medical Center (Aug. 1992 ~ Dec. 2013)

1,000 LTS (Aug. 1992 ~ Nov. 2004)
2,000 LTS (Dec. 2004 ~ Jun. 2008)
3,000 LTS (Jul. 2008 ~ Apr. 2011)
4,000 LTS (Jul. 2008 ~ Apr. 2011)

<table>
<thead>
<tr>
<th>Year</th>
<th>'92</th>
<th>'93</th>
<th>'94</th>
<th>'95</th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'00</th>
<th>'01</th>
<th>'02</th>
<th>'03</th>
<th>'04</th>
<th>'05</th>
<th>'06</th>
<th>'07</th>
<th>'08</th>
<th>'09</th>
<th>'10</th>
<th>'11</th>
<th>'12</th>
<th>'13</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDLT</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>11</td>
<td>25</td>
<td>33</td>
<td>82</td>
<td>105</td>
<td>123</td>
<td>137</td>
<td>152</td>
<td>210</td>
<td>214</td>
<td>234</td>
<td>286</td>
<td>262</td>
<td>292</td>
<td>317</td>
<td>317</td>
<td>318</td>
<td>308</td>
<td>3,431</td>
</tr>
<tr>
<td>DDLT</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>16</td>
<td>30</td>
<td>15</td>
<td>11</td>
<td>4</td>
<td>20</td>
<td>20</td>
<td>21</td>
<td>23</td>
<td>34</td>
<td>64</td>
<td>53</td>
<td>50</td>
<td>86</td>
<td>61</td>
<td>81</td>
<td>626</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>9</td>
<td>19</td>
<td>35</td>
<td>49</td>
<td>112</td>
<td>120</td>
<td>134</td>
<td>141</td>
<td>172</td>
<td>230</td>
<td>235</td>
<td>257</td>
<td>320</td>
<td>326</td>
<td>345</td>
<td>367</td>
<td>403</td>
<td>379</td>
<td>357</td>
<td>4,055</td>
</tr>
</tbody>
</table>

Asan Medical Center (Aug. 1992 ~ Dec. 2013)
Contents

• Asan Medical Center

• **Innovation Design Center**

• What We Learned

• Service design for lowering preoperative anxiety
Our History and Plan

2013

『Establish organization and its identity』
- Define R&R and work process
- Benchmark Hyundai Card, Samsung Electronics, Mayo Clinic (Center for innovation), IDEO, etc.
- Build company-wide consensus on innovation
- Perform pilot project

2014

『Plan mid-long term innovation strategy』
- Develop list of quick win projects as well as mid-long term projects
- Spread innovative culture driven by each department
- Perform innovation projects

2015

『Create innovative culture』
- Restore AMC’s original intention of innovative spirit
Multi-disciplinary team organization

- President & CEO
- Office for Planning and Coordination

Innovation Design Center

- Medical Director
  - Industrial Design
  - Behavioral Ecology
  - Industrial Engineering
  - Process

- Business Director
  - General Admin
  - Organization
  - Marketing
  - Strategy
  - Business Analysis
  - Nursing
  - Patient Experience

“In-house Innovation Consultancy”
Mission

1. To create unexpected and remarkable customer experience

Goal

2. Help AMC employees overflow with creative ideas freely and execute/experiment with joy (Build ‘Creative Confidence’ within AMC)
Definition and Methodology

Definition of Innovation

Innovation is...
- Identify key causes and hidden needs
- Deliver new solutions
- Create remarkable experience

Methodology: “Strategic Thinking” + “Design Thinking”

1. Solve the root cause of the problem by changing perspective
2. Quick low fidelity test and iterative improvement
## What we do

### Platform 1

**Customer Experience**

<table>
<thead>
<tr>
<th>External Customers</th>
<th>Internal Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Value</td>
<td>Pride</td>
</tr>
<tr>
<td>High Service System</td>
<td>Support</td>
</tr>
<tr>
<td>High Touch</td>
<td>Collaboration</td>
</tr>
<tr>
<td></td>
<td>Sustainability</td>
</tr>
</tbody>
</table>

### Platform 2

**Innovation Capability**

- Innovation Symposium
- Grand Round (Speaker series, benchmark study)
- Asan Innovator Group
- Innovation Blog
- Open Platform (Collaboration, Idea sharing)
- Innovation Workshop
- Hospital Innovation Network in Korea
Major Activities

Benchmarking: IDEO/FROG

Transform 2013 & CFI

Patient Experience: Innovation+Empathy Summit
### Recent Trend: Patient-Centered Innovation

#### In US

- **Office of Patient Experience (2009)**
- **GARFIELD INNOVATION CENTER**
- **Center for Innovation**
- **Kaiser Permanente Innovation Consultancy**

#### In Korea

- **Patient Empathy Center (2010)**
- **Creativity Center (2013)**
- **Patient Centered Service Design Center (2014)**
- **Innovation Design Center (2013)**

- Recruited experts from consulting industry
- Strategy, In-house Consulting, and new business
- Benchmarked IDEO, KP, and Mayo Clinic
- Multi-disciplinary team organization
- Recruited executive from five star hotel
- Patient centered service design
Contents

• Asan Medical Center

• Innovation Design Center

• What We Learned

• Service design for lowering preoperative anxiety
• What we learned – Transform 2013

Key trends are humanizing medicine and consumerization

Market Trends

1. Technology Migration
2. Expectation Migration
3. Humanizing Medicine
4. Lifestyling Health

Major Players’ Strategy

Healthcare → Health
Patient → People
Hospital → Home
What we learned - CFI

Center for Innovation (Mayo Clinic)

Key Features

Structure
- Medical Director, Admin Director
- Project managers & designers
- Innovation coordinators
- IT specialists and Admins

Project
- Over 30 projects per year
- Project team is composed of 1 manager, 1 innovation coordinator, 1-3 designers

Platform
1. Practice redesign (50%)
2. Health and Wellbeing (15%)
3. Connected Care (15%)
4. Innovation Accelerator (20%)

Key Success Factors
1. Clear understanding of mission and vision
2. Methodology – Design Thinking
3. Aggressive involvement of stakeholders
4. Effective utilization of external advisor
What we learned – Office of Patient Experience

Office of Patient Experience (Cleveland Clinic)

“Patients were coming to us for the clinical excellence, but they did not like us much” (Toby Cosgrove, CEO, 2009)

Mission

- Ensure consistently patient-centered care by partnering with caregivers to exceed the expectations of patients and families

Operation

- $9.2M annual budget and 112 people
- Led by Chief Experience Officer

Major Activities

Changes in culture
- Hospital-wide notice of main issues
- Workshop (43,000 employees, invest $11M)
- Innovation and Empathy Summit
- Empathy Video (2M view)

Changes based on patients’ needs
- Find root cause - “Business Intelligence Unit”
- Adopt “Best Practice”
- Same day appointment
- Protocol for effective communication (ex. Purposeful nurse rounding)
- Expectation management – patient education

Percentile Ranking

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>55</td>
<td>92</td>
</tr>
<tr>
<td>Cleanness</td>
<td>4</td>
<td>71</td>
</tr>
<tr>
<td>Doctor Communication</td>
<td>14</td>
<td>63</td>
</tr>
<tr>
<td>Nurse Communication</td>
<td>16</td>
<td>72</td>
</tr>
<tr>
<td>Comm. Medication</td>
<td>17</td>
<td>66</td>
</tr>
<tr>
<td>Pain Management</td>
<td>10</td>
<td>61</td>
</tr>
<tr>
<td>Quiet at Night</td>
<td>5</td>
<td>31</td>
</tr>
</tbody>
</table>
Service design for lowering pre-operative Anxiety

“Surgery is a coin with two sides: one side that gives hope, the other side gives anxiety. We saw the anxiety side.”

This project focuses on one of the most physically, psychologically, and financially difficult experience patients go through: preoperative anxiety. It applied human-centered experience design to an entire preoperative process.
Reducing Wait Time in Preoperative waiting area
- Sharing of next scheduled surgery time
- Please have the patient here by 00:00

Preoperative Waiting Area Improvement
- Nature friendly environment
- Privacy consideration
- Optimization of flow and noise reduction

Campaign for Preoperative Meeting
- Significance and Voluntary
  - Emphasis on significance of preoperative meeting by physician
  - Stimulation of perception change leading to voluntary participation

Expansion of wheelchair transportation
- Reduction of anxiety involving stretcher cart transportation

Providing Surgery Information
- Information on general surgery & procedure (mobile website & mobile app)
- Change to surgery consent process
01. Lowering pre-operative Anxiety

Campaign for preoperative meeting

'Meeting is a Promise'

'Meeting — Well begun is half done'
02. Lowering pre-operative Anxiety
Providing surgery information

Development and Deployment of Surgery information through Mobile Website

Surgery procedure information main screen
3D graphics and video
Surgeon information
03. Lowering pre-operative Anxiety

Surgery process improvement

Reducing wait time in preoperative waiting area

The key problem was that the actual surgery time was not shared by all the stakeholders involved.

Average wait time 21min. to 15min. Patients waiting more than 30min 22.4% to 9%

Each caregiver shares single standard time
03. Lowering pre-operative Anxiety

Surgery process improvement

Expansion of wheelchair transportation
04. Lowering pre-operative Anxiety

Preoperative waiting area improvement

An environment design that designated individual spaces for wheelchairs and stretcher carts considering the orientation of their waiting positions, and to provide private, nature-friendly environment. Automated entrances are moved so that traffic flow is streamlined.
04. Lowering pre-operative Anxiety

Preoperative waiting area improvement

**Function**

- Noise Control
- **Separate** spaces for wheelchairs and stretcher carts
- Semi-private & nature inspired environment
- Centralized nurse station
- Augmented preoperative area

**Concept**

- Metaphor of nature
- Compartment
- Indirect lighting
- Circulation
Thank you very much for your attention. Please contact me for further information.

Sung Joo Bae

Associate Professor of Operations and Technology Management

Operations, Decisions, and Information (ODI), Yonsei University School of Business
Tel. +82-2-2123-6578    Fax. +82-2-6442-2515
Email: sjbae@yonsei.ac.kr
Address: 262 Seongsanno, Seodaemun-gu, Seoul 120-749, KOREA