Business Models and Platform economy

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Naoaki Fujino (Nomura Research Institute)
Prof. Dr. Ulrich Löwen (Plattform Industrie 4.0 AG6 / Siemens AG)
Introduction

In the computer industry, in 1966, IBM developed the System 360, and for the first time a clear interface was defined between software and hardware, and it was successfully modularized, so that another organization can use its unique capabilities to create different products.

The apparel industry and the logistics industry have formed a global corporate network for many years. In recent years, advances in IT technology have led to the early establishment of international standard interfaces between open companies such as 3D/PLM, EDI, and XML by GS1 (global standard one) and as a result, platformers that operate an ecosystem of tens of thousands of companies have appeared. In the B2C field, GAFA expanded its service business to about 200 countries at the same time as the global expansion of smartphones, create new business models and industrial structure based on software with zero marginal cost and IT with exponentially improved performance.

In the manufacturing industry, there is a product production ecosystem formed by vertically integrated companies. However, an open platform that can scale out to promote product value as a service is still in the stage of budding cases.

It is considered to be of great significance for both countries that Japan and Germany share such a background, exchange opinions on digitization in the manufacturing industry, and have a common understanding of the overall view of future growth of the manufacturing industry.
JPN-GER Discussion on Digital Business Models

Purpose

Context
• There are many theses and ideas from a technical perspective (e.g. security, communication, artificial intelligence, etc.)
• There are many claims from an economic perspective (e.g. platform economy, new intermediaries, etc.)
• Often facts in B2C are directly transferred to B2B, but the discussions typically stay on an abstract level and generally do not reach the business level in the manufacturing industry

Overall objective
• Illustration of the economic importance of digitization for the manufacturing industry, driven by the analysis of selected examples, scenarios and use cases that can be observed in the market

Addressed stakeholder
• Primarily the manufacturing industry, in order to provide guidance in the complex discussions, but also politics and research

Consequences
• JPN and GER both benefit from a joint discussion because they have a similar understanding of the importance of digitization for the future of the manufacturing industry
Overall Evolutionary Approach

Evolutionary procedure

**Selection of examples**

- clear understanding of customer needs and market trends

**Structure of template**
- Overall description → purpose
- Value network → orchestration, platform, ecosystem
- Revenue stream → monetarization
- Business model contract → value
- Business model innovation → disruption

**Conclusions (still in discussion)**
- Different *purposes* of business models, ecosystems and digital platforms
- Different *architectures* of business models, ecosystems and digital platforms
- *Communication* of lessons learnt and best practices
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

- **truck & constr. mach. mgmnt. services provider**
- **ERP services provider**
- **Landlog (platform operator)**
- **owner**
- **construction company**
- **truck & constr. mach. mgmnt. services**
- **ERP services**
- **progress report services**
- **truck services**
- **3D view services**
- **3D view data**
- **usage information**
- **construction machinery services**
- **truck services supplier**
- **constr. mach. operator**
- **construction machinery services supplier**

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Physical value stream

Services value stream
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

owner

construction
report

construction company

truck services

construction machinery services

truck services supplier

construction machinery services supplier

physical value stream

services value stream
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

Physical value stream

Services value stream
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

- **truck & constr. mgmnt. services provider**
- **Landlog (platform operator)**
- **owner**
- **construction company**
- **truck services supplier**
- **truck services operator**
- **construction machinery services supplier**

**Physical value stream**

**Services value stream**
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

- **truck & constr. mach. mgmt. services provider**
- **ERP services provider**
- **Landlog (platform operator)**
- **owner**
- **construction company**
- **truck services supplier**
- **truck operator**
- **constr. mach. operator**
- **construction machinery services supplier**

Physical value stream

Services value stream
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

- **owner**
- **truck services supplier**
- **construction machinery services supplier**
- **usage information**
- **3D view services provider**
- **truck & constr. mach. mgmt. services**
- **ERP services**
- **Landlog (platform operator)**
- **ERP operator**
- **physical value stream**
- **services value stream**

Value Streams:

- **Progress report services**
- **Construction company**
- **Construction machinery services**
- **Construction company**

Suppliers:

- **ERP services provider**
- **3D view services provider**
- **Drone operator**
- **Truck services supplier**
- **Construction machinery services supplier**

Operators:

- **Owner**
- **Construction company**
- **Truck service supplier**
- **Construction machinery service supplier**

Platforms:

- **Landlog (platform operator)**

Services:

- **ERP services**
- **Progress report services**

Machinery:

- **Construction machinery**
- **Truck services**

Physical Value Stream:

- **Truck & Constr. Mach. Mgmt. Services**
- **ERP Services**
- **3D View Services**

Services Value Stream:

- **Truck & Constr. Mach. Mgmt. Services**
- **ERP Services**
- **3D View Services**
- **Usage Information**
- **Physical Value Stream**

The diagram illustrates the flow of value streams and the interactions between different stakeholders in a construction project.
Landlog: Platform for monitoring and managing daily construction activities

Value Streams

- **truck & constr. mach. mgmt. services provider**
  - truck & constr. mach. mgmt. services

- **ERP services provider**
  - ERP services

- **Landlog (platform operator)**
  - 3D view services
  - drone operator
  - 3D view data
  - usage information
  - truck & constr. mach. mgmt. services

- **owner**
  - construction report
  - construction company

- **truck services**
  - truck services supplier
  - truck operator

- **construction machinery services**
  - construction machinery services supplier

- **physical value stream**
  - services value stream
Railigent: Application suite for intelligent asset management
Classical value network (example rolling stock)

Value Streams

- Component supplier delivers component to asset provider
- Asset provider delivers asset to asset operator
- Asset operator provides asset services to user
- User provides maintenance services to asset maintainer

physical value stream  data/services value stream
Railigent: Application suite for intelligent asset management
Extension of value network by an IIoT platform operator

Value Streams

- Component supplier
  - delivers component

- Asset provider
  - delivers asset

- Asset operator
  - provides asset services
  - provides maintenance services

- Asset maintainer
  - provides usage information of asset

- Railigent® Application Suite
  - data-driven services

- Internal IT platform
  - provides platform services

- Provider IT infrastructure
  - provides IT infrastructure

- Physical value stream
- Data/services value stream
**Value Streams**

- **component supplier**
- **asset provider**
- **asset operator**
- **asset services user**

The diagram illustrates the flow of assets, services, and information between these entities.

**Business Model**

**Major business model changes:**

- **Who**: same customers
- **What**: additional outcome-based services
- **Value**: additional revenue stream
- **How**: IIoT-platform extends value network

**Consequences:**

- Right to use usage information of assets based on individual contracts with asset operators

**Railigent**: Application suite for intelligent asset management

Deliver outcome-based asset services

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**Siemens Mobility**
Railigent: Application suite for intelligent asset management
Extension to ecosystem

Business Model

Major business model changes:

- **Who & how**: other asset provider – typically competitors – and component supplier as new customers
- **What & value**: acting as value integrator with different value propositions & revenue mechanisms
  - Managed services
  - Software as a service
  - Insights as a service
  - Outcome as a service

Value Streams

<table>
<thead>
<tr>
<th>Component Supplier</th>
<th>Asset Provider</th>
<th>Asset Operator</th>
<th>Asset Services User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivers component</td>
<td>Delivers asset</td>
<td>Provides asset services</td>
<td>Provides maintenance services</td>
</tr>
<tr>
<td>Provides data &amp; applications; feeds back insights</td>
<td>Provides applications, insights &amp; services</td>
<td>Provides usage information of asset</td>
<td>Provides IT infrastructure</td>
</tr>
<tr>
<td>Provides data &amp; applications; feeds back insights</td>
<td>Provides data &amp; applications &amp; insights; feeds back insights</td>
<td>Provides platform services</td>
<td>Provides platform services</td>
</tr>
</tbody>
</table>

Value Streams Flow:

- **Physical value stream**
- **Data/services value stream**

Value Propositions:

- **Value**: Siemens Mobility
- **Who**: Railigent
- **How**: Value chain, revenue mechanism, value proposition

- **Value**: yes significant change
- **Who**: no significant change
- **How**: significant change
### Analysis

First conclusions from elaborated examples

<table>
<thead>
<tr>
<th>Description</th>
<th>Purpose of platform</th>
<th>Platform pattern</th>
<th>Business model of platform operator</th>
<th>Revenue stream of platform operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>CADDI</td>
<td>Manufacturing platform for metal sheet bending</td>
<td>Matching demand and supply</td>
<td>Provision of metal sheet bending services</td>
<td>For delivered bended metal sheet</td>
</tr>
<tr>
<td>SITATERU</td>
<td>Organizer of supply chain for apparel companies</td>
<td>Matching demand and supply</td>
<td>Provision of manufacturing services for apparel products</td>
<td>For manufactured apparel product</td>
</tr>
<tr>
<td>Landlog</td>
<td>Platform for monitoring and managing daily construction activities</td>
<td>Improvement of value-chains of a customer</td>
<td>Cloud-based IIoT-platform</td>
<td>Data-driven services</td>
</tr>
<tr>
<td>V-INDUSTRY</td>
<td>Digital procurement of components</td>
<td>Matching demand and supply</td>
<td>Operation of platform Data-driven services</td>
<td>For successful transaction For data-driven services (time based)</td>
</tr>
<tr>
<td>Railigent</td>
<td>Application suite for intelligent asset management</td>
<td>Improvement of value-chains of a customer</td>
<td>Cloud-based IIoT-platform</td>
<td>Performance improvement Operation of platform</td>
</tr>
<tr>
<td>GrabCAD</td>
<td>3D printing &amp; CAD collaboration software</td>
<td>Provision of technical infrastructure to lock a community to a product</td>
<td>Support of current business model (improve market penetration of current products)</td>
<td>No revenues from platform operation</td>
</tr>
</tbody>
</table>
Analysis: Identification of Generic Platform Patterns

Example Cloud-based IIoT Platform

Value Streams

- Service Provider
  - provides services
  - provides app including execution services

- Machine User
  - provides usage information
  - provides connected machine

- App Developer
  - provides services to develop apps

- IIoT Platform Operator
  - provides computing infrastructure services
  - provides services to connect machines

- System Integrator
  - provides services for platform services incl. app usage

- Service Provider
  - for services

- Machine User
  - for platform services
  - for integration services

- App Developer
  - for app usage

- IIoT Platform Operator
  - for computing infrastructure services

- System Integrator
  - for platform services

- Computing Infrastructure Provider
  - physical value stream

- revenue stream

Revenue Streams

- Service Provider
  - for services

- Machine User
  - for platform services
  - for integration services

- App Developer
  - for app usage

- IIoT Platform Operator
  - for computing infrastructure services

- System Integrator
  - for platform services

- Computing Infrastructure Provider
  - physical value stream

- service value stream
Summary and Outlook

**Publication of analysis results and lessons learnt**

Planned structure of report:
- Introduction
- JPN and GER examples
  - Overall description (purpose)
  - Value network and revenue streams
  - Business model contract
  - Business model innovation
  - Miscellaneous
- Analysis of the examples
- Outlook

Publication date: April 2021 (planned)

**Further elaboration on digital business models**

Analysis of the dynamics of platform business model mechanisms and network effects

Investigation of platform pattern

Exchange with Germany-Japan Standardization Experts, especially in the context of edge platforms

Elaboration of further examples if necessary

Dissemination of lessons learnt
Discussions on business models and platform economy still need to be deepened, but we would like to evolve by combining the views of both sides as a reference and stimulus in our cooperation between Japan and Germany.

Thank you!

ご清聴ありがとうございます。