Business Process Reengineering Project 2: Innovative Technology Development

HARUO OGAWA
Director
Senior Executive Managing Officer
Chief Technology Officer
Chief R&D Officer
Olympus Corporation
September 13, 2017
Disclaimer

- This material contains forward-looking statements that reflect management’s current views, plans, and expectations based on information available at the time of preparation. These forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, future business decisions, and other internal and external factors that may cause the Company’s actual results, performance, achievements, or financial position to be materially different from any future results expressed or implied by these forward-looking statements.

- Additionally, this information is subject to change without notice. Accordingly, other information should be used in addition to this material when making investment decisions.

- These materials contain information on products that have not yet been approved under The Law on Securing Quality, Efficacy and Safety of Products Including Pharmaceuticals and Medical Devices (including products still under development). This information is not provided for the purposes of advertising or offering medical advice. This information is purely meant to offer examples of Olympus’ R&D activities. Moreover, the Company does not guarantee that products described in these materials will actually be marketed.

- Olympus Corporation assumes no responsibility for any damage resulting from the use of this material.
Agenda

- Challenges to current situation, risk and environment change
- R&D Activity Examples
- Innovation Risk Management
1. Priority Issues and Response Measures for R&D Group

- Improve R&D efficiency
  (Ratio of R&D expenditures to revenue 11%* (FY2017))
  * Product development expenditures

- Address risks arising from technological innovation (AI, robotics, ICT)

- Business Process Reengineering (BPR) Project
  Prioritization of R&D themes and standardization of R&D processes

- Innovation Promotion System
  Identify risks with potential to impede future growth and advance initiatives for transforming risks into opportunities
2. Ratios of SG&A Expenses and R&D Expenditures to Revenue

- Balanced ratios of gross profit and SG&A expenses to revenue over long-term range while achieving operating margin of more than 10%
- Increased ratio of R&D expenditures to revenue in conjunction with enhancement of differentiated technologies

Ratios of gross profit to revenue (%)
Ratio of SG&A expenses to revenue (%)
Operating margin of more than 10%
R&D expenditures (¥ Billion, Left)
Ratio of R&D expenditures to revenue (%)
Enhancement of differentiated technologies

Operating margin of more than 10%
Enhancement of differentiated technologies
3. Awareness Reforms in Relation to R&D

- **Recognize low efficiency of Olympus’ R&D activities**
  → Restrict R&D expenditures in existing businesses to level similar to that of competitors
  → Secure “innovation budget” to prepare for technological innovation

- **Leverage strengths of matrix organizational structure**
  → Generate synergies by utilizing unique development capabilities of each business
  → Reflect successes of upstream R&D activities into product development

![Graph showing trends in revenue and R&D expenditures over time]
4. Four Steps of R&D Expenditure Reform

**Business Process Reengineering (BPR)**

1. **Determine R&D budgets in top-down manner**

2. **Stringently manage conditions for selecting R&D themes based on stage-gate process**

3. **Optimize R&D expenditures for each theme**

4. **Evaluate priority of each theme**

**Total**

**ROI**
5. Secure of Innovation Budget

- Define R&D budgets in a top-down manner
- Prioritize R&D expenditures in specific businesses based on the ROI of each theme
- Concentrate fundamental R&D activities on the development of technologies shared between businesses (maintain differentiated status by strengthening core technologies)
- Secure innovation budget to address technological innovation risks
6. Four Operating Environment Changes and 10 Risks Brought About by Technological Innovation

- Loss of expertise
- Rise of substitute / destruction technologies
- Commoditization of devices
- Decreased relative value of devices
- Increased competition for human resources
- Increase of patient influence
- Introduction of a pay-per-use model
- Change in sales channels
- Health care innovation in emerging countries
- Lowering of barrier to entry into market
7. Development of Scenarios to Change Risks into Opportunities through Early Identification of Risks

<table>
<thead>
<tr>
<th>I. Access technologies</th>
<th>II. Imaging and sensing technologies</th>
<th>III. Recognition and analysis technologies</th>
<th>IV. Treatment and therapeutic technologies</th>
<th>V. Report and evidence technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF and IS technologies</td>
<td>4K and 3D technologies</td>
<td>AI technologies</td>
<td>Robotics technologies</td>
<td>ICT technologies</td>
</tr>
</tbody>
</table>

- Establish barriers to entry by strengthening core technologies
- Mitigate innovation risks through reinforcement of alliances
- Create opportunities
- Generate new customer value
8. R&D Activity Examples

Ⅲ. Recognition and analysis technologies: Colon Diagnosis Support
(CAD: Computer Aided Diagnosis)
8. R&D Activity Examples

Ⅲ. Recognition and analysis technologies: Utilization of AI for Examination and Diagnosis Technologies

Colon Diagnosis Support (CAD: Computer Aided Diagnosis)

- Automatically detect potential polyps in real-time
- Decrease patient discomfort (QOL)
- Support discovery by physicians
- Aid in diagnosis by doctors
8. R&D Activity Examples

III. Recognition and analysis technologies:
Utilization of AI for Examination and Diagnosis Technologies

Utilization of AI (Deep Learning)

Take advantage of superiority of customer contact points achieved through leading endoscope market share to collect data on endoscopy image data from around the world.
8. R&D Activity Examples

IV. Treatment and therapeutic technologies: Multi-Jointed, Flexible Robotic Assisted Surgery System
8. R&D Activity Examples  
IV. Treatment and therapeutic technologies: Application of Robotics Technologies to Treatment and Therapeutic Technologies

| Development and verification testing of multi-jointed, flexible robotic assisted surgery system | Fukushima Subsidy for Development of Medical and Welfare Devices |
| (Funding Program for Development and Testing of World-leading Medical Devices) | (Development of high-power endotherapy devices and training equipment) |

**Therapeutic Support System for Gastrointestinal Endoscopies**

*Electrically Driven Laparoscope with Multiple Degrees of Freedom*

*High-Power Endotherapy Device*

Expands functionality of therapeutic support system for gastrointestinal endoscopies

*Training Equipment*

Promotes spread of therapeutic support system for gastrointestinal endoscopies
Characteristics:
• Effective control of two, multi-jointed endotherapy devices
• Left hand for lifting, right hand for cutting
• Capable of delicate motions, such as peeling of thin surface layers
8. R&D Activity Examples

V. Report and evidence technologies:
+ICT Strategy
8. R&D Activity Examples
V. Report and evidence technologies: +ICT Strategy

Strategic Directives

Target higher earnings by increasing customer value and service level through “+ICT strategy” focused on products embodying Olympus’ strengths (equipment terminals)

1. Increased Customer Value
Improve efficiency of customer procedures and create new services by mixing products and ICT in relation to diagnosis support, work support, training, and other existing procedures and frameworks

2. Olympus Management Reforms and Operational Efficiency
Utilize ICT and IoT to reform and improve efficiency of Olympus’ manufacturing system, sales support, and other procedures and frameworks

+ICT Strategy

Medical Business Products
Scientific Solutions Business Products

ICT Services
8. R&D Activity Examples

V. Report and evidence technologies: +ICT Strategy

Provide services from cloud servers through +ICT strategy (images, diagnosis data, equipment logs)

Hospitals

Endoscopic diagnosis

Endoscope cleaning

Division IT system (Solemio QUEV)

Existing Olympus IT products: Procedure support services in endoscopic treatment facilities

Contributions to Quality Medical Treatments
a. Diagnosis support (utilizing AI)
b. Report preparation support
c. Reprocessing and other work support
d. Training support

Contributions to Medical Economic Benefits
a. Equipment maintenance and symptom management (utilizing IoT)
b. Appropriate use of consumables
c. Cost optimization through pay-per-procedure model
9. Innovation Risk Management

Alliances through Innovation Promotion System
Introduce new human resource system for the specialists (fellowship system for R&D group)

Establish innovation promotion organization on October 1, 2017, under direct jurisdiction of CTO* and comprised of several fellows and chief fellows, including Kazuhiro Gono, who was awarded the Medal with Purple Ribbon as part of the Cabinet Office’s Biannual Conferment of Decorations in spring 2017 for the development of an endoscopy system that utilizes Olympus’ NBI technologies

(*) CTO: Chief Technology Officer (Head of R&D Group)