

# A Network-based Business Model Framework

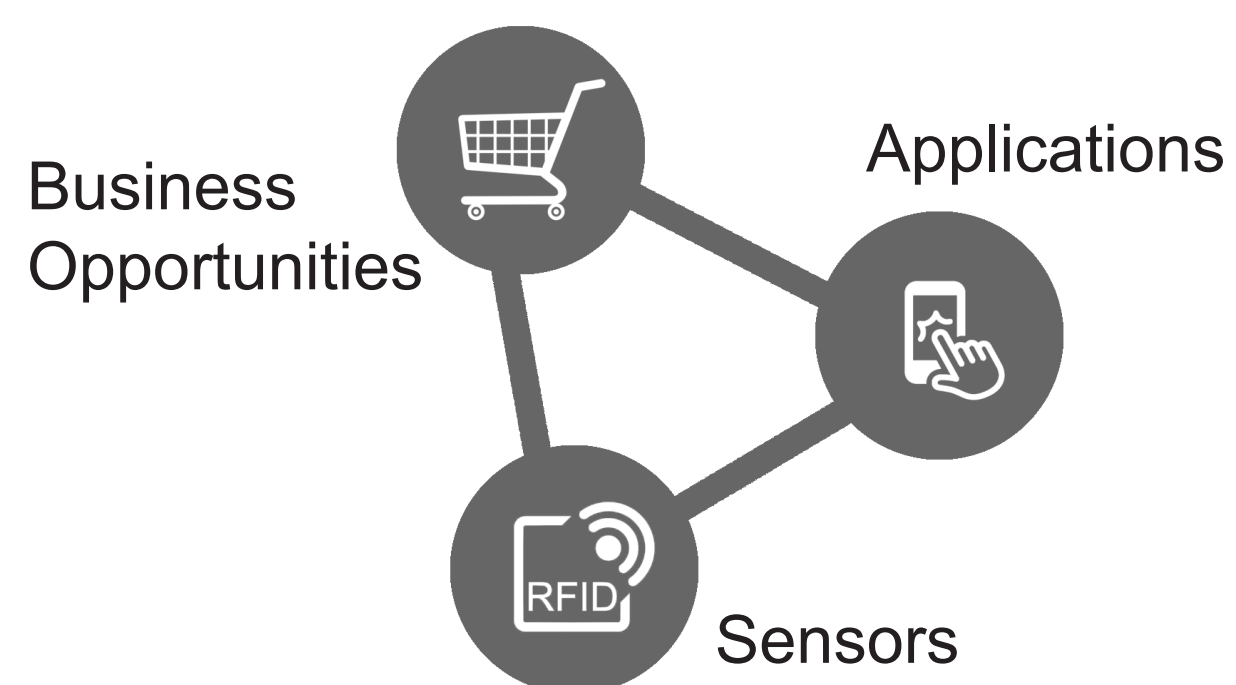
for the Internet of Things

Masterstudium:  
Business Informatics

Thomas Biasion

Technische Universität Wien  
Institut für Informationssysteme  
Arbeitsbereich: Distributed Systems  
Betreuer: Assistent Prof. Dr.-Ing. Stefan Schulte  
Mitwirkung: Christoph Hochreiner

## Connected Solutions in the IoT require Network-based Business Models <sup>[1]</sup>



Spending in the IoT market will increase to \$3000 Billion in 2020 <sup>[2]</sup>

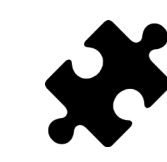
## Research Questions ?

RQ1: How does the IoT industry look like today in terms of the most common business models and constellations of stakeholders?

RQ2: How can a network-based business model be modelled and simulated to foster business model innovation and to increase total value creation?

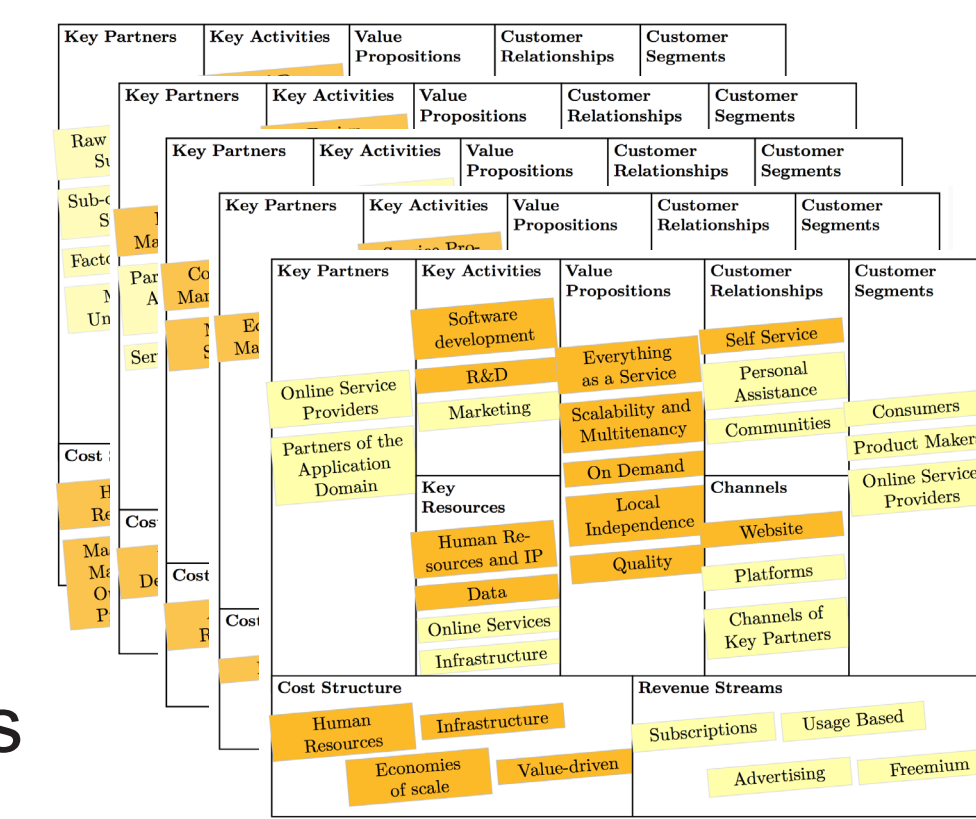
RQ3: What are the most influential constellations of business models in network-based markets?

## State of the Art



Existing business model ontologies are suited to design business models either from a company perspective or from a network perspective

Analysis of five common stakeholders in the IoT by applying the Business Model Canvas



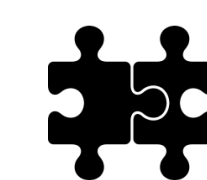
## Approach



Literature Review

Market Research with an existing Modelling Tool

## The Network-based Business Model Framework (NBMF) integrates existing business modelling tools into a coherent workflow



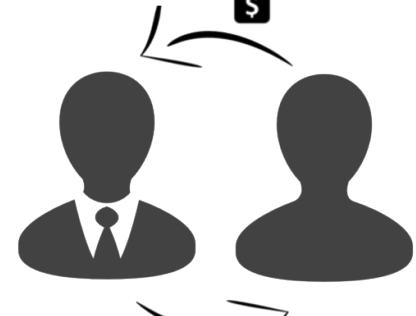
### The 4 Phases

Consumer



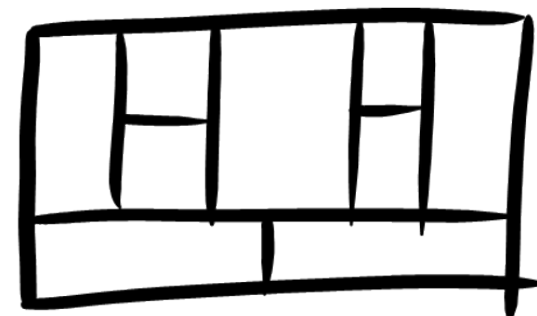
Define the needs of the consumer

Network



Design the solution in a network graph

Stakeholder



Determine core competencies

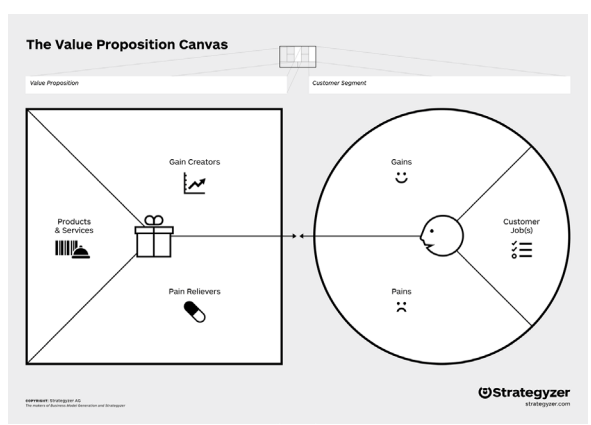
Profitability



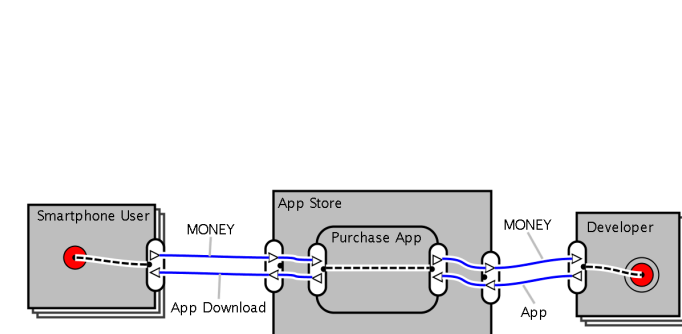
Evaluate business models

... based on

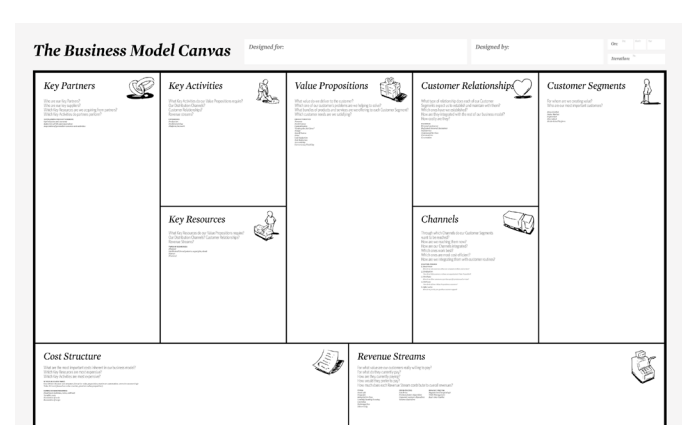
Ideation of the Value Proposition Canvas <sup>[3]</sup>



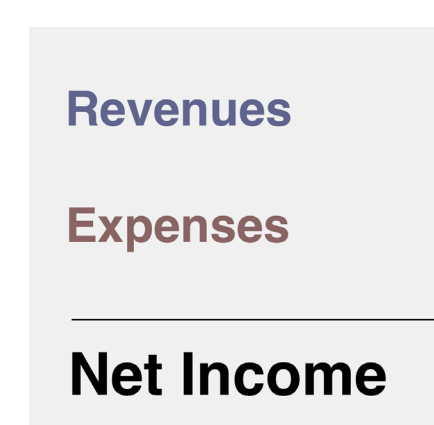
Networking concepts of e3-value <sup>[4]</sup>



Extended relational Business Model Canvas <sup>[5]</sup>



Automated Income Statement <sup>[6]</sup>



Automated Mapping Automated Mapping

### NBMF Foundation

A business modelling workflow, divided into 4 subsequent phases

Switching viewpoints to cover different aspects of business models

11 elements defined in UML enable the mapping between the 4 phases

### NBMF Design Tool

Implementation of the framework as web-application (GUI + Rest API)

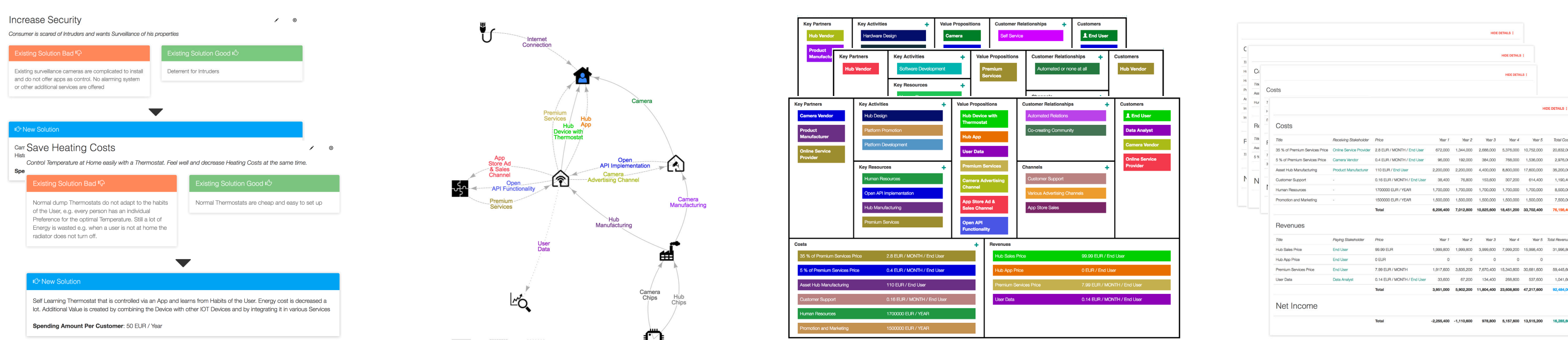
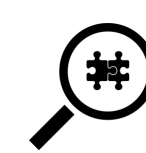


Available at [nbmf.biasion.eu](http://nbmf.biasion.eu)

Theoretical Concept

User Feedback during Development

## Home Automation Case Study with the NBMF Design Tool



The case study describes a network-based business model to realise a home automation ecosystem. Collaborative companies develop a B2C solution by providing a revenue-sharing app store for the IoT.

## Results



Stakeholder roles and business models are still evolving to suit the IoT. Characteristics for business models in the IoT will be: open collaboration of stakeholders, data as key asset, product as a service, platforms and integrators, revenue sharing.

The NBMF is suited to design network-based business models for the IoT. Applicability for other network-based markets has to be investigated in further research.

Explorative-Descriptive Case Study <sup>[7]</sup> with the implemented Modelling Tool

### References

- [1] Stefanie Turber, Jan Brocke, Oliver Gassmann, and Elgar Fleisch. Designing Business Models in the Era of Internet of Things. In International Conference on Design Science Research in Information Systems, pages 17–31. Springer International Publishing, 2014.
- [2] Gartner Inc., Gartner says 6.4 billion connected things will be in use in 2016, up 30 percent from 2015. <http://www.gartner.com/newsroom/id/3165317>, 2015.
- [3] Alexander Osterwalder, Yves Pigneur, Greg Bernarda, and Alan Smith. Value Proposition Design. John Wiley & Sons, 2014.
- [4] Jaap Gordijn. Value Based Requirements Engineering: Exploring Innovative e-Commerce Ideas. PhD thesis, School for Information and Knowledge Systems (SIKS), 2002.
- [5] Alexander Osterwalder and Yves Pigneur. Business Model Generation. John Wiley & Sons, 2010.
- [6] Thomas R. Ittelson. Financial Statements: A Step-by-step Guide to Understanding and Creating Financial Reports. Career Press Inc, 1998.
- [7] Robert K. Yin. Case Study Research: Design and Methods. Sage Publications, 2003.