Designing Digital Platforms

An approach to structure, operate, and govern digital platform-based business models

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A Typical Story of IIoT
The added value lies not so much in the smart product itself but in its connections.

Potential Added Value | Increase in Management Complexity

Source: Based on: Porter et al: How Smart, Connected Products Are Transforming Competition, HBR 2014
365FarmNet as a platform for agriculture: Facilitated by Claas as an open platform for complementors, but also competitors!
THE crucial question: App or Plattform?
THE STRATEGIC DECISION:

How to survive competition in a “platformed” industry: App or Platform?

For Platforms: How to manage (and build & nurture) the ecosystem?

For Apps: How to become a preferred partner in an ecosystem (in which one)?

How to set the right degree of openness?
# Creating Platform-based Business Models

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## Governance Tools
- Platform Sponsor
- Platform Manager

## Value Appropriation
- How to charge?
- Whom to charge?

## Value Interaction
- Value Proposition
- Value Consumption
Platforms (business ecosystems) beat products every single time.
A case for systematic business model innovation
Creating new business models demands to work with assumptions

Source: M.W. Johnson: Seizing the White Space, 2010
(1) Iterative „Design Thinking“ approach:
- Agile process with continuous iterations and strong user focus
- Open, collaborative task in responsibility of every product manager
- Early use of alternative BM prototypes
- BM Canvas as a communication tool: Ability to map BM alternatives
- Intuitive approach, at the same time systematically
- Today, often company-specific canvas

(2) BM patterns for systematic search for new BM:
- Successful BM are based on recurring patterns
- Derivation of general and company specific libraries of BM patterns
- Systematic problem solving based on TRIZ approach

(3) Rapid experimentation and validation in field
- BMI means to develop alternatives – and to test assumptions
- Ability to generate quick and cheap experiments (e.g., 5x5x5x5x5 logic by Schrage)
- Experimentation template

* more information: bmi.rwth-aachen.de
A Toolbox
Depiction of Business Model & Ecosystem in Stakeholder Landscape

The Toolbox captures and maps the Platform Business Model with its Ecosystem in a holistic Stakeholder Landscape.
Toolbox Equipment Overview

1) Canvas Card

A Canvas Card is used to describe a Stakeholder and his requirements.

2) Interaction Card

An Interaction Card is used to describe an exchange relationship between Stakeholders and Partners and can be categorized in “Money, Data and Goods”

3) PDF Cards

PDF Cards illustrate Platform Design Factors (PDFs) and serve as a Guideline to (further) fill Canvas and/or Interaction Cards.
The purpose of this tool

Understand the dynamics of a platform-based business model.

Create business model prototypes!

Get the big picture: Understand the perspective of all stakeholders.

Focus on details: Create alternative options for platform elements (e.g. pricing options: “pay by x”).

Define your role in an industry ecosystem: What can a platform do for you, but also what can you do for the ecosystem?
We use **AirBnB** as an ongoing Example to directly apply the following explanations and directions

**Airbnb is a platform for people to list, discover, and book accommodations**

- Founded in August of 2008 and based in San Francisco, California, Airbnb is a **peer-to-peer online marketplace and homestay network** enabling people to list, discover, and book accommodations around the world – online or from a mobile phone or tablet – at any price point.

- And with a strong customer service and a growing community of users, Airbnb is the easiest way for people to monetize their extra space and showcase it to an audience of millions.

- 2,000,000+ Listings

- 60,000,000+ Guests

- 34,000+ Cities in 191+ Countries

Source: https://www.airbnb.com/
Toolbox Equipment 1/3: Canvas Card

The Business Model Canvas

Key Partners
- Who are our key partners?
- What is their role?

Key Activities
- What are the key activities in our value proposition?
- Which are the most important value drivers?

Value Propositions
- How do we deliver value to customers?
- How do we solve customer problems?

Customer Relationships
- What is the nature of the relationship with customers?
- How do we keep customers happy?

Customer Segments
- Who are our target customers?
- What are their needs?

Key Resources
- What key resources are needed for our value proposition?
- How do we acquire these resources?

Channels
- How do we distribute our value proposition?
- How do we reach our customers?

Revenue Streams
- How do we generate revenue from our value propositions?
- What are our revenue opportunities?

Cost Structure
- What are our main costs?
- How do we manage our costs?

Canvas Card is used to describe a Stakeholder and its requirements.

Job to be Done
- What is the problem we are solving?
- What is the benefit of using our solution?

Skills
- What skills are required to deliver our value proposition?
- How do we acquire these skills?

Requirements
- What are the requirements for our value proposition?
- How do we meet these requirements?

Reliability
- How are continuous availability and quality of value contributions of a partner secured?
- How resilient is a partner regarding unexpected events?
- How reliable are upstream value creation stages?

Integration
- Which kind of value contribution does the partner add to the network?
- Why should a partner be a part of the value creating network?
- Why is a partner with its value driver(s) or specialized attributes suitable to a specific role within a network?

Value Proposition
- Do necessary competences exist?
- Which kind of processes, capabilities and/or resources is a partner capable to deliver?
- Do prior experiences exist or have other networks been established before?

Integration
- Do the processes and systems match the (technical) interfaces and standards?
- Do the organizational structures provide enough flexibility to be integrated into a network?
- Do these structures meet the required regulatory and ethical standards?
The Canvas Game-Card is used to describe a Stakeholder and its requirements.
Canvas Card Deep Dive: Value contribution

Value contribution is the starting point and should answer the following questions:

- Which kind of value contribution does the partner add to the network?
- Why should a partner become / stay a part of the value creating network?

Possible value contributions are:

- Production of physical goods or services
- Delivery to a Point of Sale
- Sales to end customers
- Development and operation of an internet platform
- Programming of software
- Acquisition of critical business intelligence data
- Gathering and analysis of usage data or customer feedback
- etc.

After mapping the value contribution landscape of all potential partners, it is important to assess whether

- the generated network provides a real (and novel) added value?
- the network is feasible and viable (abstracted from the possibility of implementation)?
AirBnB as an example: Value contribution

The **Value contribution** of AirBnB contains efficient mediation between housing providers and travelers worldwide.

**Partner:** AirBnB  
**Role:** Platform Provider

- Efficient mediation of short time rentals between housing providers and travelers
- Find “cool” accommodation
- Help me with extra $$
**Canvas Card Deep Dive: Value driver**

**Value driver:** Value drivers are capabilities, processes and resources a network partner should possess to deliver its value contribution within the network.

**Potential value drivers are:**
- Specialized competences/capabilities
- Process know-how
- Access to exclusive networks or data sources
- Access to production facilities and data centers
- etc.

A focal company should identify **which value drivers are necessary to establish and operate the developed network.**

For network development, a focal company should answer the following questions:

- Why is a partner with its value driver(s) or specialized attributes suitable to a specific role within a network?
- Are necessary competences available?
- Which kind of processes, capabilities and resources is a partner capable to deliver?
- Are already networks established or prior experiences present in relevant areas?

Partners who want to **link themselves to an existing network** should critical assess which of their own existing value drivers increase the possibility to contribute and collaborate!
AirBnB as an example: Value driver

The **Value drivers** of AirBnB are to manage and analyze its homestay network.

- **Input Dimension**
  - Efficient mediation of short time accommodations between housing providers and travelers etc.
  - Platform operation; Data storage, analysis, filtering and curation
  - Community management
  - Large marketing budget
  - Lobbying

- **Output Dimension**
  - Partner: AirBnB
    - Role: Platform Provider

**Skills**
Canvas Card Deep Dive: **Integration**

It is necessary to consider the required **technical interfaces and organizational structure**, which are needed for the integration of a partner into the network.

A company that wants to **prepare for the participation** in a network has to think about its **embedding ability**:

- Are the processes and systems compatible with the (technical) interfaces and standards that are expected by a platform operator?
- Are the organizational structures flexible enough to be integrated into the added value of a network in the short term (right up to the real-time integration, for example by micro-integration)?
- Have agreements been made with the employees and the employees’ representatives, which reconcile the need for flexibility in the processes with the needs of the employees for continuity?
- Are regulatory and ethical requirements met?

**Potential integration points are:**
- (Open) APIs
- Connectivity (Communication Interfaces)
- Access to database
- File sharing, Share-Point
- Compliance
- Data as Payment
- etc.
AirBnB as an example: Integration

The Integration of AirBnB with its partners requires strong interfaces.

- Efficient mediation of short time accommodations between housing providers and travelers
- Platform operation; Data storage, analysis, filtering and curation
- Community management
- Large marketing budget
- etc.

- Peer-to-peer online marketplace and connection technologies
- Feedback interfaces
- Communication interface
- etc.

- Platform operation; Data storage, analysis, filtering and curation
- Community management
- Large marketing budget
- etc.

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VDI Industry 4.0 Canvas
Canvas Card Deep Dive: Reliability

Potential reliability points are:
- Agreements on terms and conditions
- Regulated privacy
- Continuous provision
- Guarantees
- Flexible processes and work streams
- etc.

When developing a platform business model it is relevant to investigate:
- How secure is the continuous availability of value contributions from a partner?
- How is a continuous quality of value contributions guaranteed?
- How flexible they can be adapted if necessary?
- How resilient is a partner in terms of unexpected events?
- How reliable are upstream value creation stages?

In networks with short-term and at short-notice relations, strong assessment and feedback systems are necessary.

Reliability: Digital value networks require flexibility and resiliency to be able to react on change in the business environment and trust and motivation for successful collaboration.
AirBnB as an example: Reliability

In order to enable strong **Reliability** in the network, AirBnB ensures property insurance and safeguarding of all transactions.

**Reliability**

External Value Proposition

- Property insurance
- Safe billing and transaction system
- Regulated booking
- Terms of Conditions
- etc.

**Integration**

Internal processes

- Peer-to-peer online marketplace and connection technologies
- Feedback interfaces
- Communication interface
- etc.

**Value contribution**

- Efficient mediation of short time accommodations between housing providers and travelers
- etc.

**Value driver**

- Platform operation; Data storage, analysis, filtering and curation
- Community management
- Large marketing budget
- etc.

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VDI Industry 4.0 Canvas
AirBnB as an example: Other Stakeholders

Create a canvas for all other stakeholders connecting via AirBnB, too.

Here: Hosts and tenants.

Other AirBnB stakeholders would be:
- Cities
- Travel sites
- Cleaning services
- Tours
- Craigslist
Toolbox Equipment 2/3: Interaction Card

The Interaction Card is used to describe a exchange relationship between Stakeholders and Partners and is categorized in “Money, Data and Goods”.

Specific exchanged value items

Exchange category
AirBnB as an example: Interaction

From AirBnB’s point of view, the company has a variety of exchange relations i.e. **Interaction** as arrows coming from or directing towards them.
The final Landscape will include all different Stakeholders

- Accommodation information
- Capacity
- Tenant rating
- Usage data
- …

- Payment
- Information about potential tenants
- Insurance service

- Efficient mediation of short time accommodations between housing providers and travelers
- etc.

- Peer-to-peer online marketplace and connection technologies
- Feedback interfaces
- Communication interface
- etc.

- Platform operation: Data storage, analysis, filtering and curation
- Community management
- Large marketing budget
- etc.

- Provision of available accommodation capacity
- Accommodation rating
- Host rating
- Arrival info via App.

- Trust and Safety
- Guaranteed availability of rent object
- Accepted Terms of Conditions of host
- etc.

- Communication Interfaces
- Transaction System
- Host Log-In
- etc.

- Budget for Travelling and renting
- Internet Access/App with Log-In
- etc.

- Payment of host
- Service fee
- Accommodation rating
- Self information (Facebook page)

- Accommodation capacity

- Property insurance
- Safe billing and transaction system
- Regulated booking
- Terms of Conditions
- etc.

- Offering of Room, Apartment or House
- High-quality description and photos of rental object
- etc.

- Owning/Permanent Renting of a place and allowance to sub-rental
- Internet Access/App with Log-In
- etc.

- Provision of available accommodation capacity
- Accommodation rating
- Host rating
- Arrival info via App.

- Feedback interfaces
- Communication interface
- etc.

- etc.

- etc.
PDF Cards illustrate Platform Design Factors (recurring best practice configurations) and serve as a guideline to (further) fill Canvas and/or Interaction Cards.
The four types of PDFs matching the design of a platform-based business model

Our theoretical Platform Model contains four design areas, which have to be modelled and can be enhanced by our Platform Design Factors (PDFs).

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<td>Peripheral</td>
<td>User</td>
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Use PDF Cards to fill/add to Canvas & Interaction Cards

**Platform Infrastructure**

A **Infrastructure PDF Card** describes how activities are structured and linked to core and peripheral components.

**Platform Value**

Value Creation & Capture PDF Cards refer to the selection of activities that are performed within a business model.

**Platform Governance**

A **Governance PDF Card** refers to who performs and governs activities and how it is proceeded.
AirBnB can be described with 4 main PDFs

Peer-to-Peer

In this model the core value proposition of the company is the mediation between its customers. The company offers a market place, where people can connect and offer and/or demand products/services.

Uber, Mobility provider by connecting Users
The multinational online transportation network company offers with its app a platform, where it connects consumers with trip requests and Uber drivers, who use their personal cars. Although the company does not own any vehicles or other mobility assets, it has become one of the biggest mobility providers.

Ebay, Online sales platform and marketplace
By offering a consumer-to-consumer and business-to-consumer sales platform, ebay became a multibillion-dollar business. It offers next to its auction-style sales also “buy-it-now” shopping and provides its customers with shipping and payment services.

Runtastic, Fitness app and platform with social network
Besides its core services as a mobile fitness app, Runtastic also offers social networking and elements of gamification as a service e.g. the comparison or competition with a friend.

AirBnB’s core structure is a Peer-to-Peer market place. Hosts and Tenants use the platform to meet. To enable this, AirBnB has to set the right interfaces.
AirBnB can be described with 4 main PDFs

**Value creation**

AirBnB creates value by making more of it – not in a direct way, but by enabling others, i.e. hosts, to do so:

- **Utilizing existing capacities** (accommodation) when not used by the regular owner/tenant.

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### Make more of it

**Ideas, Patents and other (Know-How) assets in the company are not only used to create core products/services, but are also themselves treated as products/services, which can be offered to other companies.**

Doing so, slack or dormant resources can generate additional revenue streams.

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**Requirements of Stakeholder:**

- Know-How assets, such as patents, ideas, process knowledge etc.

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**Porsche, Manufacturing-process and IT consulting services**

Besides its core business of producing and selling cars, the traditional German automotive player is offering several other services and products related to its own production processes. Porsche offers manufacturing-process and IT consulting services for businesses and development tools and software for its suppliers.

**Amazon Web Services, Provider of cloud infrastructure**

Building on its experience in offering a variety of online services, Amazon Web Services sells horizontally and vertically integrated cloud infrastructure as well as development and implementation tool kits for individual own-customized solutions.

**Festo Didactic, Support in technical education and competence development**

The engineering-driven German industrial control and automation company Festo is offering with its subsidiary Festo Didactic an holistic provider of equipment and solutions for technical education and competence development.
AirBnB can be described with 4 main PDFs

**Long Tail**

The focus of this model is on niche products. These niche products on their own are not as profitable as popular products in particular nor demanded highly. But offered in a great multitude of different products ("long tail") and in a certain amount, the small profits add up to significant amount.

**Requirements of Stakeholder:**
- Providing a platform with multitude of offerings in high variety

---

AirBnB captures value with the Long Tail strategy.

They get only a small amount of fee for each booking, but mediate these bookings in a great multitude.

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**Value capture**

- **YouTube, Video-sharing website**
The American video-sharing website allows users to view and upload videos of any topic mainly for entertainment purposes alongside many forms of interaction. One key to the company’s success is the variety of (niche-) topics. With that broad range of available topics, YouTube worldwide attracts an enormous amount of views on its website and is able to generate high revenues by placing (specific) advertisements.

- **Ebay, Online sales platform and marketplace**
As the largest online auction site, ebay offers the opportunity of disposition of any products and services for both, private and professional sellers. Ebay is making a fairly high figure of sales with a high number of goods that aim at a small target market and can be described as niche products with low margins.

- **Netflix, On-Demand Television Network**
Being active in the video-on-demand industry, Netflix offers entertainment content using video streaming technology in exchange for subscription fee. With more than 200.000 movies, series and TV-shows available and over 80 million paying users, Netflix is the largest company of its branch and has gained shares by (among others) offering a lot of exclusive (niche) series.
AirBnB can be described with 4 main PDFs

Social Contract/ Norms

Companies provide an overarching collective goal for the platform ecosystem, a sort of shared identity that defines the character of the platform ecosystem and rallies users around it.

**Uber**
Mobility platform Uber provides its users with community guidelines. These include standards for appropriate behavior, kindness and safety for interactions online as well as for the actual ride.

**Wikipedia**
Wikipedia, the world’s largest open source encyclopedia is self-governed by its community. They set up policies and guidelines which are enforced by the community itself.

**Airbnb**
The peer-to-peer housing platform published hospitality standards for its host and guidelines for responsible behavior for its community.

AirBnB’s governance builds on Social Norms that hosts and tenants have to follow to ensure quality.

They do so by setting standards and appeal to users to consider common goal and benefits.
OUR TASK FOR THE NEXT 15 MIN

Let’s co-create an ecosystem around an open Internet of Manufacturing Platform like Predix, MindSphere, Axoom …

Model a canvas and interaction arrows for the stakeholder assigned to you
OUR TASK FOR THE NEXT 15 MIN

Let's co-create an ecosystem around an open Internet of Manufacturing Platform like Predix, MindSphere, Axoom …

Model a canvas and interaction arrows for the stakeholder assigned to you

**Output per table:**
- One canvas, two or more interaction arrows
Our joint result
Design Factors of Digital, Platform-based Business Models
NOTE

This list of Platform Design Factors is work in progress.

We greatly appreciate your feedback on the design factors:

– Are some missing that are crucial for your business?
– Do you have a great example missing here?

Contact us at piller@time.rwth-aachen.de
PDF Overview

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<th>Platform Value Creation</th>
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<td>(Digital) Add-on</td>
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<td>(Digital) Condition monitoring</td>
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<td>Layer Player</td>
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<td>Pay per use</td>
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<td>Push to Pull</td>
<td>Razor and (digital) blade</td>
<td>Open Business Modell</td>
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# Platform Value Creation

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<tr>
<th>Platform</th>
<th>Description</th>
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<tbody>
<tr>
<td>(Digital) Lock-In</td>
<td>The client is actively “locked in” a product environment by the company. This is achieved by high switching costs. The lock-in stands for a sensor-based, (digital) handshake/ authentication mechanism and limits compatibility to competitor-systems, constrains imitations and ensures warranty service.</td>
<td>46</td>
</tr>
<tr>
<td>Condition monitoring</td>
<td>The company’s offering is a service based on the constant, real-time measuring and monitoring of condition and process data of a product or a machine and its environment. The collected data can be on the one hand used to optimize processes or the product/machine itself and on the other hand to offer relevant value-adding services.</td>
<td>48</td>
</tr>
<tr>
<td>Connection as a service</td>
<td>Old devices (regarding information technology) are connected to modern communication infrastructure by adding new hardware. The upgrade allows the continuous use of optimal set old devices and its functionality and obviates a complete new purchase decision process.</td>
<td>50</td>
</tr>
<tr>
<td>Gamification</td>
<td>Gamification is a method, which motivates people to act more intense in certain interactive settings. It transfers game-typical elements and processes into these settings and helps e.g. to increase the customer/partner loyalty or to support certain behavior and productivity-increase of coworkers.</td>
<td>52</td>
</tr>
<tr>
<td>Go Offline</td>
<td>This model describes the idea of enabling any encounter where customers and business physically engage in an offline Customer Touch Point to exchange information, provide a service, or handle transactions.</td>
<td>54</td>
</tr>
<tr>
<td>Guaranteed Availability</td>
<td>The availability and functionality of a product or service is guaranteed by the company. The offering changes from the product itself to the job to be done and downtime is reduced. To achieve guaranteed availability, the offering of a product is extended by services and the product itself by sensors and M2M.</td>
<td>56</td>
</tr>
<tr>
<td>Layer Player</td>
<td>A layer player company focuses his value proposition on one single step (layer) in many different value chains. Doing so it serves with one product or service several different companies, industries and markets and benefits from economies of scale and high quality due to specialization.</td>
<td>58</td>
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<td>Platform Value Creation</td>
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<td><strong>Leverage customer data</strong></td>
<td>Companies leveraging customer data benefit from using and/or selling collected customer data either directly or indirectly by preparing and enhancing the data in a beneficial way. They can offer individualized services of higher value and can increase quality and relevance.</td>
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<tr>
<td><strong>Make more of it</strong></td>
<td>Ideas, Patents and other Know-How assets in the company are not only used to create core products/services, but are also themselves treated as products/services, which can be offered to other companies. Doing so, slack or dormant resources can generate additional revenue streams.</td>
<td></td>
</tr>
<tr>
<td><strong>Push to Pull</strong></td>
<td>Instead of actively offering the customer products via sales channels (push), a system is installed, which provides the customer comfort, but also causes him to actively ask for follow ups (pull). This system is often an inventory management automatism.</td>
<td></td>
</tr>
<tr>
<td><strong>Recommender Engine</strong></td>
<td>A recommender engine does not only capture online patterns of the customer but also actively predicts their interests. This information is used to suggest new and/or complementary products and services the customer might also be interested in.</td>
<td></td>
</tr>
<tr>
<td><strong>Sensor as a service</strong></td>
<td>The sensory data of e.g. a plant are collected, prepared and offered to third parties against payment of a fee. Not the data-generating product or service is the key offering, but the data itself and therefore high margins can be achieved.</td>
<td></td>
</tr>
<tr>
<td><strong>Social curation</strong></td>
<td>The platform gives users incentives to curate the platform data. This can be done for example through ratings, comments, hashtags or simple like buttons. By giving feedback users improve data quality with additional information. Using these, the platform can improve its search results and filters to offer a better user experience.</td>
<td></td>
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</tbody>
</table>
# Platform Value Capture

<table>
<thead>
<tr>
<th><strong>Platform Value</strong></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Digital) Add-on</td>
<td>While the base offering is priced very low, the product/service bundle can be expanded by the customer, who actively chooses additional features that mark the price up. The customer benefits from a modular and adaptable offer and pays more than initially assumed.</td>
<td>74</td>
</tr>
<tr>
<td>(Digital) Subscription</td>
<td>Instead of buying a product or service, the customer has to subscribe and pay a regular fee in order to gain access/use the product or service. The company generates a more steady revenue stream and can plan ahead, the customer can get a markdown and saves transaction costs.</td>
<td>76</td>
</tr>
<tr>
<td>Auction</td>
<td>In this concept the price of a product or service is set by the customers’ bids. The product will be sold if an end time is reached or if there is no one who outbids the highest offer. The company uses the advantages of gamification and benefits from exploiting the highest willingness to pay.</td>
<td>78</td>
</tr>
<tr>
<td>Crowd-funding</td>
<td>This model is a form of crowdsourcing and of alternative finance and describes the practice of funding a venture or project by raising (smaller) monetary contributions from a large number of people, esp. for new product development.</td>
<td>80</td>
</tr>
<tr>
<td>Flat-Rate</td>
<td>In this model the customer pays a fixed fee for the unlimited use of a service. The customer therefore does not lose control of his costs while consuming unrestrictedly. The company gains among others secure income, calculability, uncomplicated billing and easy communicability in advertisements.</td>
<td>82</td>
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</table>
## Platform Value Capture

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Freemium</td>
<td>The initial base version of a product/service is offered for free attracting high volume of customers. Certain customer segments are then persuaded to pay for the premium version or other purchases. Paying customers generate the revenue, which also cross-fines the free offering.</td>
<td>84</td>
</tr>
<tr>
<td>Long Tail</td>
<td>The focus of this model is on niche products. These niche products on their own are not as profitable as popular products in particular nor demanded highly. But offered in a great multitude of different products (&quot;long tail&quot;) and in a certain amount, the small profits add up to significant amount.</td>
<td>86</td>
</tr>
<tr>
<td>Merchandising</td>
<td>Generating an additional revenue stream by offering space/slots/opportunities where other parties can place their advertisements.</td>
<td>88</td>
</tr>
<tr>
<td>Pay per use</td>
<td>In this method of charging, the effective usage of the product or service is measured and billed accordingly (e.g. per piece or time period). This model creates flexibility for the customer, which can be charged more expensively.</td>
<td>90</td>
</tr>
<tr>
<td>Razor and (digital) blade</td>
<td>A real base product (“razor”) does not unfold its usability and/or operability until an extra real or virtual component (“blade”) is added. While the razor is priced competitively low or offered for free and generates an ecosystem with low purchase barriers and high switching costs, the (digital) blade is expensive and sold at high margins, cross-financing the razor.</td>
<td>92</td>
</tr>
</tbody>
</table>
# Platform Infrastructure

<table>
<thead>
<tr>
<th><strong>API</strong></th>
<th>An application programming interface (API) is a set of subroutine definitions, protocols, and tools for building applications. A good API makes it easier to develop an app by providing building blocks, which are then put together by the programmer. By providing APIs, platform owners are able to achieve a high engagement of external developers while maintaining a clear and modular platform architecture.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital Supply Chain</strong></td>
<td>Existing non-digitalized processes along the value chain from the supplier to the client are replaced by digital solutions. Doing so cost-, time- and quality can be optimized, transparency increased and complexity reduced. Value is generated by efficiency-increase.</td>
</tr>
<tr>
<td><strong>Filter</strong></td>
<td>A filter is an algorithmic, software-based tool used by the platform to enable the exchange of appropriate value units between users. A well-designed filter ensures that platform users receive only value units that are relevant and valuable to them; a poorly-designed filter (or no filter at all) means users may be flooded with units they find irrelevant and valueless, which may drive them to abandon the platform.</td>
</tr>
<tr>
<td><strong>Peer-to-Peer</strong></td>
<td>In this model the core value proposition of the company is the mediation between its customers. The company offers a market place, where people can connect and offer and/or demand products/services.</td>
</tr>
<tr>
<td><strong>Shop-in-Shop</strong></td>
<td>In addition to present retails or as a core strategy, the company may integrate its offerings in a way that imitates a small shop within the infrastructure of another shop, creating a win-win situation for both the host, who can attract more customers overall, and the hosted company by gaining cheaper access to a beneficial location.</td>
</tr>
<tr>
<td><strong>Software Development Kit</strong></td>
<td>A Software Development Kit (SDK) is a package that includes programming code, compiler and usually the instructions on how to use it, allowing the programmer to implement software that runs on a specific operating system or hardware.</td>
</tr>
</tbody>
</table>
## Platform Governance

<table>
<thead>
<tr>
<th>Algorithmic Control Mechanism</th>
<th>Architectural control is performed through the application of programming codes and algorithm detecting good and bad behaviour based on specific rules.</th>
<th>112</th>
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<tbody>
<tr>
<td>Content Monitoring</td>
<td>Content monitoring describes the practice of systematically and continually observe and analyze the content on the platform in order to maintain the platforms terms of use.</td>
<td>114</td>
</tr>
<tr>
<td>Decision Rights Partitioning</td>
<td>Decision Rights Partitioning defines how decision rights are split between the platform owner, managers and component developers corresponding to the following aspects.</td>
<td>116</td>
</tr>
<tr>
<td>Democracy</td>
<td>Democracy is an extreme form of Decision Rights Partitioning. Platform owners assign all decision rights to the community of developers and users.</td>
<td>118</td>
</tr>
<tr>
<td>Formal Control</td>
<td>Formal control refers to explicit rules e.g. the terms of service drafted by lawyers or the rules of stakeholder behavior drafted by the platform's designers. These laws moderate behavior at both the user and the ecosystem level and can target the input, process or output.</td>
<td>120</td>
</tr>
<tr>
<td>Gatekeeping</td>
<td>Companies using predefined objective acceptance criteria for judging what apps, developers, users and contributors are allowed into a platform’s ecosystem.</td>
<td>122</td>
</tr>
</tbody>
</table>
# Platform Governance

<table>
<thead>
<tr>
<th><strong>Informal Control</strong></th>
<th>This type of governmental tool highly benefits from the platform community developing norms, cultures, and expectations to guide the behavior of participants.</th>
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<tbody>
<tr>
<td><strong>Insurance</strong></td>
<td>Platforms use market mechanisms such as insurance to reduce risk for their participants and thereby maximize overall value creation.</td>
<td>126</td>
</tr>
<tr>
<td><strong>Integrator</strong></td>
<td>Choosing this model of governance, the company increases its vertical value chain integration and keeps the control over all resources and capabilities. Doing so it gains efficiency, economies of scope and lower dependencies from suppliers.</td>
<td>128</td>
</tr>
<tr>
<td><strong>Market Control</strong></td>
<td>Governance through markets is based on mechanism design and the provision of incentives. Mechanisms are established in order to e.g. provide an optimal policy to encourage the generation and sharing of intellectual property or to help each other.</td>
<td>130</td>
</tr>
<tr>
<td><strong>Open Business Modell</strong></td>
<td>Companies following an Open Business Model actively enable and enhance collaborations with partners and use these as the main way to create value. They constantly search for new ways to work together with suppliers, providers of complements or customers.</td>
<td>132</td>
</tr>
<tr>
<td><strong>Open Source</strong></td>
<td>Software companies following the open source model make their source code freely accessible, hardware companies open technology details, patents etc. Others can use it for free and/or contribute to the product/service. Money can be earned with complimentary services.</td>
<td>134</td>
</tr>
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</table>
## Platform Governance

<table>
<thead>
<tr>
<th>Platform Governance</th>
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</thead>
<tbody>
<tr>
<td><strong>Orchestrator</strong></td>
<td>Choosing this model of governance, the company reduces its vertical value chain integration and focuses solely on core competencies, gaining economies of scale. Other up- or downstream value chain segments are outsourced and actively coordinated.</td>
<td>136</td>
</tr>
<tr>
<td><strong>Rating System</strong></td>
<td>By having an integrated rating or review system of the available products/services on the platform, a quick overview on quality and experience of other customers can be provided. Users get access to ratings and rankings in the marketplace.</td>
<td>138</td>
</tr>
<tr>
<td><strong>Risk Pooling</strong></td>
<td>Platforms use market mechanisms such as risk pooling to reduce risk for their participants and thereby maximize overall value creation. They do so by grouping and splitting the (e.g. financial or supply) risk over a large pool of participants.</td>
<td>140</td>
</tr>
<tr>
<td><strong>Social Contract</strong></td>
<td>Companies provide an overarching collective goal for the platform ecosystem; a sort of shared identity that defines the character and code of conduct of the platform ecosystem and rallies users around it.</td>
<td>142</td>
</tr>
<tr>
<td><strong>Social Sustainability Seal</strong></td>
<td>Focusing on a sustainable supply chain or putting an effort into resolving social or economical issues that are related to its interests, a company can benefit from a positive image and have a positive impact on the topic.</td>
<td>144</td>
</tr>
</tbody>
</table>
This list of Platform Design Factors is work in progress

Selected PDF Cards
(Digital) Subscription

Instead of buying a product or service, the customer has to subscribe and pay a regular fee in order to gain access/use the product or service. The company generates a more steady revenue stream and can plan ahead, the customer can get a markdown and saves transaction costs.

Requirements of Stakeholder:

- Scalable product/service

Limmex, Producer of emergency call wristwatches

Limmex offers high-quality wristwatches with an integrated emergency call function. By pushing one button, the owner can call for assistance. The built-in GPS-tracker will guarantee to locate the watch precisely and an additional loudspeaker and microphone allow further communication with a person previously selected. To use this service, the user will be charged subscription fees.

Microsoft, Developer of office software

Microsoft’s software for office applications is dominant on the market place. In exchange for a monthly or yearly payment, the software package will be free to use in regards to its terms of use and keeps itself up to date. As needed, the customer is flexible to add more users and upgrade the services. The Subscription model generates a constant flow of income.

Apple iTunes

By providing a free-of-charge-product, such as the software iTunes, Apple is continuously generating sales by charging a subscription fee for continued access to new music in its streaming service “Apple music”. It is not transferable to other media players so that the customer would lose access to his or her put-together music collection by switching the player.
Flat-Rate

In this model the customer pays **a fixed fee for the unlimited use** of a service. The customer therefore does not lose control of his costs while consuming unrestrictedly. The company gains among others secure income, calculability, uncomplicated billing and easy communicability in advertisements.

**Requirements of Stakeholder:**
- scalable services/products
- availability of the services/products to any promised extend

---

**Netflix, Entertainment platform**
Offering more than 200,000 movies, series and TV-shows, Netflix is the largest company of its branch. To get access to the content, the consumer can chose to pay a monthly fee that is fixed, irrespective of the amount of consumed material, or having to see advertisements regularly.

**Vodafone, Provider of mobile communications**
Based on a two-year-contract, the customer pays a fixed monthly fee to use his or her mobile device for the appointed services unrestrictedly. Any further taken services will be charged additionally. While easy for the customer to use and to overview the costs, Vodafone benefits from a constant revenue stream and valuable information about patterns of use of the customer.

**Deutsche Bahn, Provider of personal transportation**
To use the transportation services of DB with no limits (within the appointed restrictions), the customer agrees on fixed regular payments, e. g. for a monthly or yearly pass. DB benefits from a constant revenue stream while the customer benefits from the simple cost structure.
**Freemium**

The initial base version of a product/service is offered for free attracting high volume of customers. Certain customer segments are then persuaded to pay for the premium version or other purchases. Paying customers generate the revenue, which also cross-fines the free offering.

**Requirements of Stakeholder:**

- Possibility to offer a base product/service for free
- Addable/ customizable upgrades to the base product/service

---

**Skype, Platform for free video communication**

The application Skype offers in its basic version free video chat and call services. By paying fees the user gains access to additional features and is enabled to call a landline or mobile phone number.

**Spotify, Provider of music streaming services**

The music streaming service was launched as a free version and penetrated the market gaining high market volume. After showing its customers the benefits of an advertisement-free holistic version of the product the company started offering a premium version for a monthly subscription fee.

**Gaming Apps, Free to play – pay to progress (faster)**

Most of the gaming apps for Smartphones are offered for free. Within the app, players are asked and motivated to complete in-app purchases to upgrade to a premium version or to enable additional features and the 100% gaming experience.
Pay per Use

In this method of charging, the effective usage of the product or service is measured and billed accordingly (e.g. per piece or time period). This model creates flexibility for the customer, which can be charged more expensively.

Requirements of Stakeholder:
- scalable product/service
- Measurement system for number/time/… of usage
- Dynamic billing systematic

Daimler Car2Go, Car-Sharing Service
Daimler's Car2Go Car-Sharing-Concept offers usage and billing exact to the minute. The customer does not pay a monthly fee and does not have to determine specific details for the rent in advance, but is flexible in time and place of pick-up and dropping point.

Google, Web Search Engine
Google offers with its Google AdWords a "Pay-per-Click" solution for online advertisement. Customers do not pay for placing the ad, but only for every click, which users make on the advertisement.

Rolls Royce Holdings, Aviation power systems manufacturer
Rolls Royce started offering its turbines by the concept of "power-by-the-hour". Airlines don’t buy the product itself anymore, but the flight-hour. Rolls Royce offers maintenance, service etc. and the airlines don’t need to store spare parts.
A filter is an algorithmic, software-based tool used by the platform to **enable the exchange of appropriate value units between users**. A well-designed filter ensures that platform users receive only value units that are relevant and valuable to them; a poorly-designed filter (or no filter at all) means users may be flooded with units they find irrelevant and valueless, which may drive them to abandon the platform.

**Uber, Platform connects users to close by drivers**
The mobility app ensures with its filter that ride offers are relevant for users. The app only shows drivers which are close to the user and can reach him in an acceptable time.

**Nike, Social network provides suitable workout programs**
Nike is a sportswear and apparel company that also offers its customers to be part of the Nike+ community. This platform consists of different apps, for example the Nike+ Training Club. In this app users can state their current fitness level and their training goals. Based on this information a filter shows suitable workout programs.

**Facebook, Provider of user based (social media) news**
The social network Facebook uses his news feed algorithm to filter the news for every user based on his actions and interests in the past. As a result of this users are not flooded with information and see only what is relevant to them. Over time the algorithm understands the specific user needs better and improves the filter even more.
In this model the core value proposition of the company is the \textit{mediation between its customers}. The company offers a marketplace, where people can connect and offer and/or demand products/services.

\begin{itemize}
\item \textbf{Uber, Mobility provider by connecting Users} \\
The multinational online transportation network company offers with its app a platform, where it connects consumers with trip requests and Uber drivers, who use their personal cars. Although the company does not own any vehicles or other mobility assets, it has become one of the biggest mobility providers.

\item \textbf{Ebay, Online sales platform and marketplace} \\
By offering a consumer-to-consumer and business-to-consumer sales platform, ebay became a multibillion-dollar business. It offers next to its auction-style sales also “buy-it-now” shopping and provides its customers with shipping and payment services.

\item \textbf{Runtastic, Fitness app and platform with social network} \\
Besides its core services as a mobile fitness app, Runtastic also offers social networking and elements of gamification as a service e.g. the comparison or competition with a friend.
\end{itemize}
Software Development Kit

A Software Development Kit (SDK) is a package that includes programming code, compiler and usually the instructions on how to use it, allowing the programmer to implement software that runs on a specific operating system or hardware.

Windows, SDK for Windows Apps
The latest SDK for Windows 10 includes all interfaces, data and tools to allow the user to develop applications for this operating system.

Firefox, Development through open source SDK
The company of Firefox, known for its webbrowser, widely used SDK as an open source to progress and improve its services and additional optional programs called Add-ons. Private and professional programmers were free to use the SDK to suggest improvements or offer Add-ons of their own.

Matlab, Compiler SDK for interfaces
The commercial software of the American company MathWorks is widely used to solve mathematical problems and for graphical representation of the results. Furthermore the provided Compiler SDK allows to implement interfaces with C++, Java and Python programs.
Algorithmic Control Mechanism

Algorithmic control is performed through the application of programming codes and algorithms detecting good and bad behavior based on specific rules.

Amazon, Product review control
Amazon detects false, misleading and/or automated product reviews, which could potentially give unfair advantages/disadvantages to sellers/buyers. By several mechanisms, such as report buttons, captcha codes etc., human interaction is verified.

Zopa, Peer-to-peer lending platform
By replacing the traditional loan officers with software algorithms, Zopa not only managed to provide more than one billion US Dollars in loans, but also significantly reduce its loan default rate. The algorithms would use both, conventional and nontraditional data such as a Yelp rating (for restaurants) i.a., to calculate a borrower’s likelihood of repaying.
Content Monitoring

Content monitoring describes the practice of systematically and continually observe and analyze the content on the platform in order to maintain the platform's quality, usability, and terms of use.

Facebook, Social media platform
To ensure that users follow the terms of use on its social media platform, Facebook integrated a constant content monitoring. Unwanted content like pornographic material or hate speech can be deleted and the author can be admonished or banned from the website.

Pinterest
To avoid unwanted content on its platform, Pinterest is scanning its content mainly based on users feedback as users can report unwanted content.

Twitter
Based on user feedback and on internal algorithms, Twitter is constantly scanning and editing the content on its platform. Users who don’t follow the terms of use can be admonished and banned.
Decision Rights Partitioning

Decision Rights Partitioning defines how decision rights are split between the platform owner, managers and component developers corresponding to the following aspects.

Apple, Provider of the platform Apple App Store
While Apple, as the provider of the platform Apple App Store, keeps strategic decision rights to be able to control the general outcome, it decentralized apps decision rights so that independent app developers can find their own solutions and business ideas in mobile Applications.

Bosch, OEM Automotive
An OEM like Bosch develops and manufactures important parts for the automotive production. While the settings of these parts are very specifically set in a contract between the two companies, Bosch keeps its rights to produce them in a way it believes is best.
Democracy

Democracy is an extreme form of Decision Rights Partitioning. Platform owners assign all decision rights to the community of contributors and users.

Wikipedia
Wikipedia, the world's largest open source encyclopedia is self-governed by its community. They set up policies and guidelines which are enforced by the community itself.

Linux
Linux is a computer operating system assembled under the model of free and open-source software development and distribution. The underlying source code may be used, modified and distributed - commercially or non-commercially - by anyone under the terms of its respective licenses, such as the GNU General Public License.

OpenStack, Cloud Software
OpenStack is a free and open-source software platform for cloud computing, mostly deployed as an infrastructure-as-a-service. The development of the software is managed by the technical committee - an elected group that represents the contributors to the project, and has oversight on all technical matters.
Formal control refers to **explicit rules** e.g. the terms of service drafted by lawyers or the rules of stakeholder behavior drafted by the platform’s designers. These **laws moderate behavior** at both the user and the ecosystem level and can target the input, process or output.

**ebay, Seller review system**
In order to sell products on ebay’s platform, the seller has to follow the general terms and conditions of the ebay marketplace. So the seller has to manage an account and gets rated from the customers regarding customer services, quality of the products etc. The reviews will be displayed openly on the sellers account and will substantially contribute to the sellers success.

**Apple, Sharing Rule of User**
At the user level, there is the Apple rule that allows a user to share digital content among up to six devices or family members prevents unlimited sharing while nonetheless providing economic incentives for the purchase of Apple services and making a reasonable amount of sharing convenient.

**Apple, Rule for Compelling App Developers**
At ecosystem level, the rule for compelling app developers of Apple to submit all code for review, combined with the rule that releases Apple from any duty of confidentiality, allows Apple to proliferate best practices.
Informal Control (Crowd Curation)

This type of governmental tool highly benefits from the platform community developing norms, cultures, and expectations to guide the behavior of participants.

Wikipedia, Community driven web encyclopedia
While Wikipedia provides the platform, the whole content on its website is generated by private persons, who will not receive payment for their work. Because all the content remains editable, the community keeps it up to date and free from falsification and bad behavior/content.

iStockphoto, Market for crowdsourced photographs
As the biggest marketplace for crowdsourced photographs, iStockphoto installed the system of crowd curation, where, by uploading quality content, members can earn the status to become inspectors. Thereby members of the community would take care of unwanted content.
Choosing this model of governance, the company increases its vertical value chain integration and keeps the control over all resources and capabilities. Doing so it gains efficiency, economies of scope and lower dependencies from suppliers.

**Ford**
To foster and grow its mass production, Ford became highly integrated in the early 1900’s by starting to produce its own vehicle components and buying the steel producer Mills.

**Zara**
The Spanish clothing and accessories retailer Zara manufactures most of its clothing itself in Spain and nearby countries. While other competitors benefit from cheap production in Asia, Zara is enabled by its high vertical integration to strongly reduce the time to market and save costs by just-in-time production.

**Exxon Mobil**
The US-American oil and gas company has a highly vertical integrated value chain, which includes the production, processing and refinement of oil.
Market Control (Social Currency)

Governance through markets is based on mechanism design and the provision of incentives. Mechanisms are established in order to e.g. provide an optimal policy to encourage the generation and sharing of intellectual property or to help each other.

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**HYVE, Incentivizing the innovation process**
Active in the field of design and engineering, HYVE started many idea competitions in cooperation with companies to incentivize innovation processes. Furthermore, the community will review and vote the best ideas on the platform of HYVE, creating a highly dynamic innovation process.

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**SAP, Crowd based support forum for developers**
The software corporation SAP included a system of social currency in its support forum in order to motivate developers to answer each others questions. By doing so, a developer will earn points for his or her company and by reaching a specific level of points, SAP will make a generous contribution to a charity of the companies choice. This system saves tech support costs for SAP while significantly reducing average response time.
Open Source

Software companies following the open source model make their source code freely accessible, hardware companies open technology details, patents etc. Others can use it for free and/or contribute to the product/service. Money can be earned with complimentary services.

Local Motors, Low-volume manufacturing of motor vehicle designs
Local Motors is an American motor vehicle manufacturing company focused on low-volume manufacturing of open-source motor vehicle designs using micro factories. Its core value proposition is based on an open Design network, where engineers can submit and further develop ideas for new vehicles.

Wikipedia, Platform for open encyclopedia
The free online encyclopedia Wikipedia allows its users to create and edit almost any article. Doing so the website became the largest and most popular general reference work on the internet and is ranked as one of the most popular websites.

Kaa, Platform for middleware software for Internet-of-Things (IoT)
Kaa is an open-source Internet-of-Things (IoT) middleware software platform for rapid development of IoT cloud solutions, applications and smart products. It provides an open toolkit and offers features that can be individually plugged in and used for several IoT use cases.
By having an integrated rating or review system of the available products/services on the platform, a quick overview on quality and experience of other customers can be provided. Users get access to ratings and rankings in the marketplace.

**Otto, Customer reviews on products**
The international trade and service group Otto provides a rating system on its shopping website to have customers review their purchased products. Therefore not only offering interesting information on the products to the customers, but also gathering feedback on their trades goods in real time.

**Tripadvisor, Platform for experience reports on holiday trips**
Tripadvisor established one of the leading peer-to-peer review platforms for tourist guides, allowing them to progress their services towards an online tourist agency, connecting positive reviews to options of immediate booking of the tour.

**Yelp, Reviews on local businesses**
Yelp provides peer-to-peer reviews on local businesses from the field of e. g. restaurants, shopping or nightlife on its platform. Business owners have to pay fees to be able to respond on reviews and being able to measure visitor activity on their page.
Social Contract

Companies provide an overarching collective goal for the platform ecosystem; a sort of shared identity that defines the character and code of conduct of the platform ecosystem and rallies users around it.

**Uber**
Mobility platform Uber provides its users with community guidelines. These include standards for appropriate behavior, kindness and safety for interactions online as well as for the actual ride.

**Wikipedia**
Wikipedia, the world’s largest open source encyclopedia is self-governed by its community. They set up policies and guidelines which are enforced by the community itself.

**Airbnb**
The peer-to-peer housing platform published hospitality standards for its host and guidelines for responsible behavior for its community.
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