

2. Basic Patterns and Tools for Lean Startup and Lean Innovation

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[http://st.inf.tu-dresden.de/
teaching/saab](http://st.inf.tu-dresden.de/teaching/saab)

- 1) The Innovator's Toolbox
- 2) Overview of Lean Startup
- 3) Evaluating a Canvas
- 4) Value Proposition Analysis
 - 1) nABC
- 5) Lean Canvas
- 6) Other Canvases
- 7) Innovation Processes

Literature

- ▶ [Osterwalder-PhD]
http://www.hec.unil.ch/aosterwa/PhD/Osterwalder_PhD_BM_Ontology.pdf
- ▶ [Carlson-Wilmot] Curtis R. Carlson, William W. Wilmot. Innovation. The Five Disciplines for Creating what Customers Want SRI International. Crown Business, US, 2006
- ▶ [Oddoy] Manuel Oddoy. Softwareentwicklung mit natürlicher Sprache (“Lean Modelling”), Belegarbeit, TU Dresden, Jan. 2014. Supervised by Christian Wende, www.devboost.de
- ▶ [Korger] Christina Korger. Organisierte Software-Startups mit kollaborativen Canvases. Großer Beleg. TU Dresden, 2014.
 - <http://nbn-resolving.de/urn:nbn:de:bsz:14-qucosa-160539>

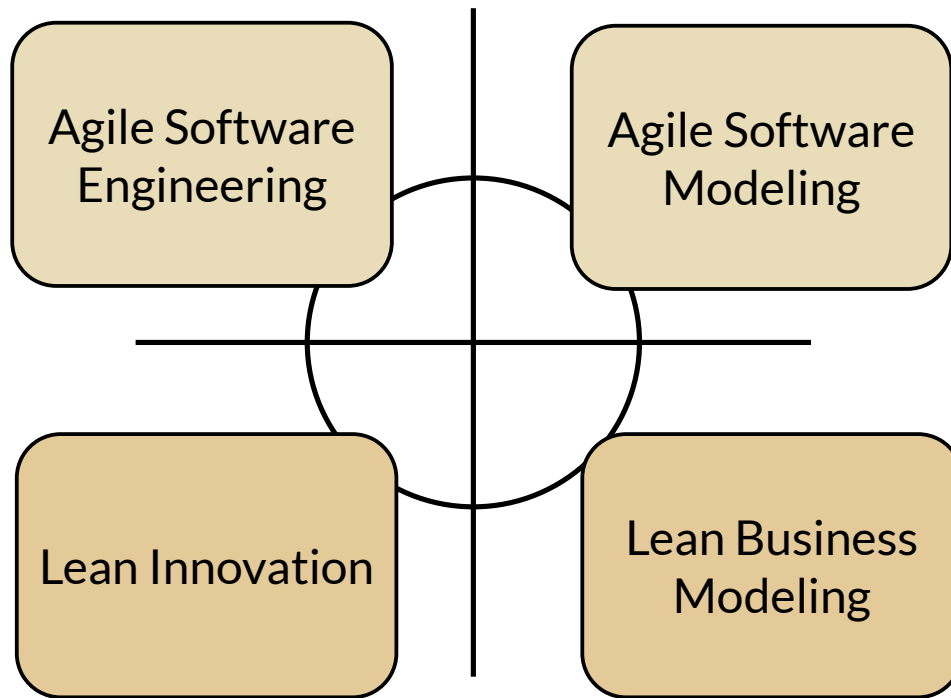
Startup of the Day

- ▶ Boreal builds water cleaning mini-factories
- ▶ <https://www.n-tv.de/wissen/Zwei-Berliner-entsalzen-Wasser-fuer-die-Welt-article22102812.html>
- ▶ <https://winture.de/>
- ▶ KfW Innovation Award
<https://www.kfw.de/KfW-Konzern/%C3%9Cber-die-KfW/KfW-Awards/KfW-Award-Gr%C3%BCnden/2019/>

2.1 The Lean Innovator's Toolbox

Lean = Agile – what does this mean?

Lean or Agile Innovation or What?

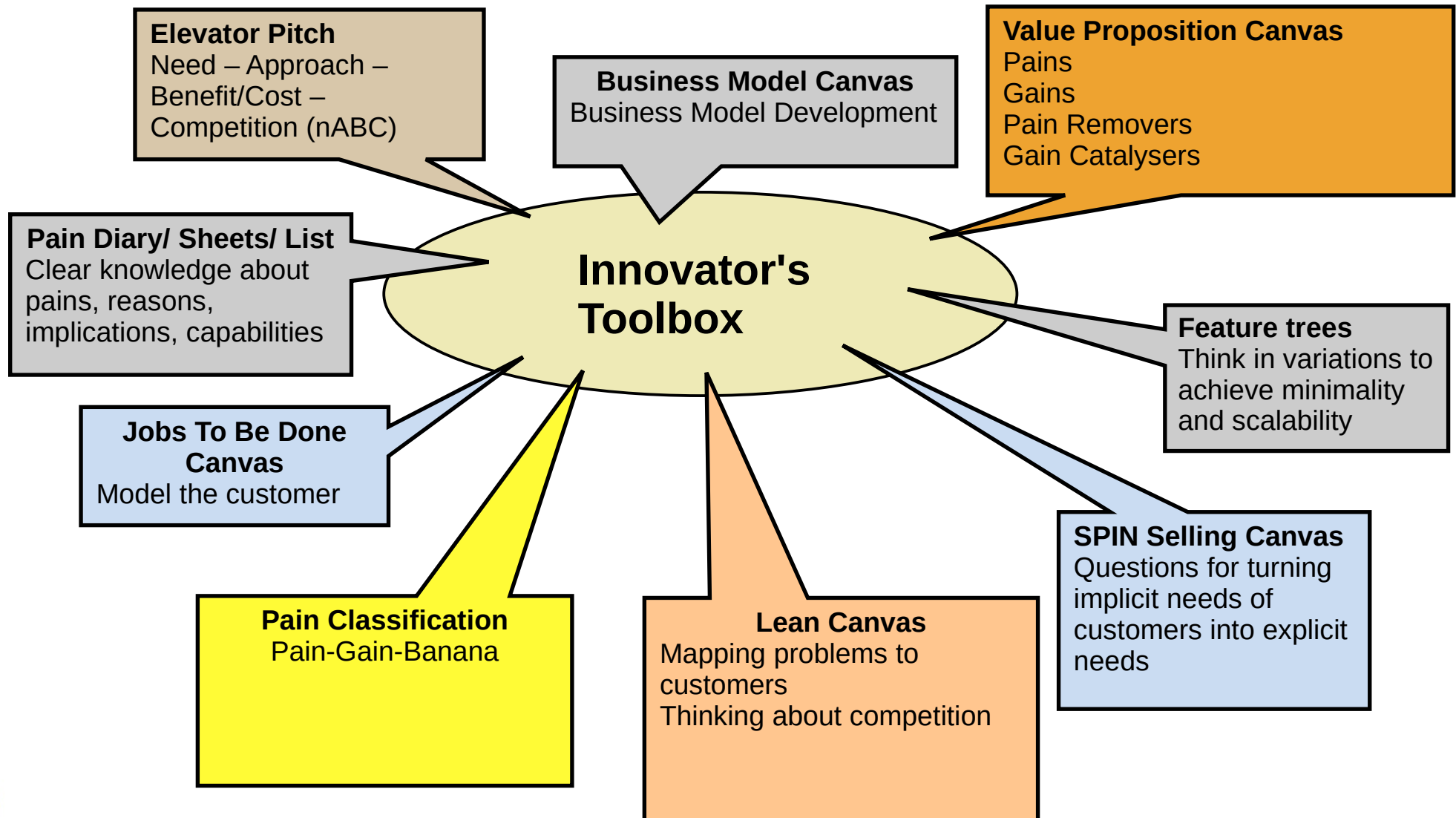


The Lean Innovator's Toolbox

- ▶ Every lean innovator needs a **toolbox** for his products or services he develops
 - Several important artefacts (lean models) are assembled. He/she should know them by heart.
- ▶ In the course, we will discuss these artefacts and how to mature them.
- ▶ The **innovator's toolbox** of this course:
 - NABC Elevator Pitch template (use this for pitches)
 - Working with Canvases (use them for business development)
 - The Business Model Canvas
 - The Value Proposition Canvas
 - The Lean Canvas
 - The Personal BMYou Canvas
 - The Customer Interview Canvas
 - Problem Analysis
 - from Pain Diary to systematic Pain Analysis
 - Selling with good questions

Q1: The Lean Innovator's Toolbox

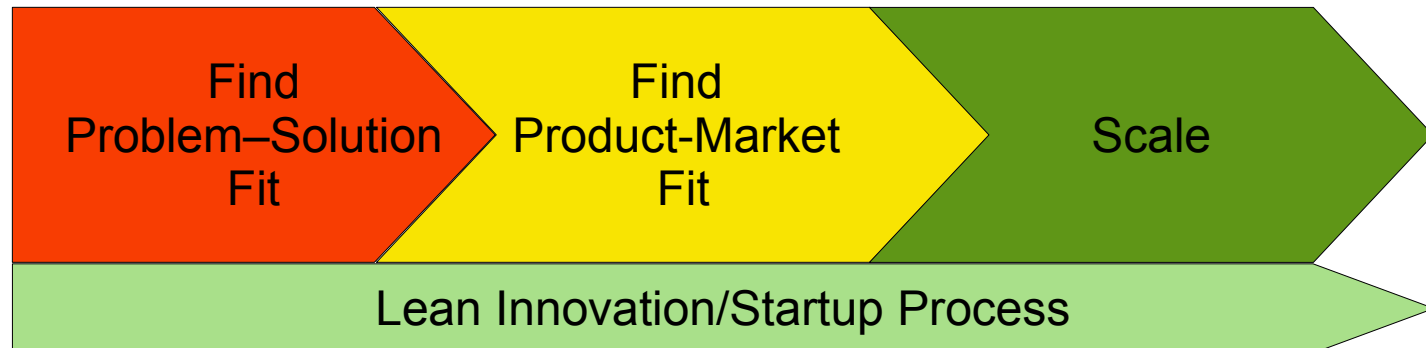
- ▶ Every innovator should have the following artefacts present and mature them over time



2.2 Overview on Lean Startup and Lean Innovation

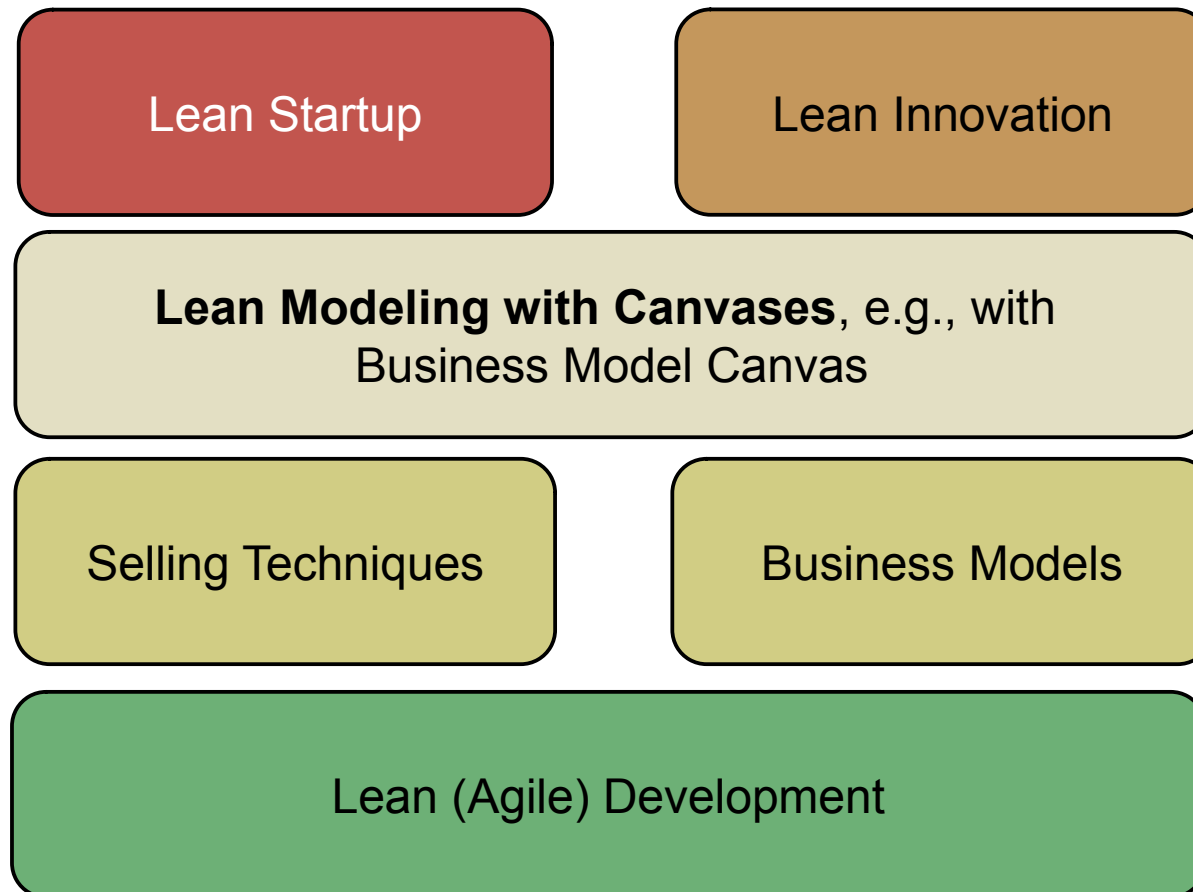
3 Process Steps to Lean Innovation and Startup

- ▶ Find a relevant problem
- ▶ Find a relevant product or service
- ▶ Find a scaling business model
- ▶ *Measure* the maturity of an innovation or startup (how far has it come in the innovation process)
 - By metrics
 - By hypothesis testing with customers (“get out of the building”)



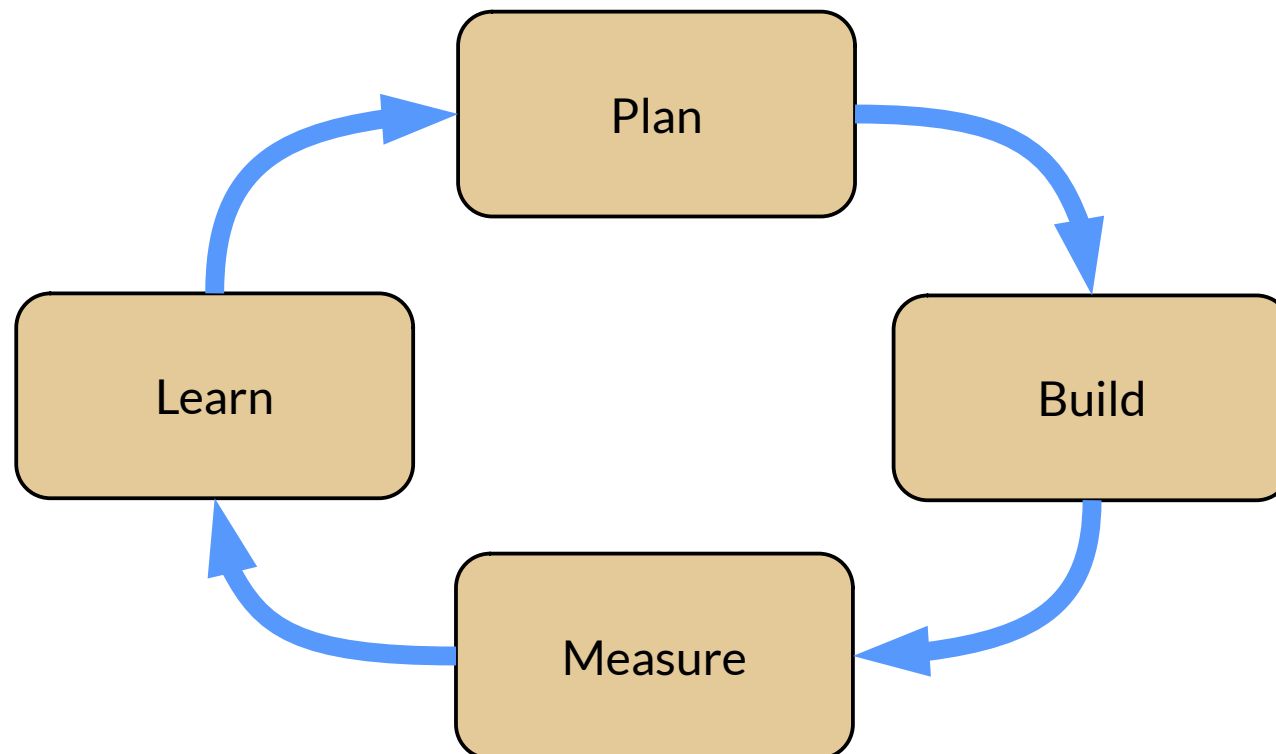
Lean Innovation Process in this Course

- ▶ The **lean innovation process** prototypes early to get early feedback (feedback-oriented process)
- ▶ **Insight: Business can be modeled and metamodeled**



The Lean Innovation (Startup) Spiral Model

- ▶ Instance of “Scientific Method” of Bacon and PDCA (Plan-Do-Check-Act)
- ▶ Plan - Build - Measure - Learn - cycle [Maurya, Ries]
- ▶ Developing “Business Model Canvases” containing “Customer Hypotheses”
- ▶ The “Learn” - “Plan” - “Build” - “Measure” Cycle is a variant of the Scientific Method and the PDCA.



Business Model Generation with BMC Osterwalder/Pigneur

13 Software as a Business

► CC-BY-SA:

http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf

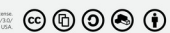
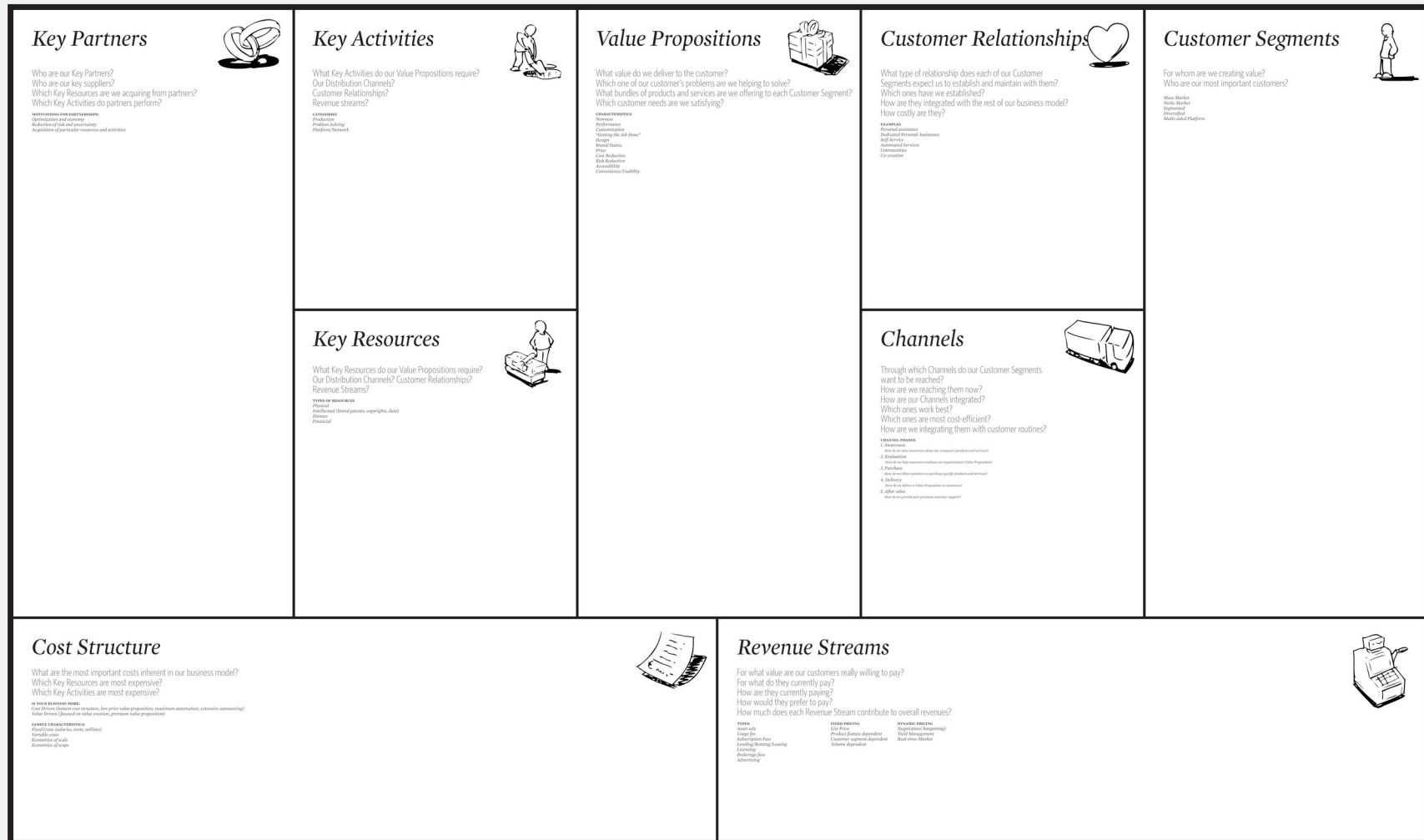
The Business Model Canvas

Designed for:

Designed by:

On: Day Month Year

Iteration: No.



Business Model Analysis with the Business Model Canvas

- ▶ **Business model development** creates business models
 - For start up and placement of new products
 - [Osterwalder/Pigneur] suggest to split the business model in 9 parts, divided by input, output, and in between
- ▶ Input (Resource) Side
 - Cost vs Profit
 - Estimate costs! Cost leadership?
 - Estimate break-even point!
 - Distinguish cash flow and profit
- ▶ Middle: Value Proposition and Pain Killing
- ▶ Output Side (Customer Side)
 - Target customer group
 - Companies? End customers? [champagne]
 - Selling directly or via distributor?
 - Channels
 - Market entry strategy
 - Segmentation of the market

Bridging Two Worlds in BMC

- CC-BY-SA: http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf








The Business Model Canvas

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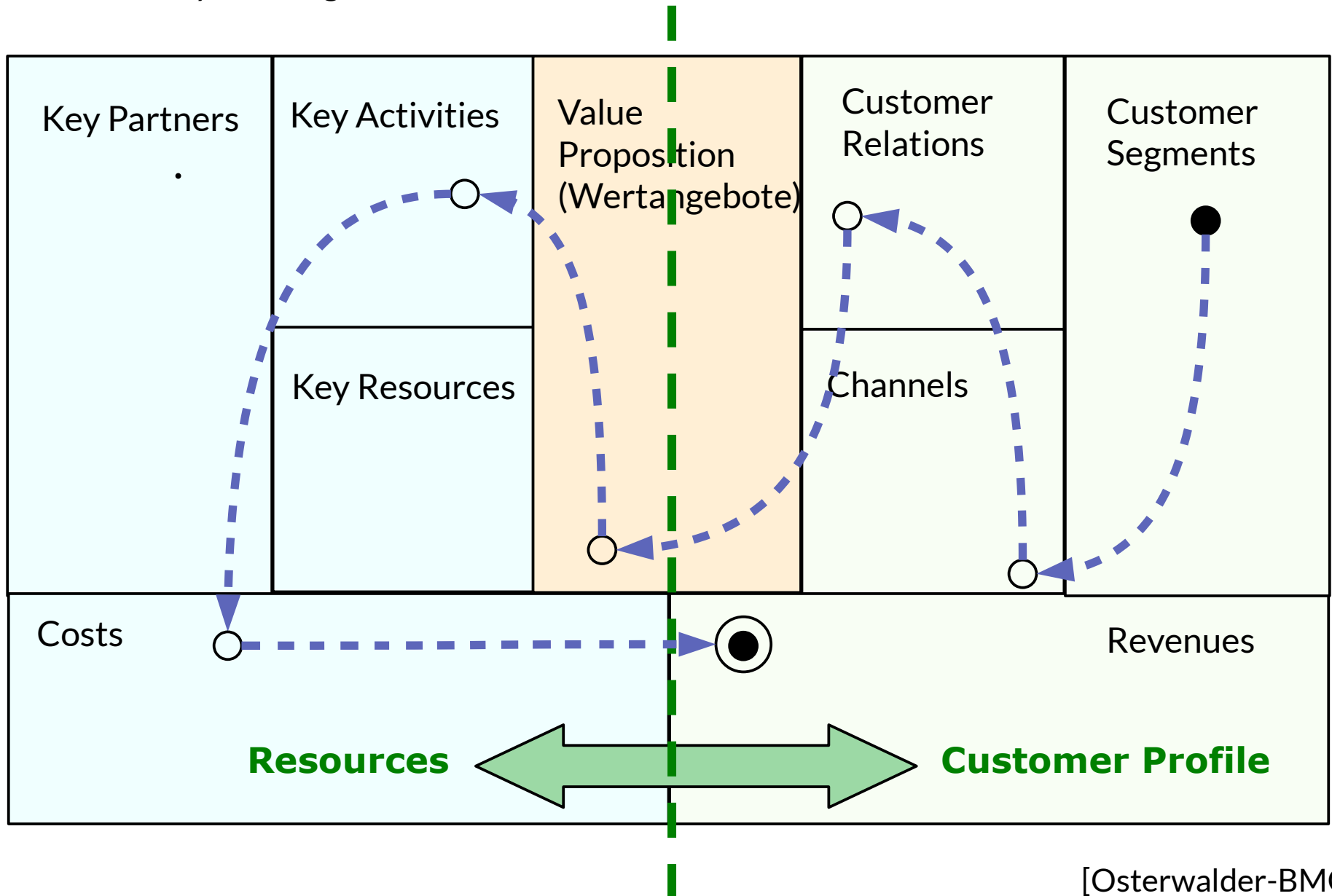
Iteration: No

<p>Key Partners</p>  <p>Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?</p> <p>KEY PARTNERS Distribution channels Manufacturers and suppliers Partners of our suppliers Acquisition of particular resources and activities</p>	<p>Key Activities</p>  <p>What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?</p> <p>KEY ACTIVITIES Production Distribution Platform/Networks</p>	<p>Value Propositions</p>  <p>What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment? Which customer needs are we satisfying?</p> <p>VALUE PROPOSITIONS Performance Customization "Selling the old beer" Design Brand status Price Convenience Risk Reduction Accessibility Convenience/Usability</p>	<p>Customer Relationships</p>  <p>What type of relationship does each of our Customer Segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they?</p> <p>CUSTOMER RELATIONSHIPS Personal assistance Self-Service Automated services Communities Co-creation</p>	<p>Customer Segments</p>  <p>For whom are we creating value? Who are our most important customers?</p> <p>CUSTOMER SEGMENTS Mass Market Niche Market Segmented Individual Multi-Sided Platform</p>
<p>Cost Structure</p>  <p>What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?</p> <p>IN YOUR BUSINESS MODEL: Cost drivers (related to the activities, the price value proposition, acquisition, distribution, channels, activities) Value Drivers (based on value creation, premium value proposition)</p> <p>EXAMPLE COST STRUCTURE: Fixed costs (rent, salaries, utilities) Variable costs Economies of scale Economies of scope</p> <p>RESOURCES</p>	<p>Revenue Streams</p>  <p>For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Stream contribute to overall revenues?</p> <p>REVENUE STREAMS Asset sale Usage fee Subscription Fee Licensing Advertising Brokerage fees Advertising</p> <p>REVENUE STREAMS Licensing Product/service dependent Customer segment dependent Volume dependent</p> <p>REVENUE STREAMS Subscription Usage fee Transaction fee Usage fee Usage fee Usage fee</p> <p>CHANNELS</p> <p>Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?</p> <p>CHANNELS</p> <p>• Direct sales • Indirect sales • Partners (intermediaries, resellers, agents, distributors) • Retailers • Wholesalers • Agents • Franchises • Affiliate sales • Other (e.g., crowdsourcing, peer-to-peer)</p> <p>CUSTOMER</p>			



Business Model Canvas Process

- ▶ Basically from right to left



Lean Hypothesis Testing Cycle in Customer Modeling (Blank/Dorf)

- ▶ **Customer Analysis (Customer Modeling)** is a variant of business model development that creates a trustworthy, realistic model of the customer of the product, his pains, his gains, his desires, her stakeholders, ...
- ▶ During customer modeling, **customer hypotheses** are proposed in form of BMC and validated (Lean Hypothesis Testing cycle, resulting over time in the BMC Cactus).
- ▶ The “Ask” - “Measure” - “Learning” Cycle is a variant of the Scientific Method and the PDCA.

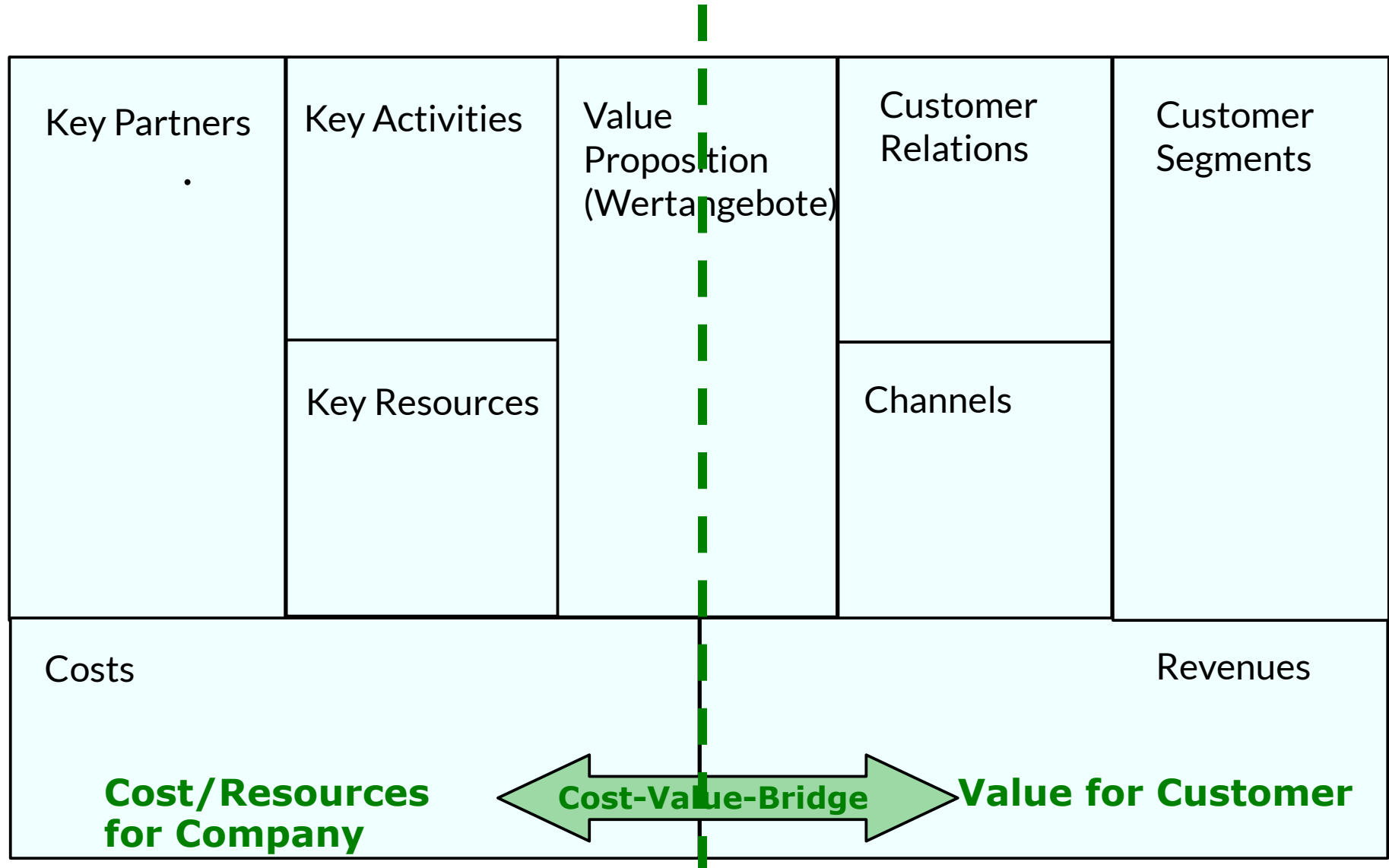


2.3 Canvases and other Analysis Instruments

- Lists, Trees, Link trees, Dags, Graphs, Canvases (planar)

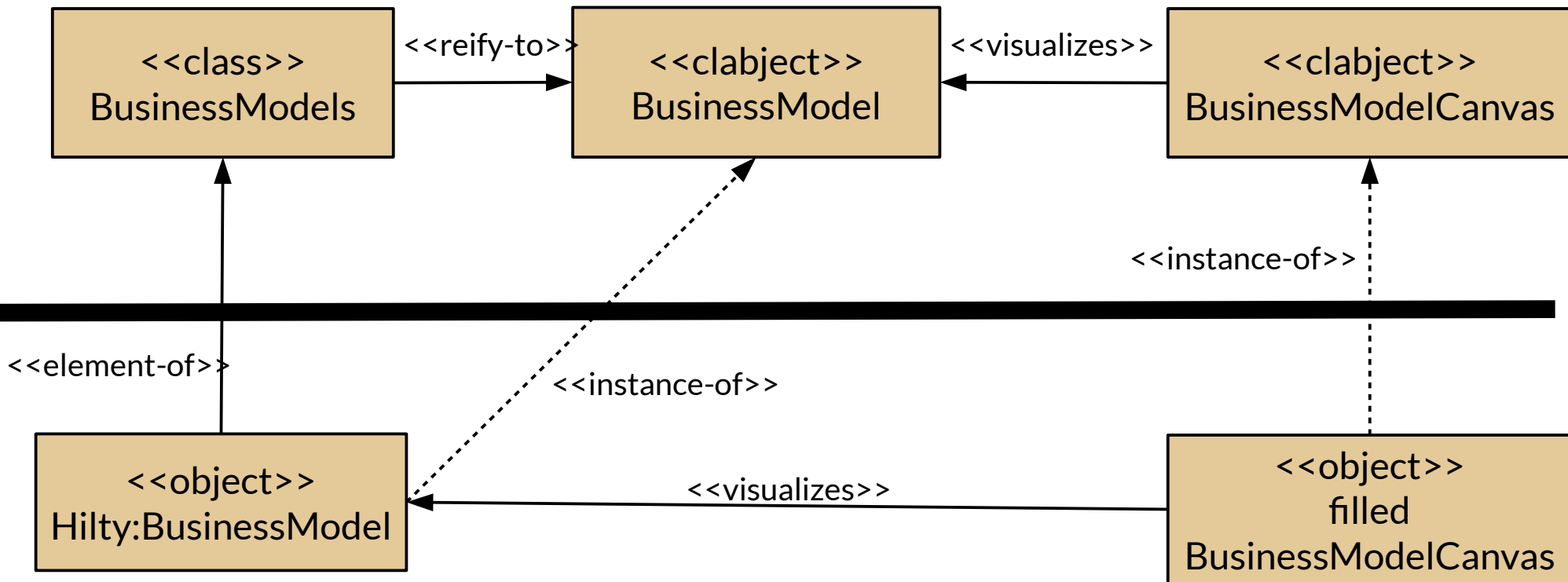
The Modelling Aspect of Business Model Canvas

- ▶ BMC is based on a simple metamodel of business models (see MOST course)
- ▶ Its instances are business models



Metamodels and the BMC

- ▶ One of the central insights of BMC is that a canvas is a *model* following a *metamodel* [Osterwalder PhD], see course “Model-Driven Software Technology (MOST)”



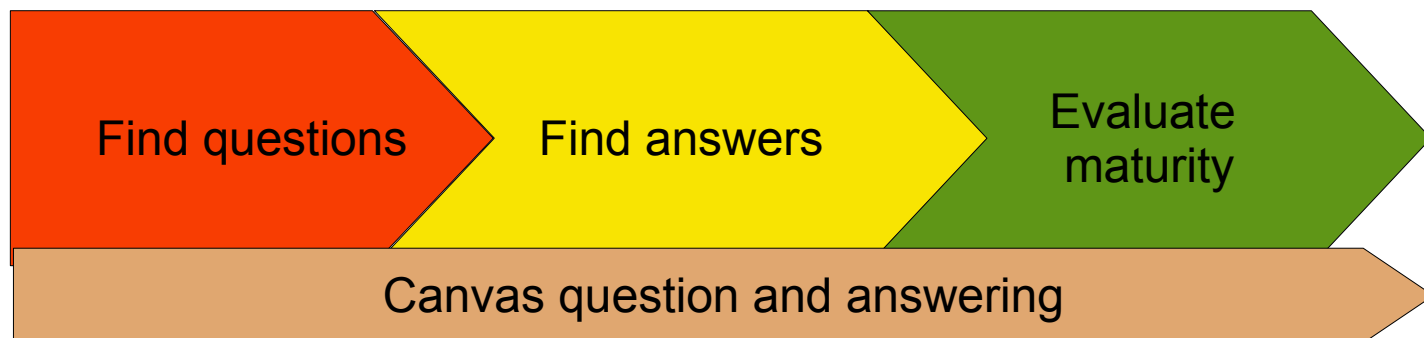
Instruments for Filling Canvases

- ▶ Paper and Notes
- ▶ App
 - <http://www.businessmodelgeneration.com/canvas>
 - <https://strategyzer.com/app>
- ▶ Google docs
 - <http://scrumology.com/how-to-create-a-business-model-canvas-in-google-docs/>
- ▶ **Fridolean platform (LINC)** <https://fridolean.saab18.inf.tu-dresden.de/>
 - Nested canvases
 - Live editing of canvases
 - Linked with RocketChat to discuss online
 - Linked with codiMD to live-edit documents

A **canvas** is a form to collaboratively brainstorm a model.

Canvas question and answering - how to Work with Question-based Canvases

- ▶ Finding answers to the fields of a canvas is easier, if you have defined questions before
 - Some canvases, like the BMC, state pre-defined questions.
 - For others, you have to find questions yourself
- ▶ You can use for questions many methods:
 - the “Honest Serving Men” of Kipling
 - The SWOT “strategic” analysis (strengthes, weaknesses, opportunities, trends)
 - The CoTIQQ cost analysis (cost, time, quality, quantity)
 - The BeNiSiLo improvement analysis (Better, Nicer, Simpler, Longer-lasting)
- ▶ Answers can be quite unrealistic and immature. Evaluate maturity of canvas fields by
 - Asking experts
 - Check cross-constraints
 - Evaluation of metrics



Different Purposes of Canvases

- ▶ A **canvas** has different purposes. It is a model with a metamodel, so it inherits the benefits of the language of its metamodel

Bridging two (left and right) Worlds

- Partner – Customer (BMC)
- Problem – Customer (LC)
- Pain – Pain killer (VPC)

Brainstorm (Q&A) Canvas

- Structured process for excellent elicitation
- Finding answers to the questions
- Brainwalking with many persons

Question-based Canvas

- To generate questions for interviews with customers and stakeholders

Structured Process

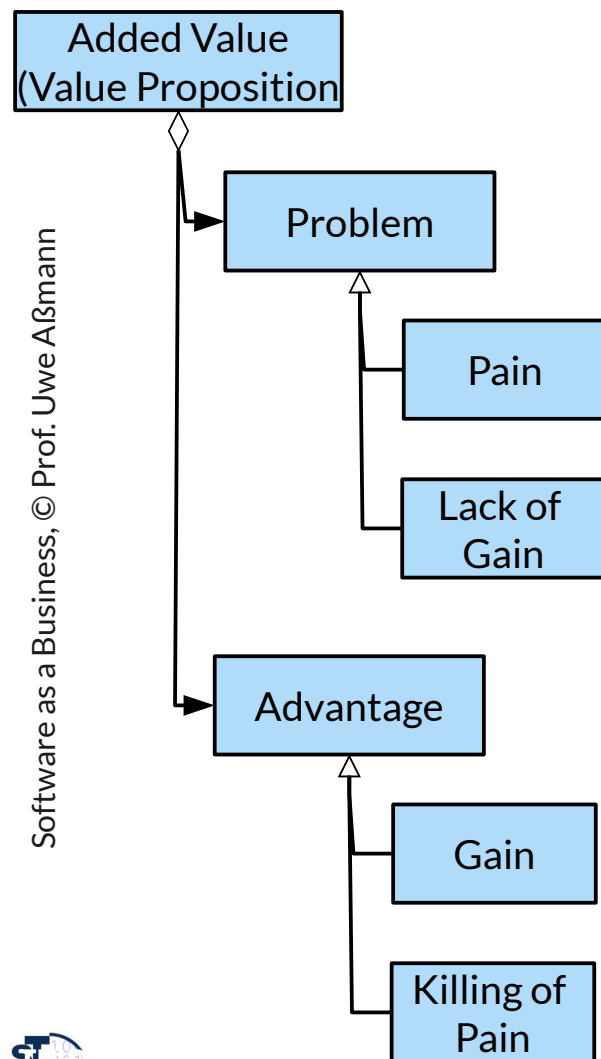
- Use the experiences of metamodels others have collected for you
- Evaluate canvas maturity by asking evaluation questions



2.4 Value Proposition Analysis

Value Proposition (Pain-Gain Analysis) for the Customer

- ▶ **Value proposition analysis** finds a *real problem (pain)* of the customer, or a *real win (gain)*. It is a subprocess of Business model development.



Make sure your innovation is a ***pain killer*** and not just a ***vitamin***.

David Ladd, venture partner at Mayfield Fund
[Carlson/Wilmot]

Pain killers are too dangerous, you only get them on prescription – but we have a large set of ***vitamins***.

[Swedish pharmacist, when Aßmann asked for Korodin Kreislauftropfen]

[Ein Unternehmer] hat einen Spürsinn für das, was die Leute brauchen oder zu brauchen glauben.
Urs Wälterlin. Weit weg im Outback.]

“Pain-Gain” Value Proposition Canvas [Osterwalder]

- ▶ Gains
- ▶ Pains
- ▶ Customer Jobs
- ▶ Gain Creators
- ▶ Pain Relievers
- ▶ Products and services

Download for personal use

http://www.businessmodelgeneration.com/downloads/value_proposition_canvas.pdf

Background:

<http://businessmodelalchemist.com/2012/09/test-your-value-proposition-supercharge-lean-startup-and-custdev-principles.html>

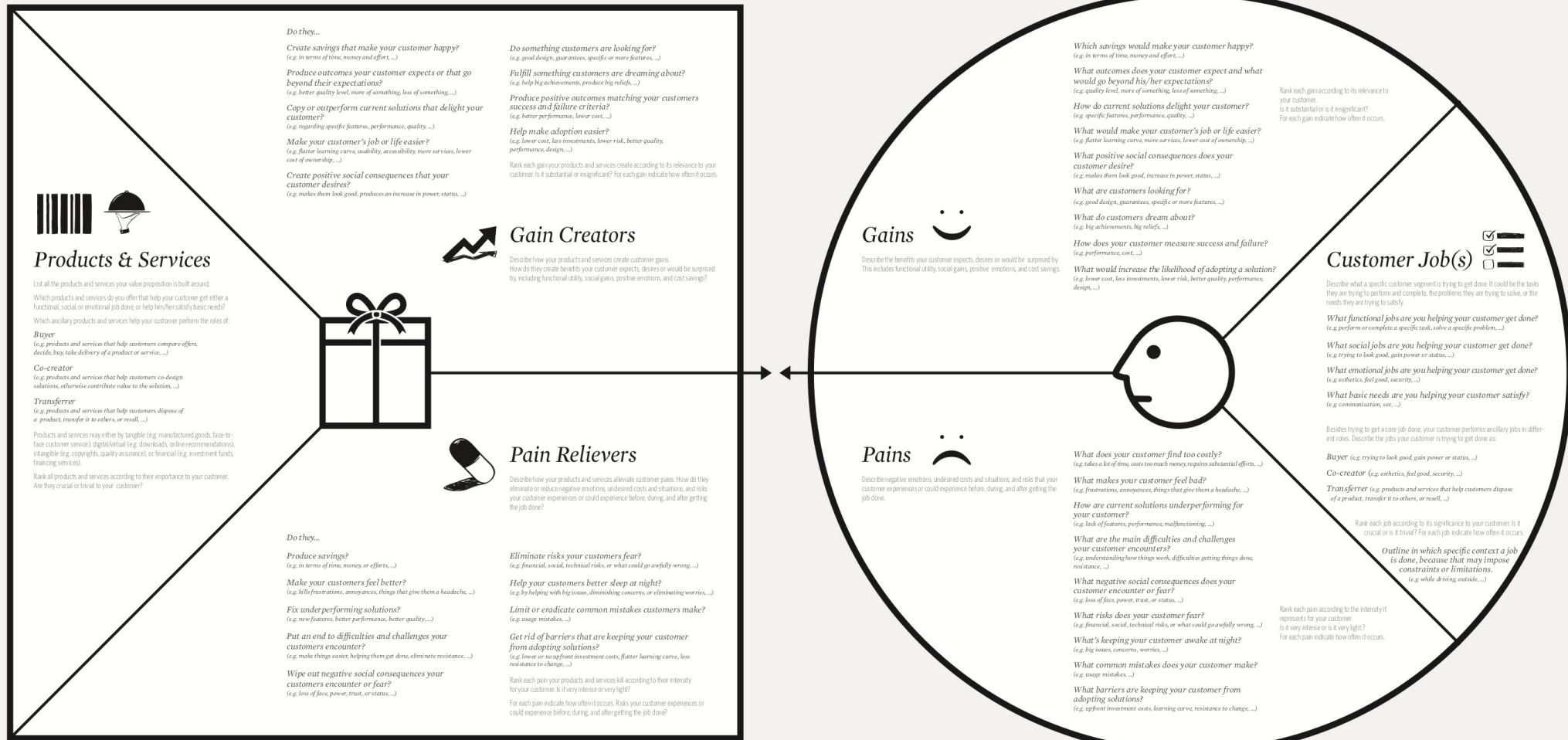
The Value Proposition Canvas

Designed for:

Designed by:

On: Day Month Year

Iteration: No.



Value Proposition

Create one for each Customer Segment in your Business Model

Customer Segment

www.businessmodelgeneration.com

Use in Conjunction with the Business Model Canvas

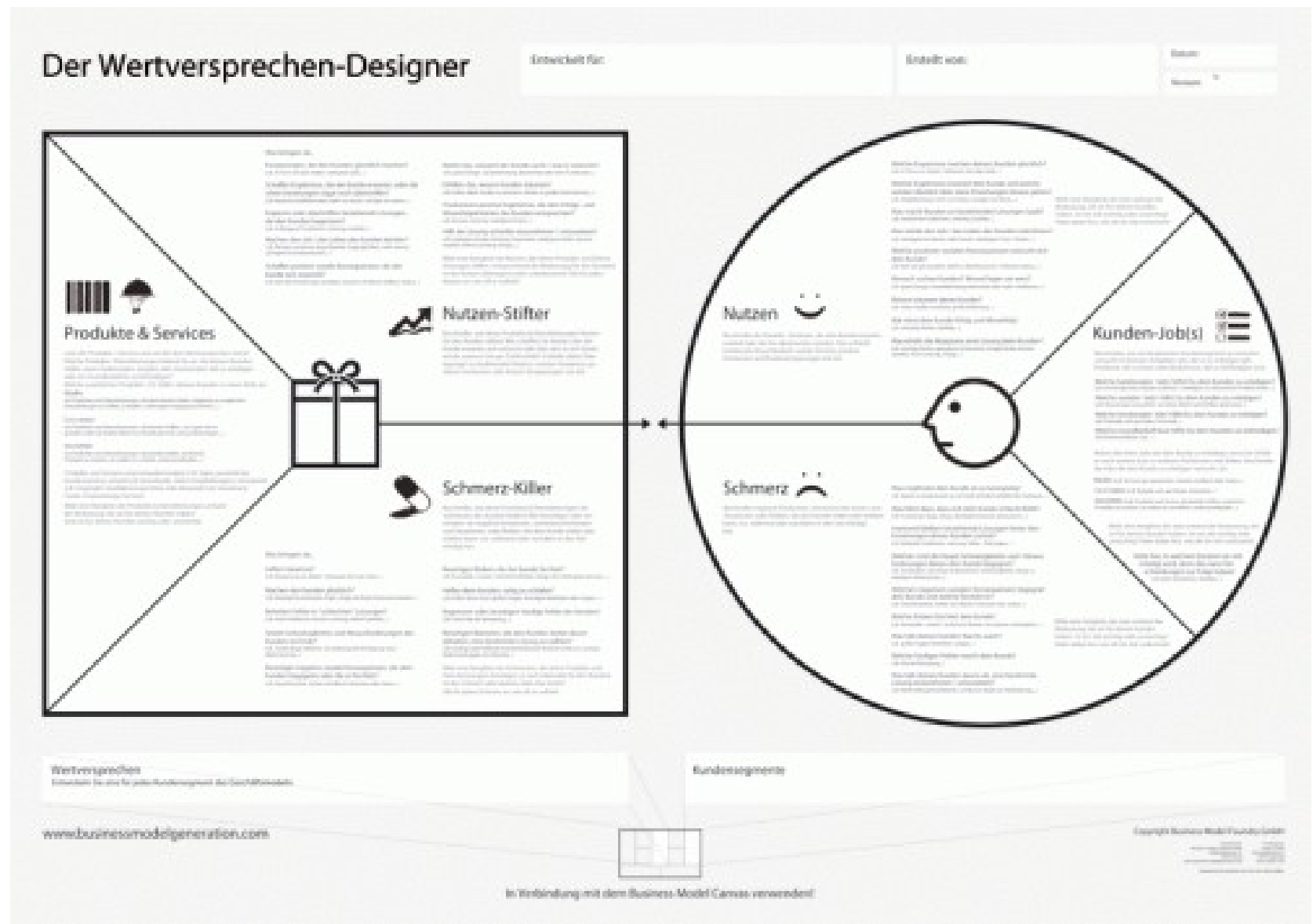
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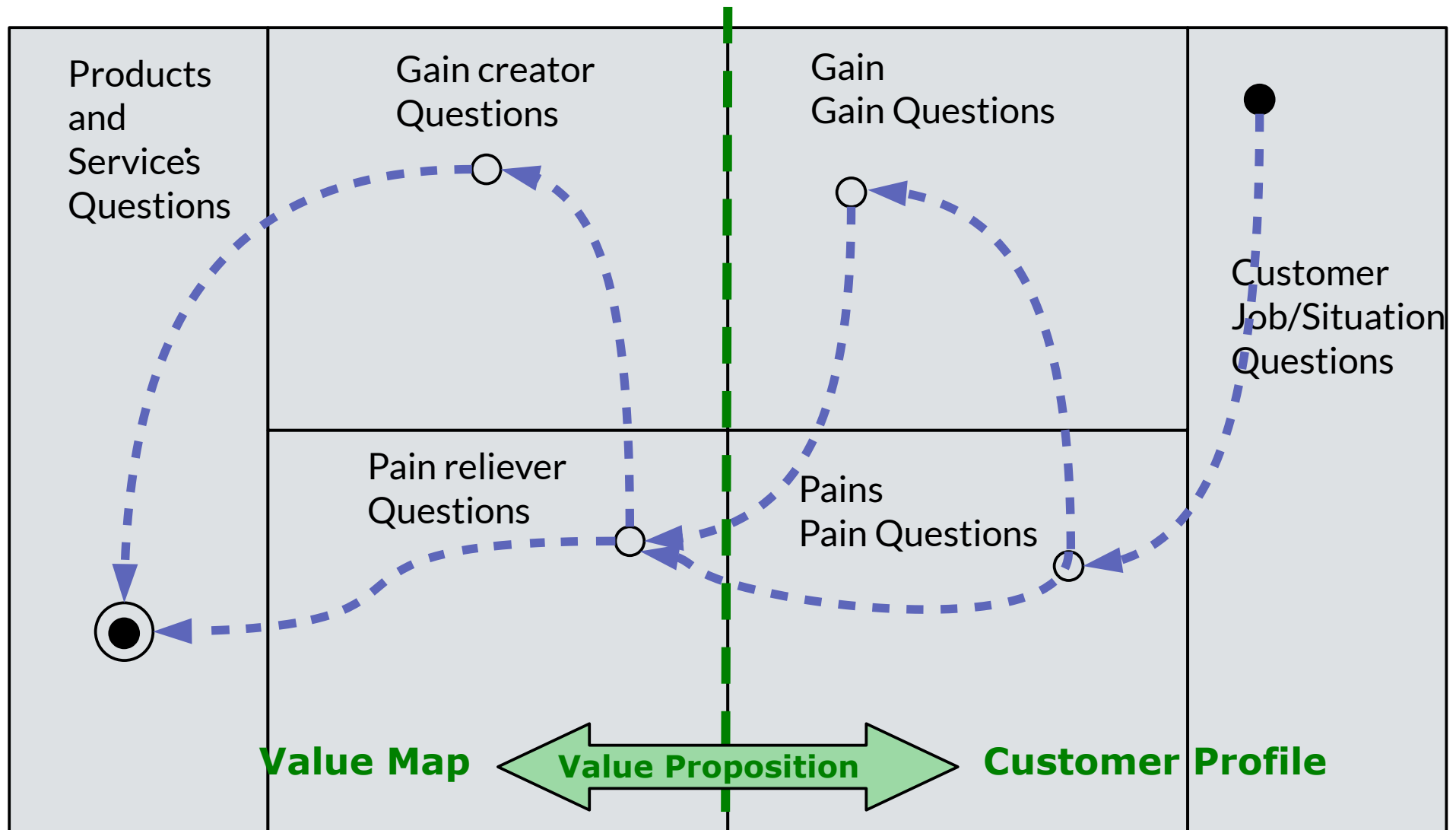
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Software as a Business, © Prof. Uwe Aßmann



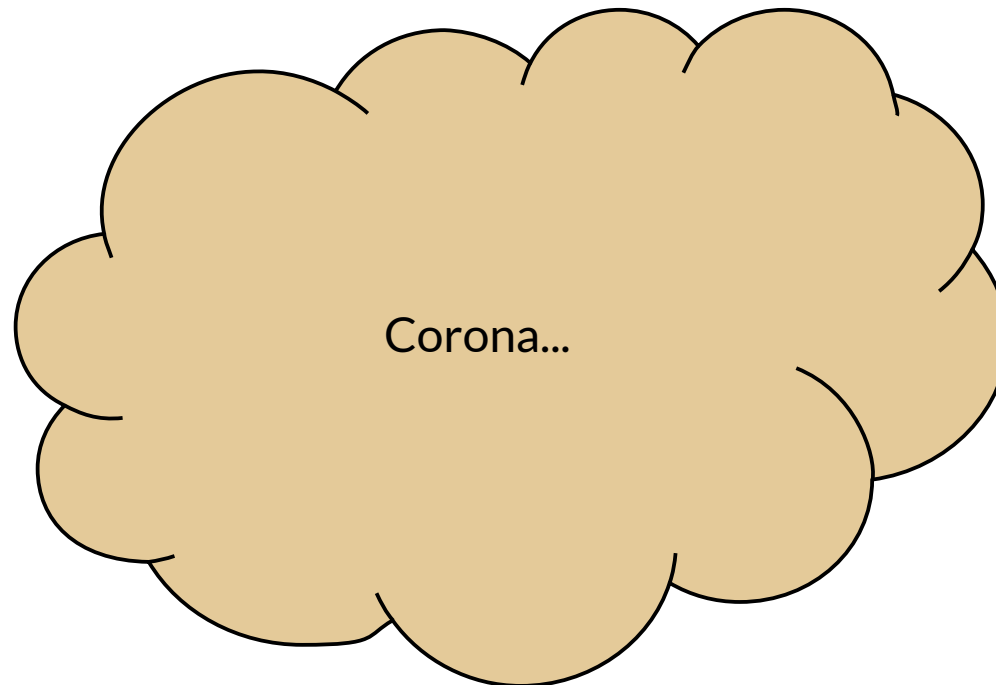
VP Canvas Process

- ▶ [Osterwalder-OPC] VPA uses a canvas to map the customer pains and gains to products and services
- ▶ The VPC defines the field “value proposition” of the BMC

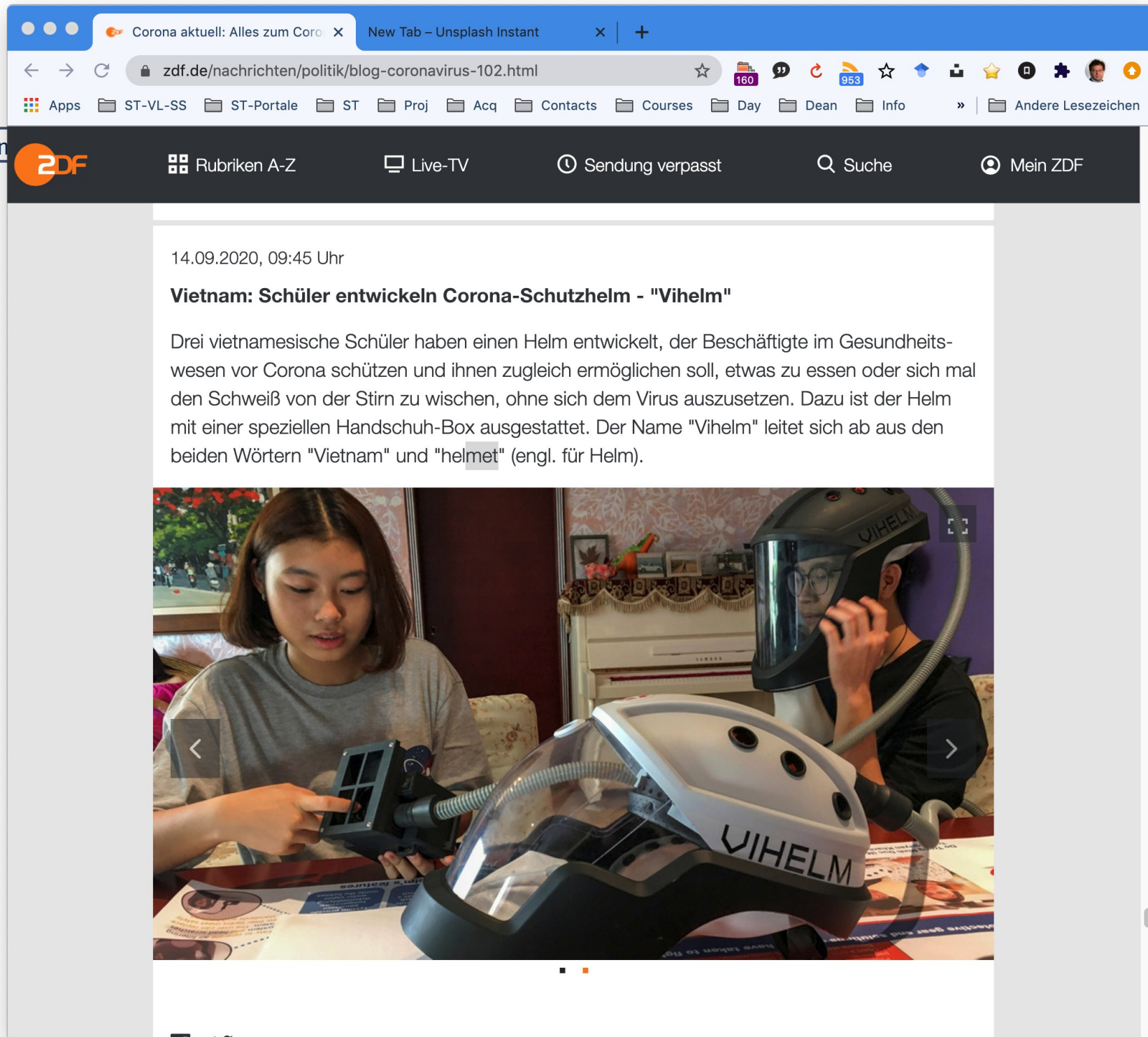


Problem / Pain Diary

- ▶ Def.: A **pain diary** is a diary in which all problems, pains, deficiencies of techniques and tools are recorded day by day
- ▶ <https://md.saab18.inf.tu-dresden.de/ProblemDiary>
- ▶ Problems are *pains* if they press the customer a lot



ZDF, 2020-09-15



The screenshot shows a web browser displaying a ZDF news article. The browser's address bar shows the URL [zdf.de/nachrichten/politik/blog-coronavirus-102.html](https://www.zdf.de/nachrichten/politik/blog-coronavirus-102.html). The ZDF logo is visible in the top left of the page. The article is dated 14.09.2020, 09:45 Uhr and is titled "Vietnam: Schüler entwickeln Corona-Schutzhelm - "Vihelm"". The text describes a helmet developed by three Vietnamese students to protect healthcare workers from COVID-19. The helmet, named "Vihelm", is equipped with a special glove box and allows users to wipe sweat from their forehead without being exposed to the virus. The name "Vihelm" is derived from the words "Vietnam" and "helmet". Below the text is a video player showing a woman working on the helmet's components and a man wearing the helmet. The helmet is black and white with a clear visor and the word "VIHELM" printed on it.

Corona aktuell: Alles zum Coro x New Tab – Unsplash Instant

zdf.de/nachrichten/politik/blog-coronavirus-102.html


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ZDF Rubriken A-Z Live-TV Sendung verpasst Suche Mein ZDF

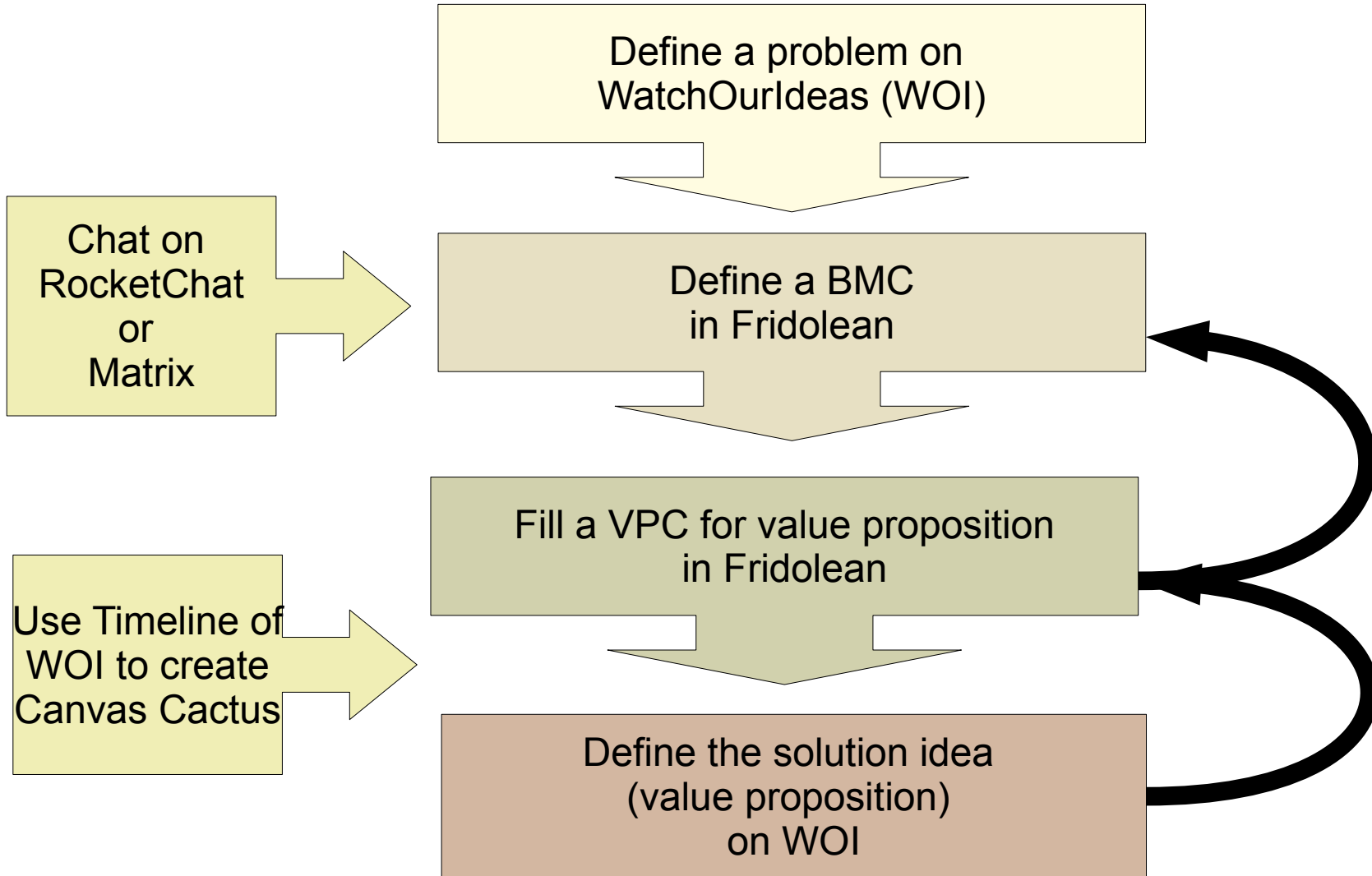
14.09.2020, 09:45 Uhr

Vietnam: Schüler entwickeln Corona-Schutzhelm - "Vihelm"

Drei vietnamesische Schüler haben einen Helm entwickelt, der Beschäftigte im Gesundheitswesen vor Corona schützen und ihnen zugleich ermöglichen soll, etwas zu essen oder sich mal den Schweiß von der Stirn zu wischen, ohne sich dem Virus auszusetzen. Dazu ist der Helm mit einer speziellen Handschuh-Box ausgestattet. Der Name "Vihelm" leitet sich ab aus den beiden Wörtern "Vietnam" und "helmet" (engl. für Helm).



BMC-VPC Innovation Workflow on LINC

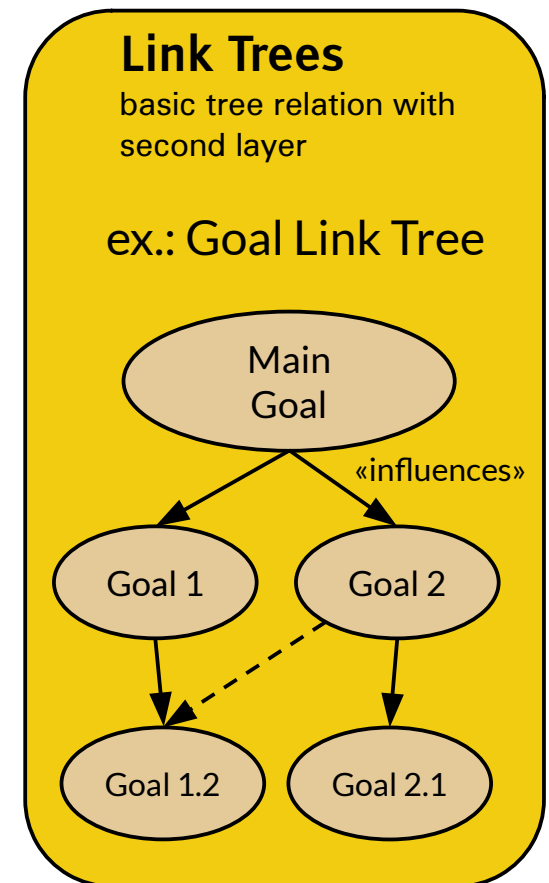
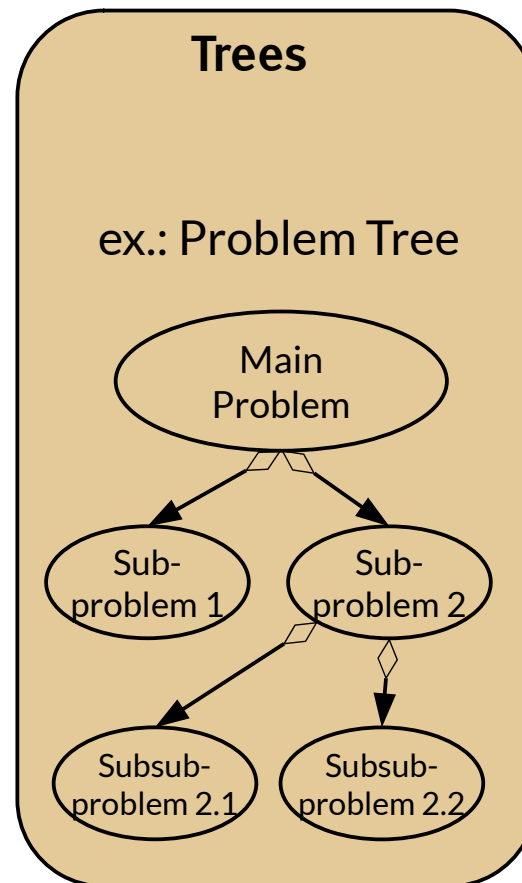
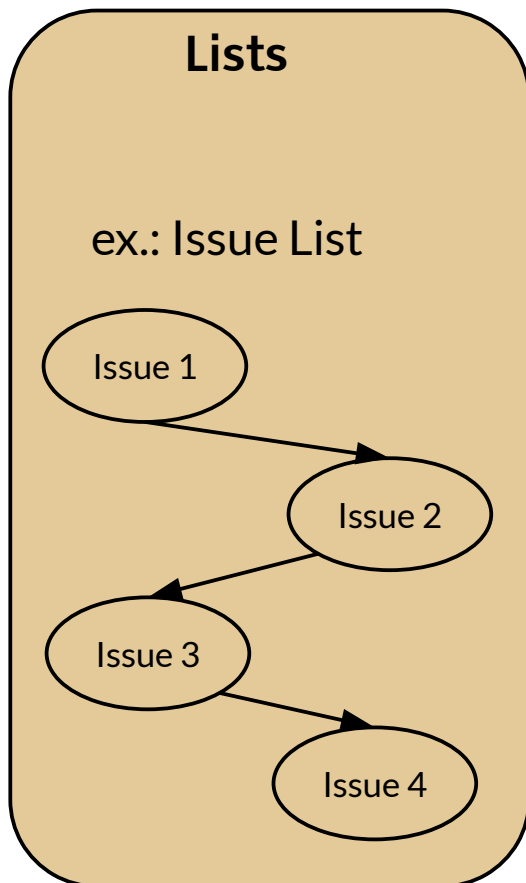


2.4.1. Excursion: Canvases are Link-Tree Models

- This is one of the basic topics of course „Softwaretechnologie II“

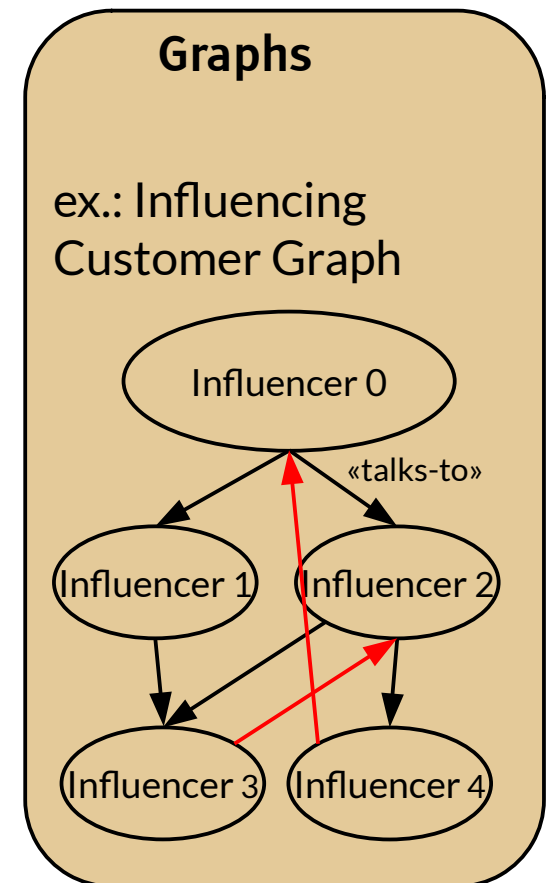
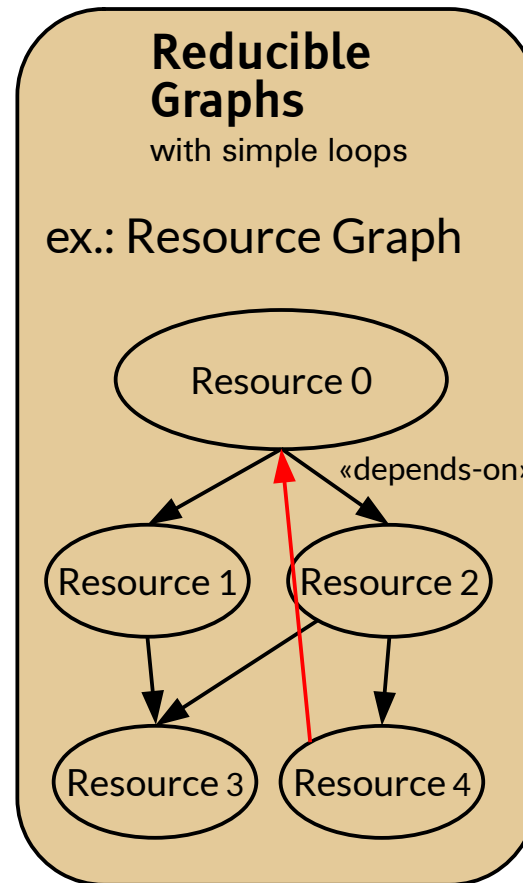
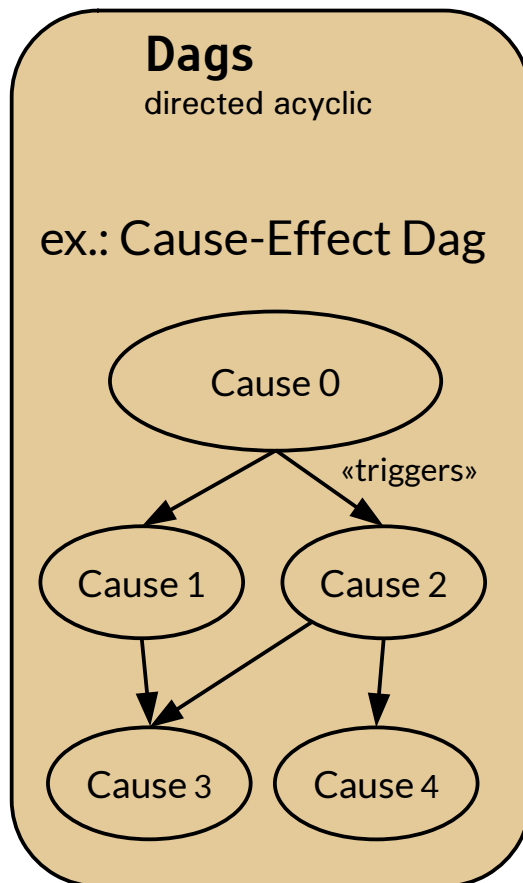
Other, Hierarchic Models

- ▶ For values, problems/pains, gains, customers, channels, resources etc. we need not only canvases but all kinds of *hierarchic (structured)* models:



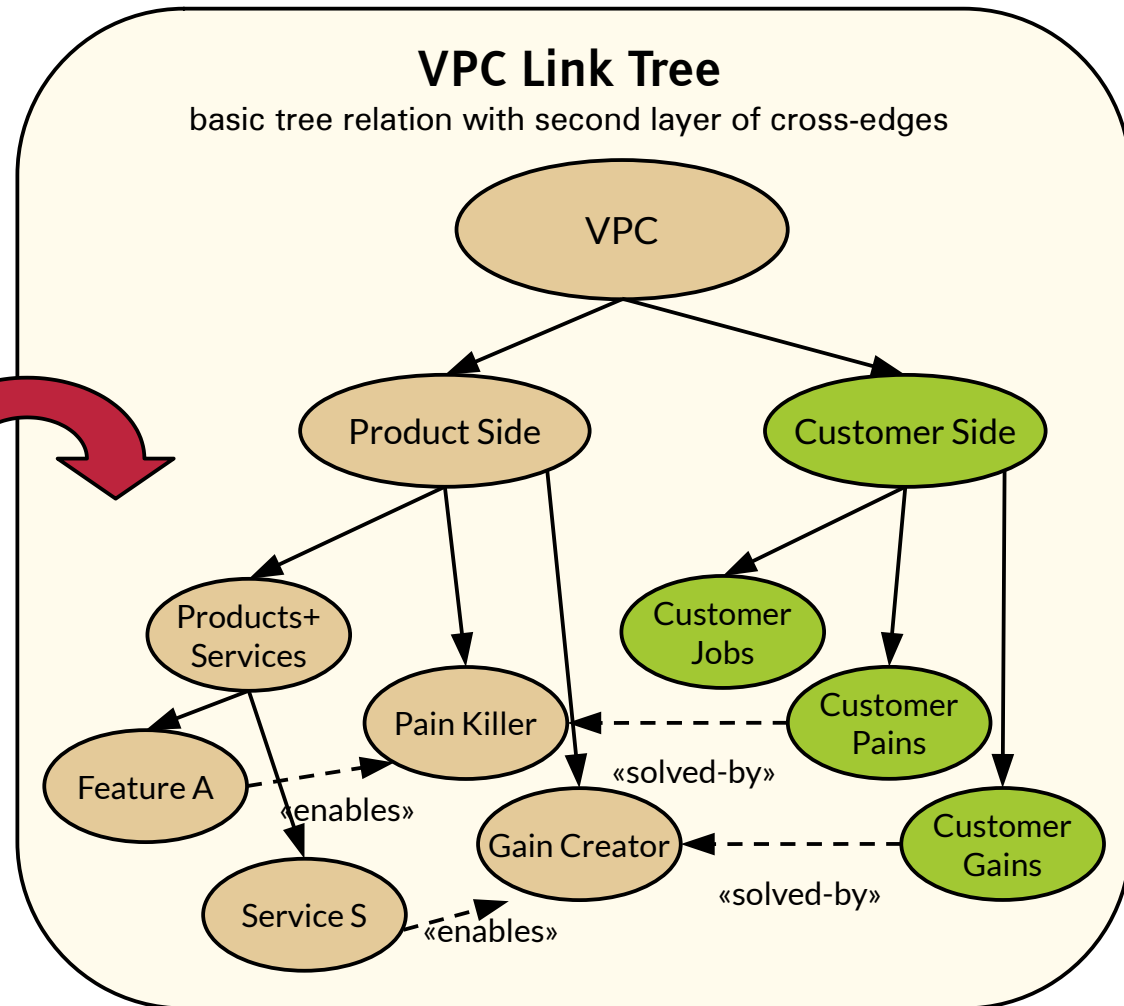
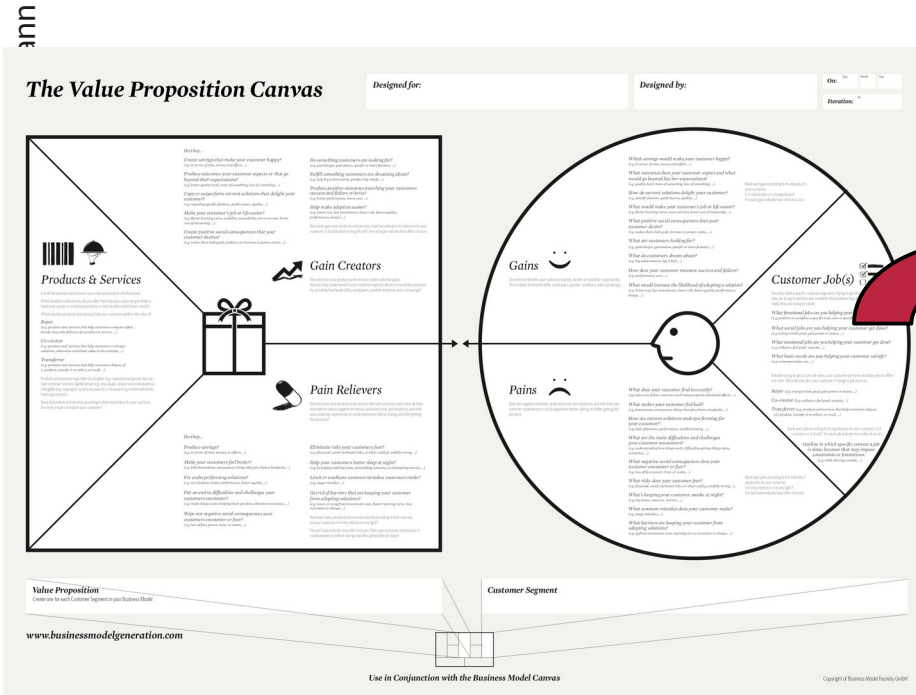
Graph-Like Models

- ▶ Trees and link trees are *simpler structures* than these here:



How to Turn the Canvas into a Link-Tree Model

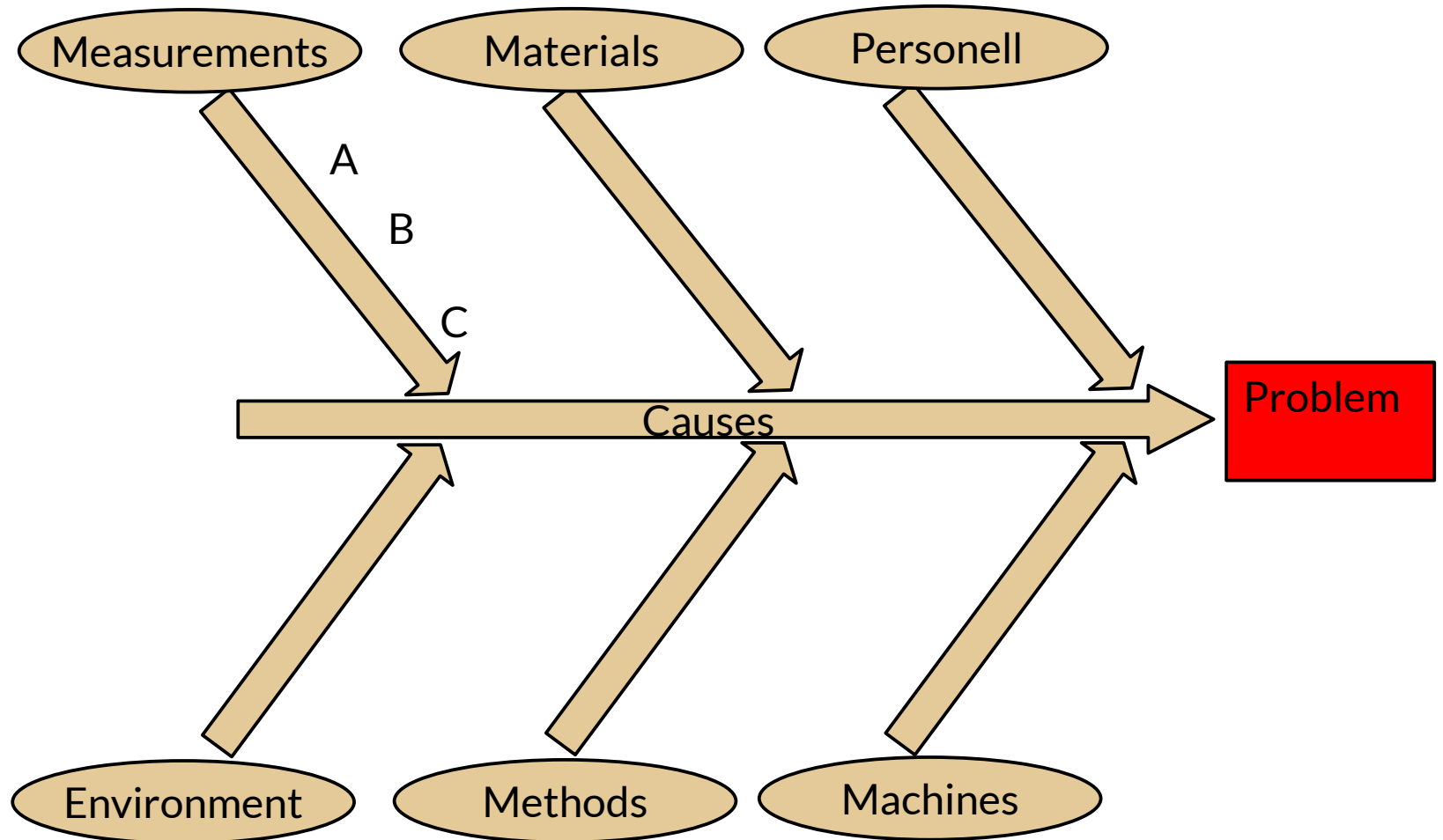
- ▶ Areas of the canvas turn into nodes of the model
- ▶ Cross-edges are created from the semantic dependencies of the canvas fields
- ▶ Q: can the link tree be a cyclic graph? What does a cycle mean?



Ishikawa Fishbone Canvas

Example with 6 Facets (Tree Model)

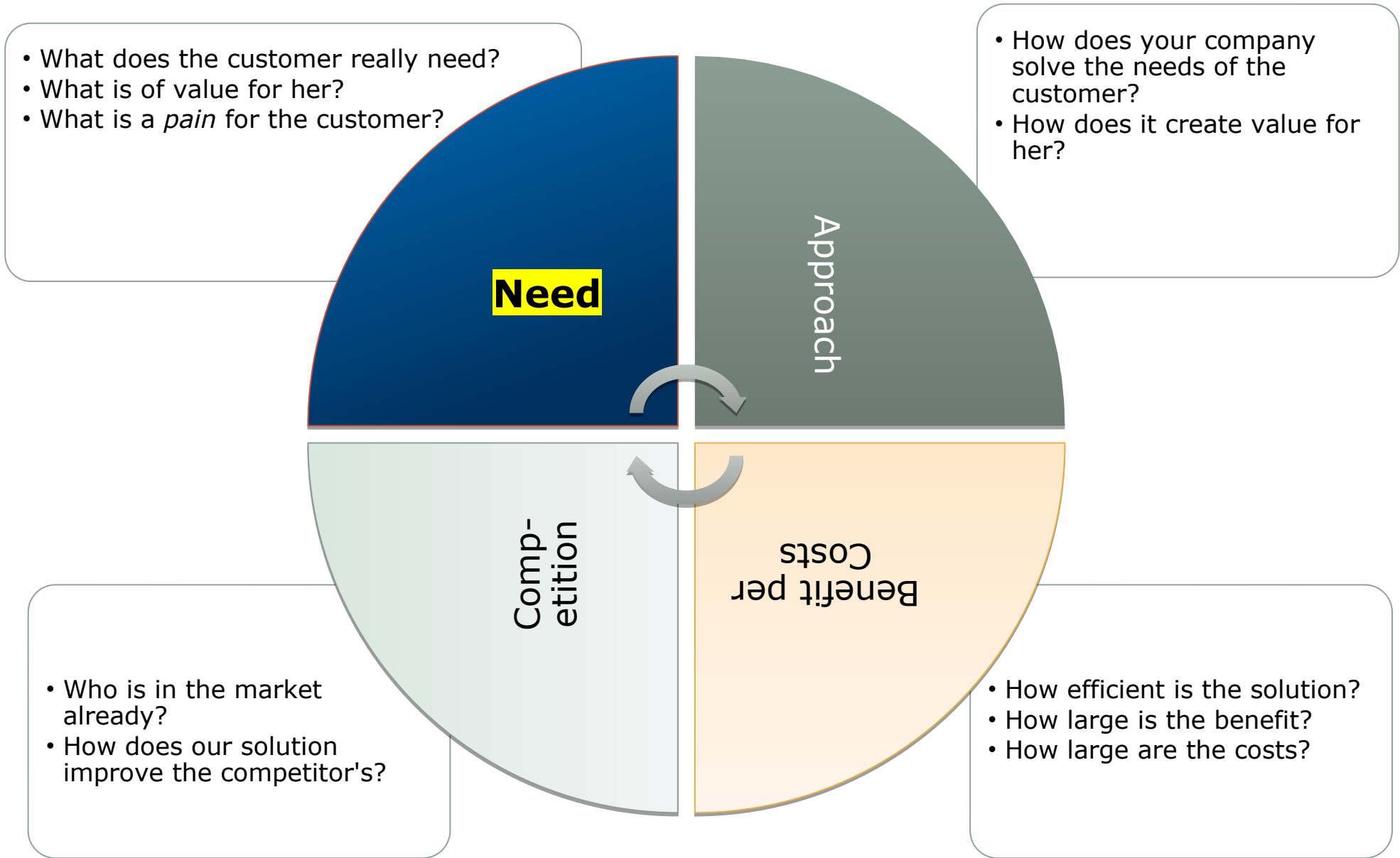
- ▶ Cause-Effect Tree of Reasons and caused problems
- ▶ For different domains, Business or Software Engineering, different facets can be used



2.4.2 Value Proposition Analysis with nABC

- NABC is a fantastic 4-step scheme for summarizing your idea for a new product or service.
- Learn it by heart, it will change your life.

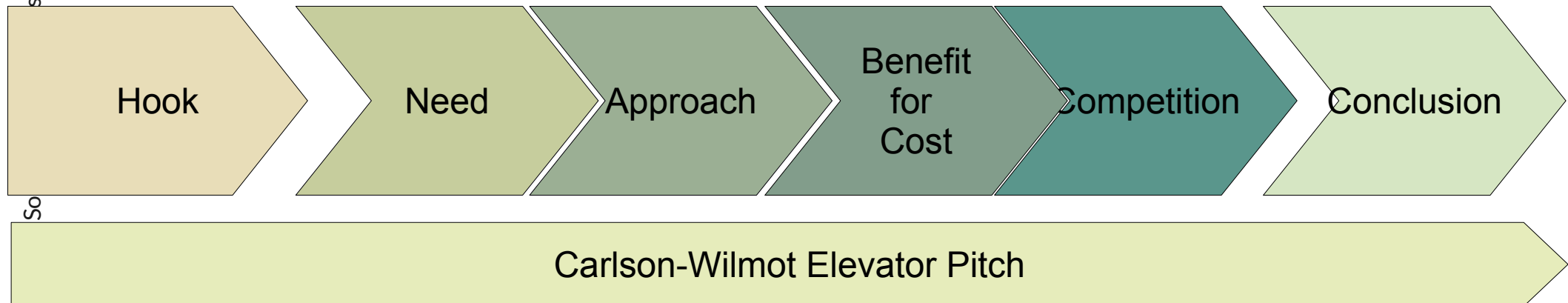
NABC Analysis [Carlson-Wilmot]



NABC Elevator Pitch

- ▶ An **elevator pitch** is a 2-minute speech about the value proposition (problem-solution analysis) of your PhD thesis project
 - You should be able to tell it an important investor in an elevator (2 min)
- ▶ It combines a problem solving pattern such as NABC with a hook, a gripping introductory remark
 - You may use any other pattern, too

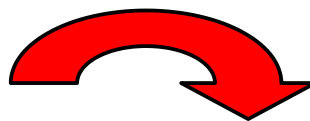
ss, © Prof. Uwe Aßmann



So


Exercise: Application

- ▶ For preparing your next application for a job,
- ▶ Analyze the future employer with NABC
 - What are his needs?
 - What is your approach?
 - What is his benefits?
 - Who are your competitors?
- ▶ Learn the answers for these questions by heart, to be able to present them in the interview!
- ▶ Advanced: Turn your NABC pitch into a link-tree model. What is the primary relation, what is the secondary links?




Story Telling Canvas /(Strategyzer)

- ▶ You can pack the NABC also into a Story, telling N, A, B, and C.

STORYTELLING CANVAS 

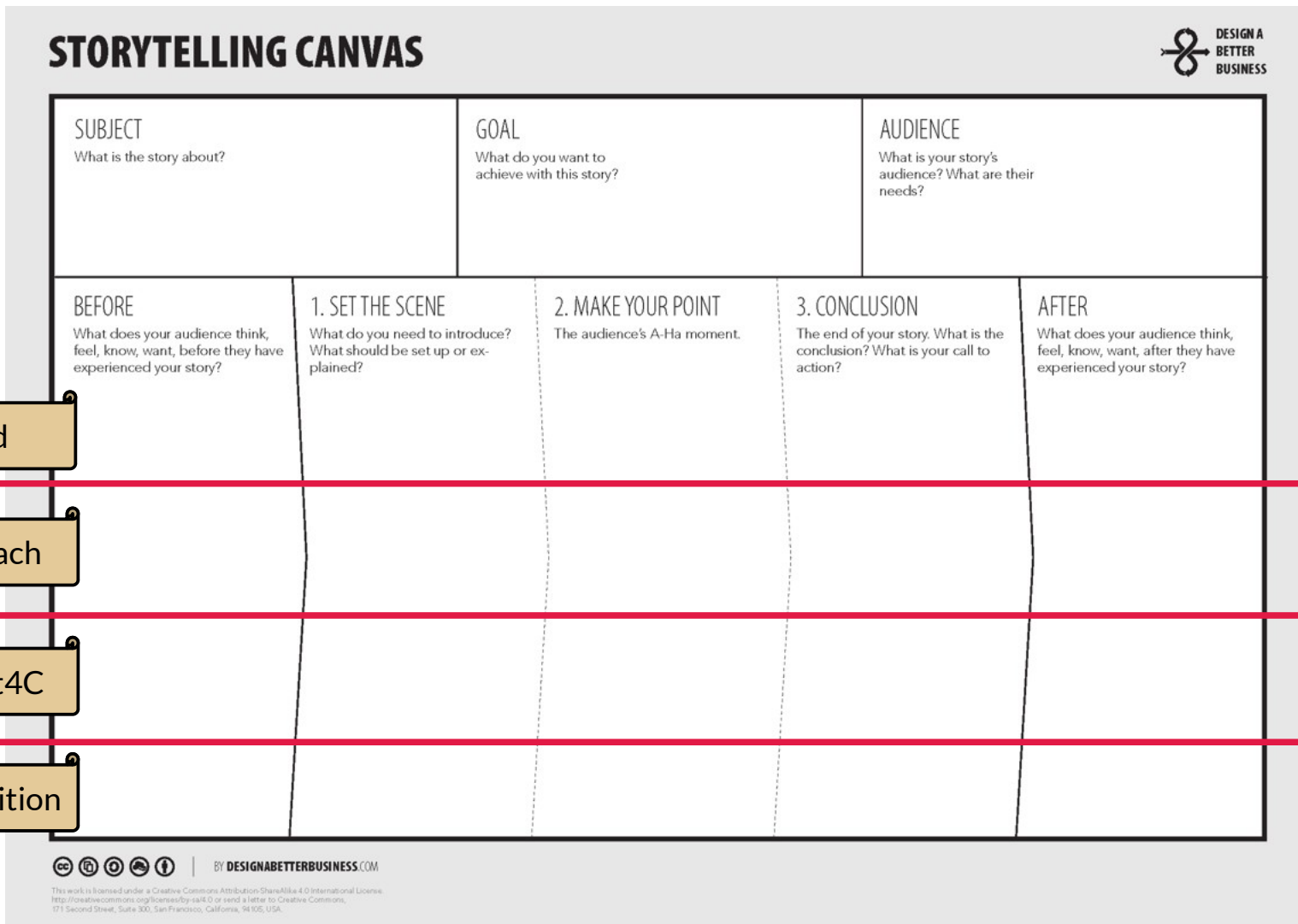
SUBJECT What is the story about?		GOAL What do you want to achieve with this story?		AUDIENCE What is your story's audience? What are their needs?	
BEFORE What does your audience think, feel, know, want, before they have experienced your story?	1. SET THE SCENE What do you need to introduce? What should be set up or explained?	2. MAKE YOUR POINT The audience's A-Ha moment.	3. CONCLUSION The end of your story. What is the conclusion? What is your call to action?	AFTER What does your audience think, feel, know, want, after they have experienced your story?	

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Story Telling Canvas /(Strategyzer)

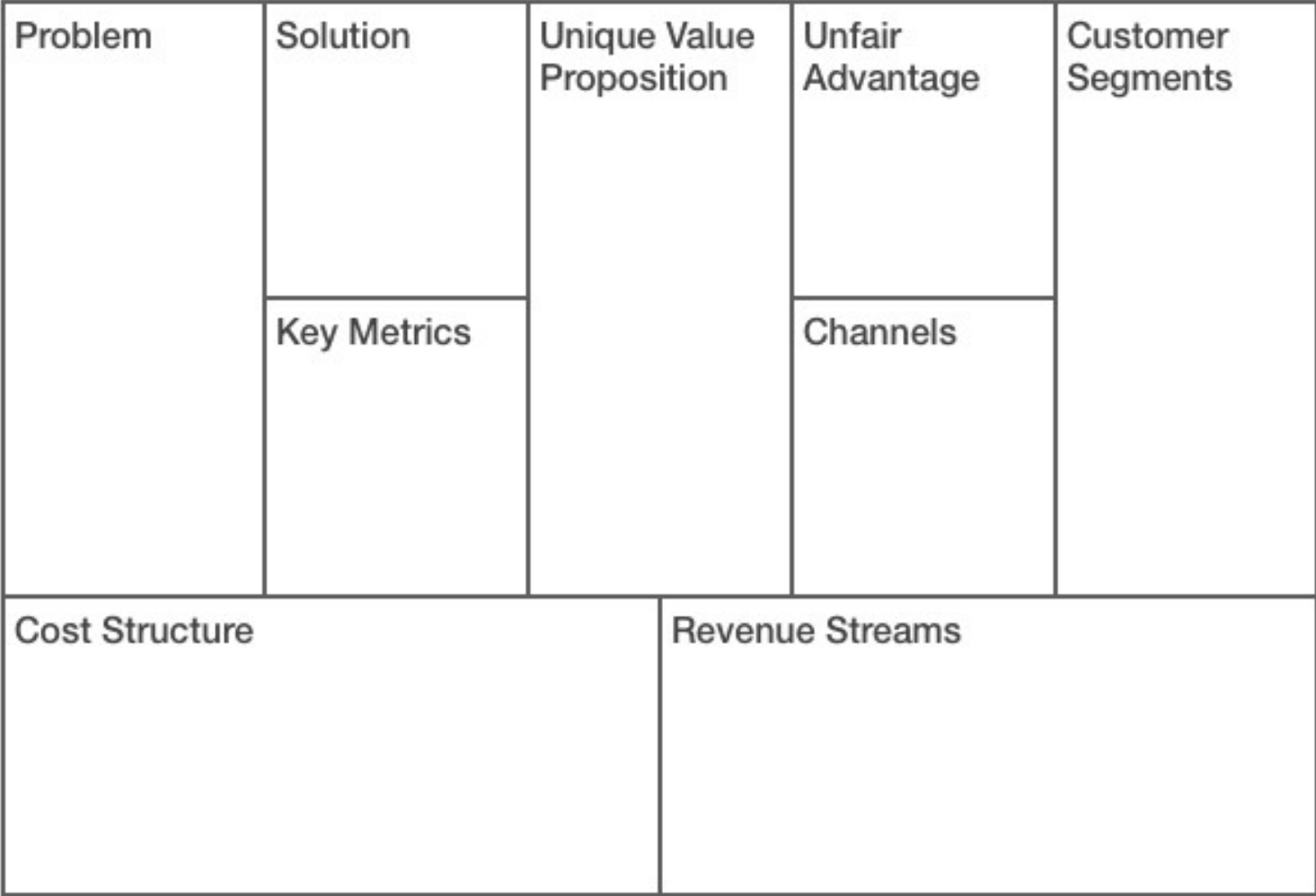
- ▶ You can pack the NABC also into a Story, telling N, A, B, and C.



2.5 Lean Canvas

- Bridging problems, solutions, and customers
- An important variant of the BMC for problem-solution analysis of customers
- Combining BMC and VPC













Lean Canvas [Maurya]



Lean Canvas is adapted from The Business Model Canvas (<http://www.businessmodelgeneration.com>) and is licensed under the Creative Commons Attribution-Share Alike 3.0 Un-ported License.



Lean Canvas [Neos Chronos Version]

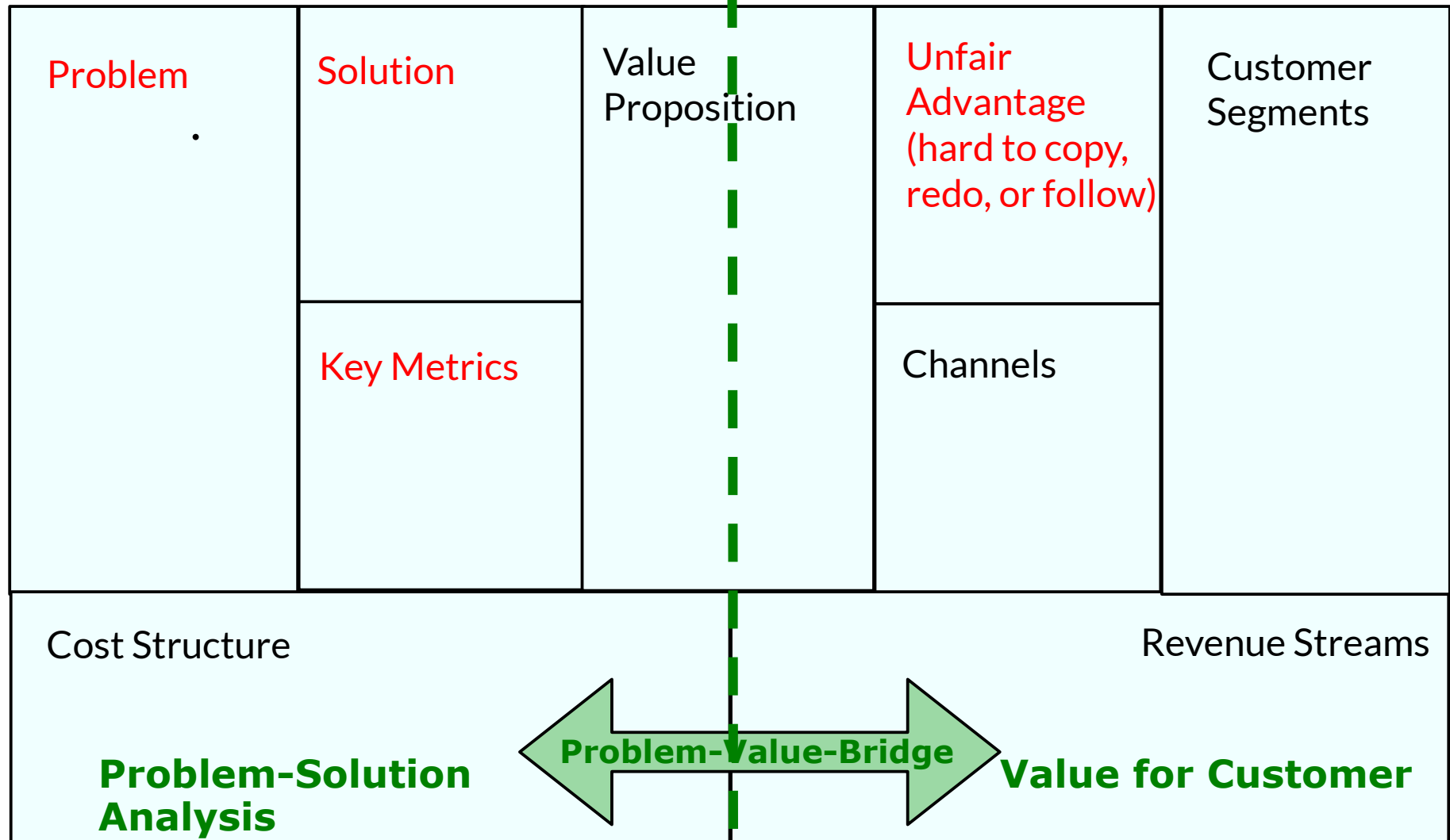
The Lean Canvas		Designed for:	Designed by:	Date:	Version:
		Startup Name	Name1, Name2, ...	DD/MM/YYYY	X.Y
Problem  Top 3 problems	Solution  Top 3 features	Unique Value Prop.  Single, clear and compelling message that states why you are different and worth buying	Unfair Advantage  Can't be easily copied or bought	Customer Segments  Target Customers	
Existing Alternatives  List how these problems are solved today.	Key Metrics  Key activities you measure	High-Level Concept  List your X for Y analogy (e.g. YouTube = Flickr for videos)	Channels  Path to customers	Early Adopters  List the characteristics of your ideal customers.	
Cost Structure  List your fixed and variable costs. Customer acquisition costs Distribution costs Hosting People Etc.			Revenue Streams  List your sources of revenue. Revenue Model Life Time Value Revenue Gross Margin		

Lean Canvas is adapted from The Business Model Canvas (www.businessmodelgeneration.com/canvas). PowerPoint implementation by: Neos Chronos Limited (<http://neoschronos.com>). License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

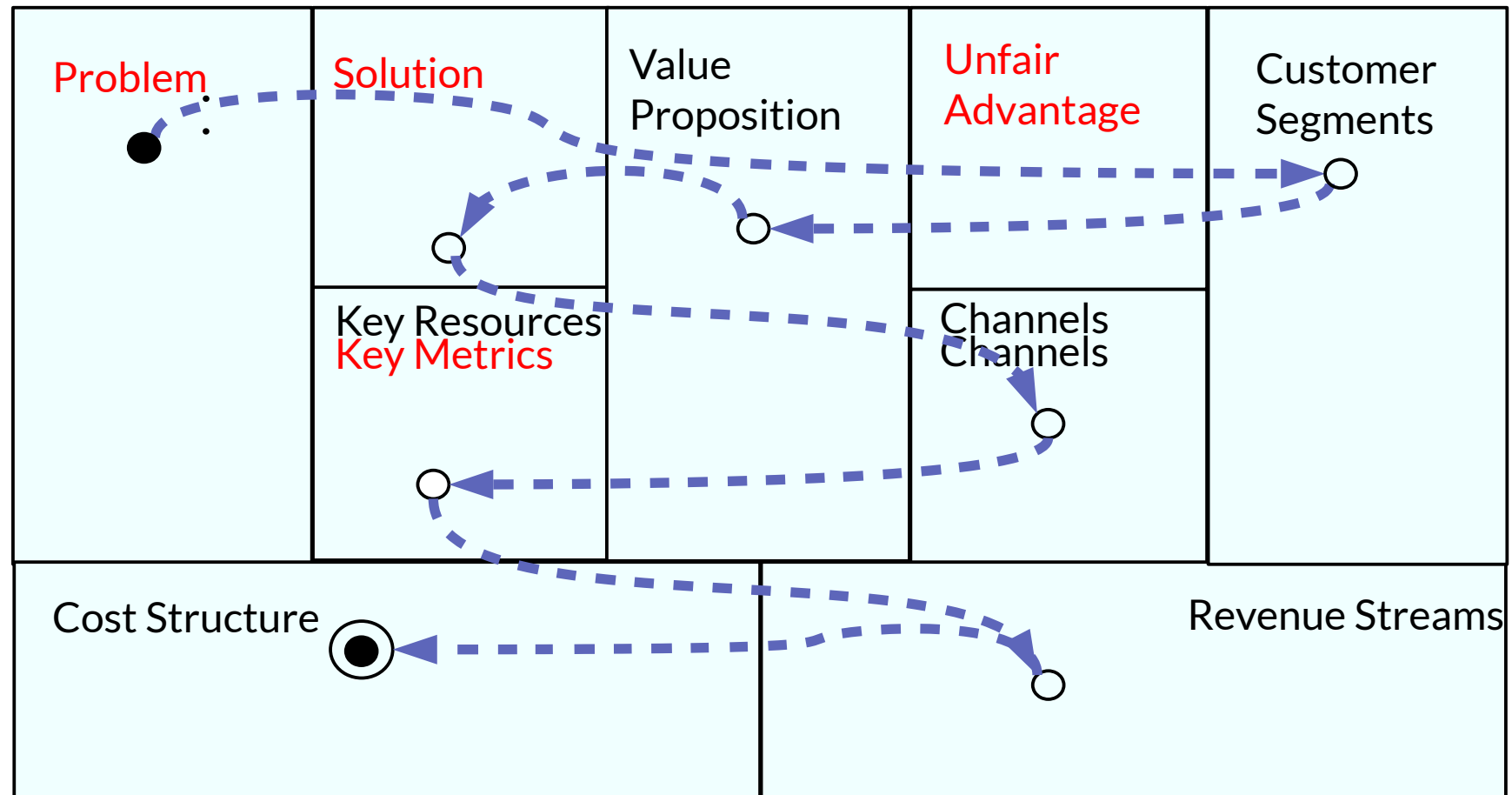


Lean Canvas [Maurya] [<http://leancanvas.com/>]

- ▶ The Lean Canvas substitutes the Cost Subcanvas by the Problem-Solution-Key-Metrics Subcanvas
- ▶ The Lean Canvas supports Problem-Objective-Solution-analysis (POA)

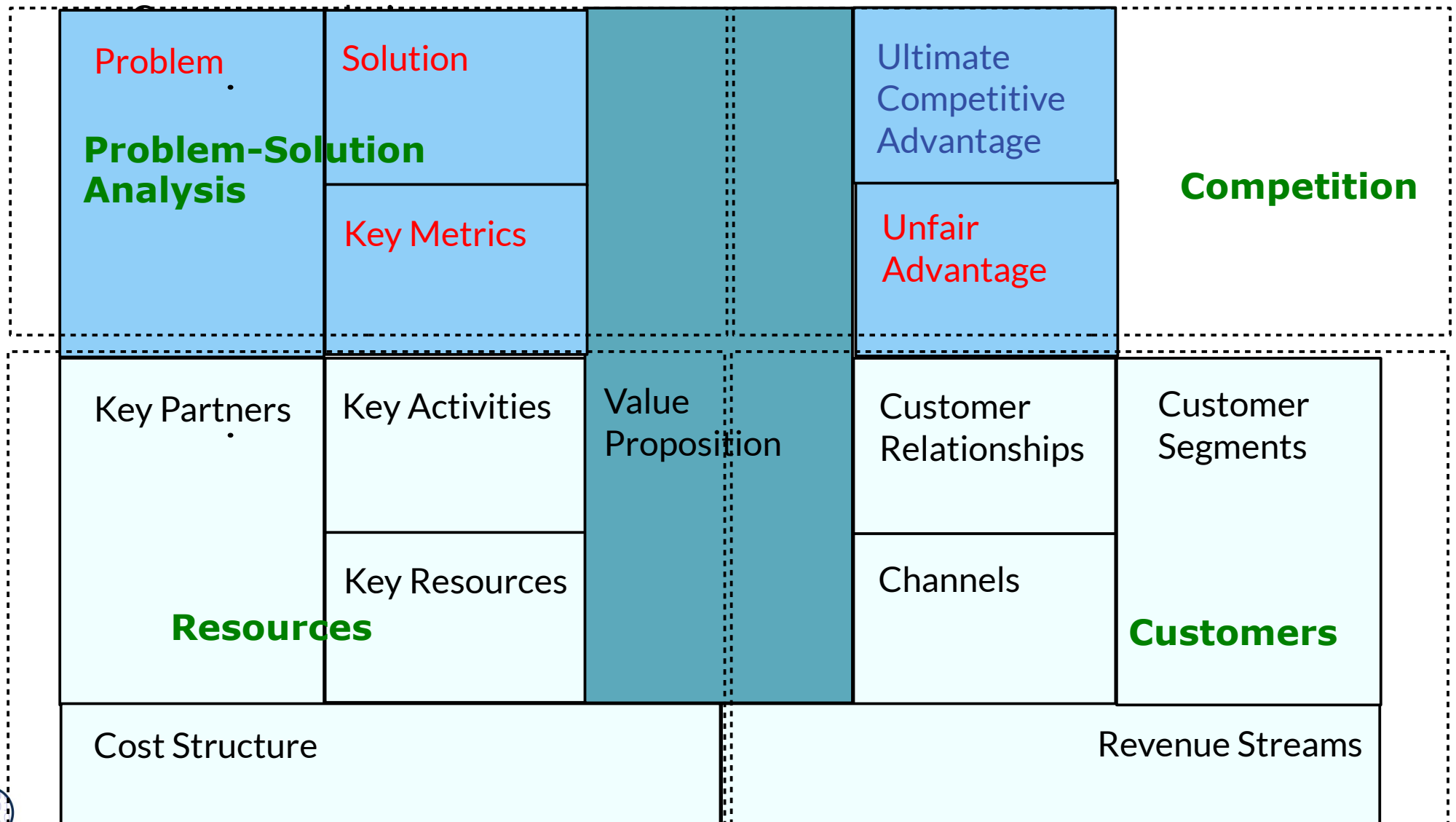


- ▶ The Lean Canvas substitutes the Cost Subcanvas by the Problem-Solution-Key-Metrics Subcanvas
- ▶ The Lean Canvas supports Problem-Objective-Solution-analysis (POA)
- ▶ The fill order is top-down outside-in

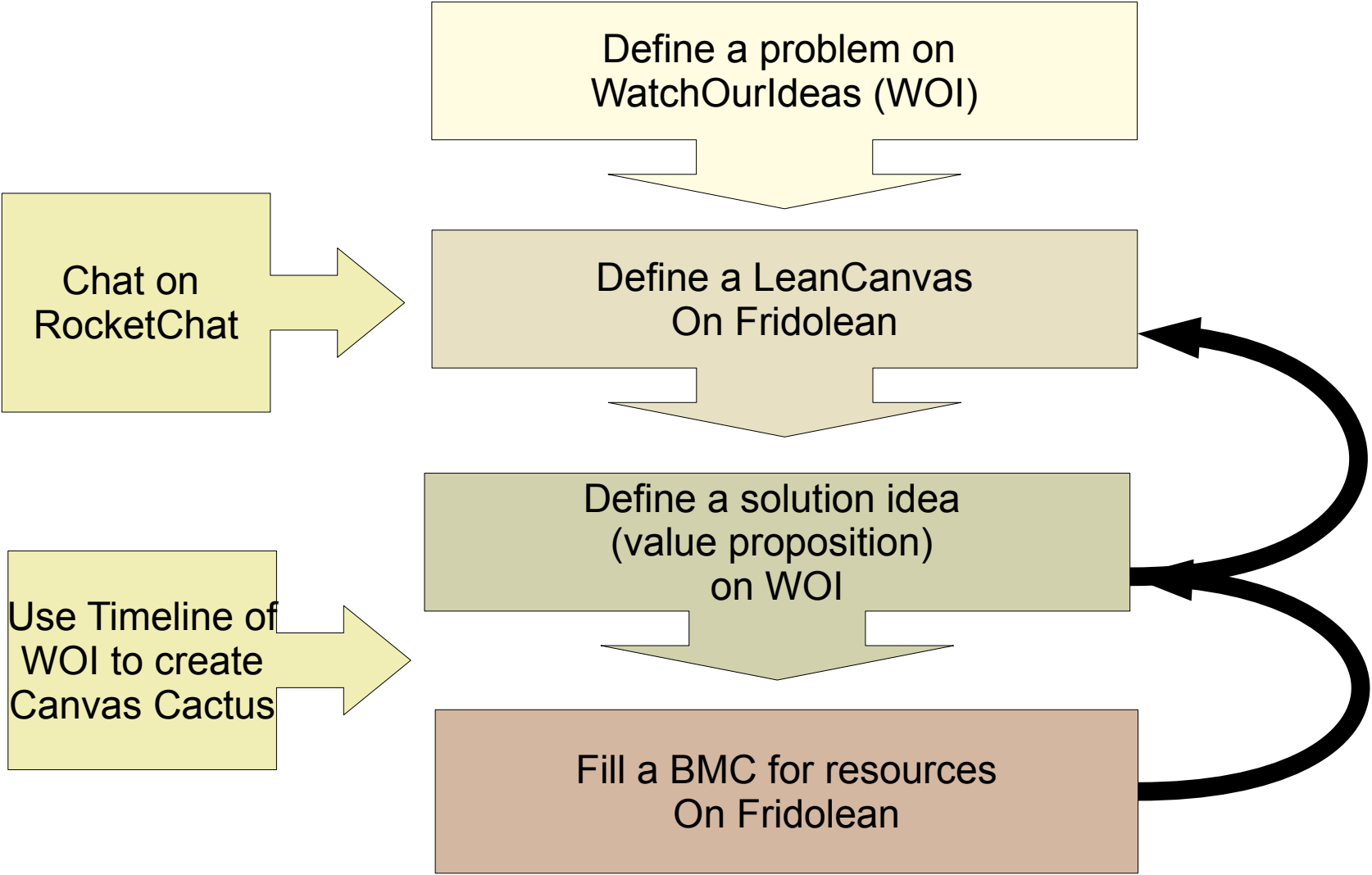


Lean Canvas Combined with BMC (Lean Business Model Canvas, LBMC)

- ▶ The Lean Canvas and the BMC can be unified by adding the subcanvases
- ▶ The LBMC supports Problem-Objective-Solution-analysis (POA), Competition analysis,



Lean Canvas Innovation Workflow on LINC














2.6 Other Canvases

Business Model You Canvas (BMYC)

- ▶ The BMYC is a canvas for your personal life and career development, inspired by the BMC. <http://businessmodelyou.com/>
 - http://www.ideogram.us/BMY_preview/Business_Model_You_preview.pdf
 - <https://leancchange.org/resources/canvases/>
- ▶ It can also be used for customer analysis

Name: _____ 's *Personal Business Model Canvas*

Who helps you (Key Partners) 	What you do (Key Activities) 	How you help (Value Provided) 	How you interact (Customer Relationships) 	Who you help (Customers) 
	Who you are & what you have (Key Resources) 		How they know you & how you deliver (Channels) 	
What you give (Costs) 		What you get (Revenue and Benefits) 		

Personal Value Proposition with the Personal BMC (BMYC)

[<http://businessmodelyou.com/>]

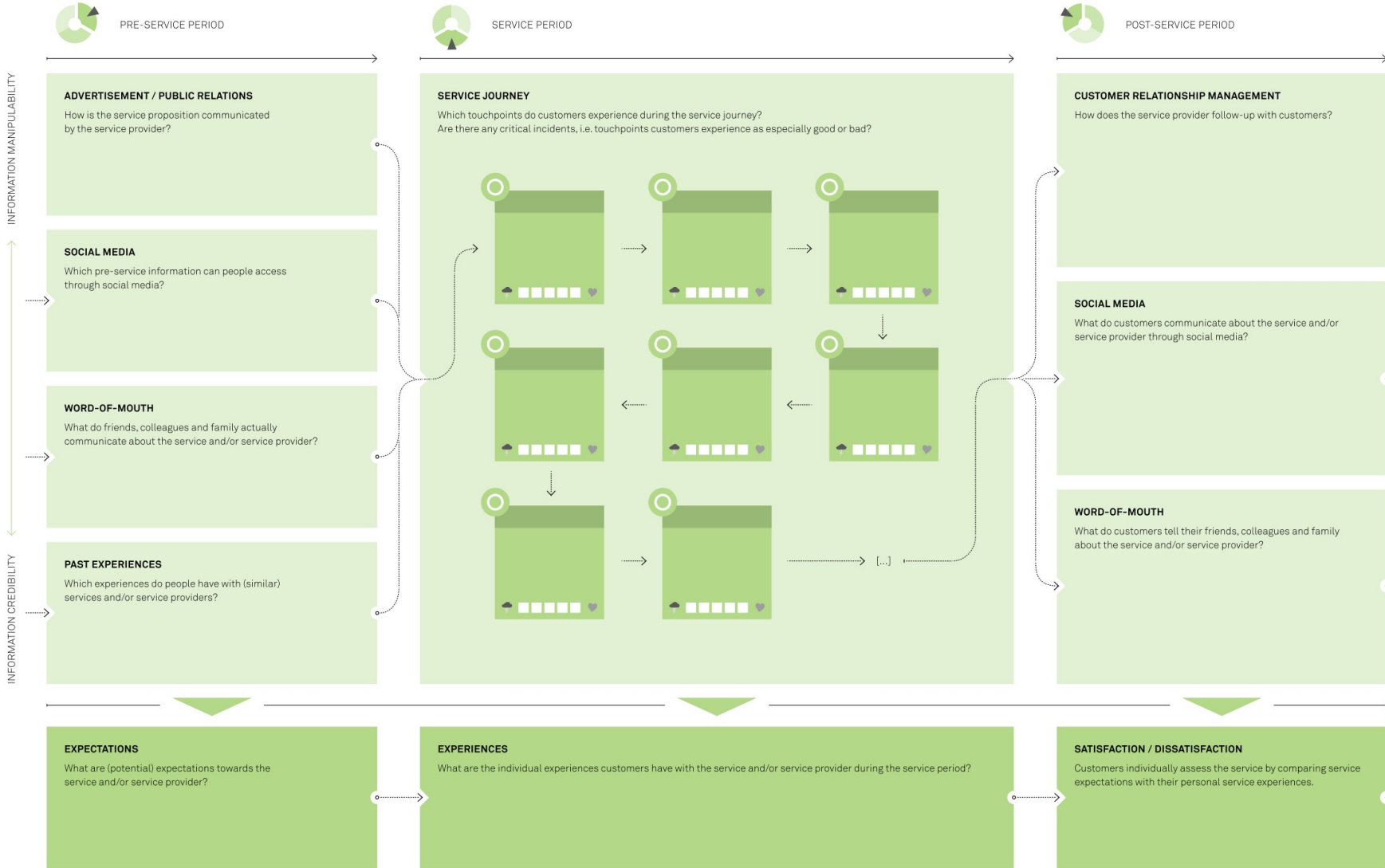
- ▶ The BMYC is for the development of your career and yourself, also for customer analysis

Key Partners Who helps You?	Key activities What do you do?	Value Proposition How do you help?	Customer Relationships How do you interact?	Customer Segments Whom do you help?
	Key Resources What you are and have		Channels How do they know you? How do you deliver?	
Cost Structure What do you give?			Revenue Streams What do you get?	

Customer Journey Canvas for Services

The Customer Journey Canvas

Persona Service Service Provider Design Team

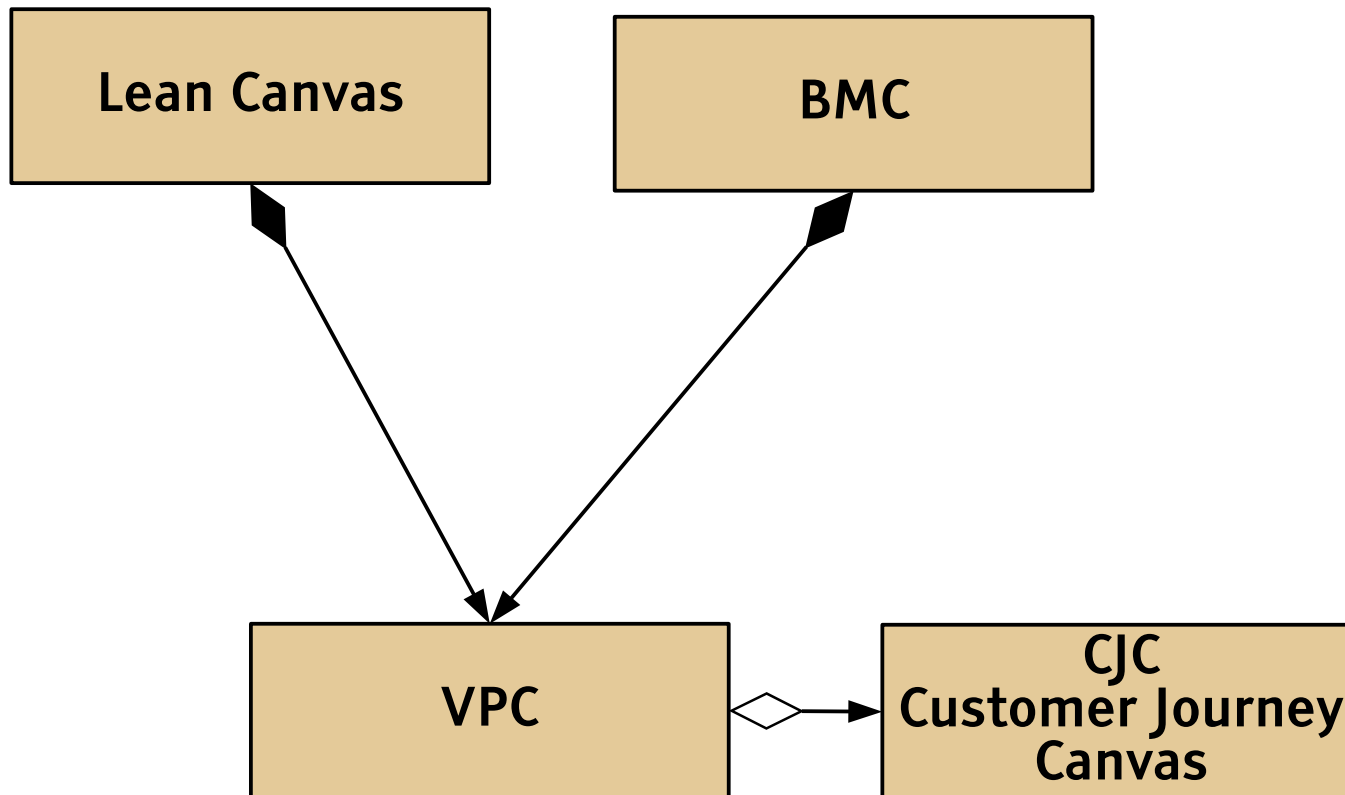


Customer Journey Canvas for Services (CJC)

- ▶ Service design is very important for young companies (→ chapter “Business models”)
 - A lightweight way to create business and customer relations
- ▶ CJC allows for brainstorming about all **customer touchpoints**, contact points with the customer during the service
 - <http://thisisservicedesignthinking.com/>
- ▶ <http://www.servicedesigntools.org/tools/8>
- ▶ On this website, you may edit several canvases, also the CJCS
 - <https://canvanizer.com/choose-canvas>

The Dependency Structure of Canvases

- ▶ Some canvases are subcanvases of others.
- ▶ Here is a little metamodel excerpt
- ▶ How would you maintain a cactus for all these canvases?



2.7 Other Innovation Processes

- An *innovation process* is a systematic way to generate innovations in a company or in a startup
- There are other innovation processes than Lean Startup

Innovation Process acc. to [Scholtissek]

- ▶ **Idea generation** with idea generation techniques
 - Idea management mit Idea Management Systems (IMS)
 - Idea labs and workshops
 - House-of-Quality – Idea matrix crossing requirements and ideas
- ▶ **Innovation planning**
 - Marketing concept
 - Market analysis
 - Idea Detailed Analysis with Questions acc. to Scholtissek
- ▶ **Prototyping** (realizability)
- ▶ **Piloting**
 - Market research about customer acceptance
 - Test phase
- ▶ **Commercialization**
 - Introduction to market

BMC
VPC

BMC
VPC

VPC

VPC

Idea
Generation

Innovation
planning

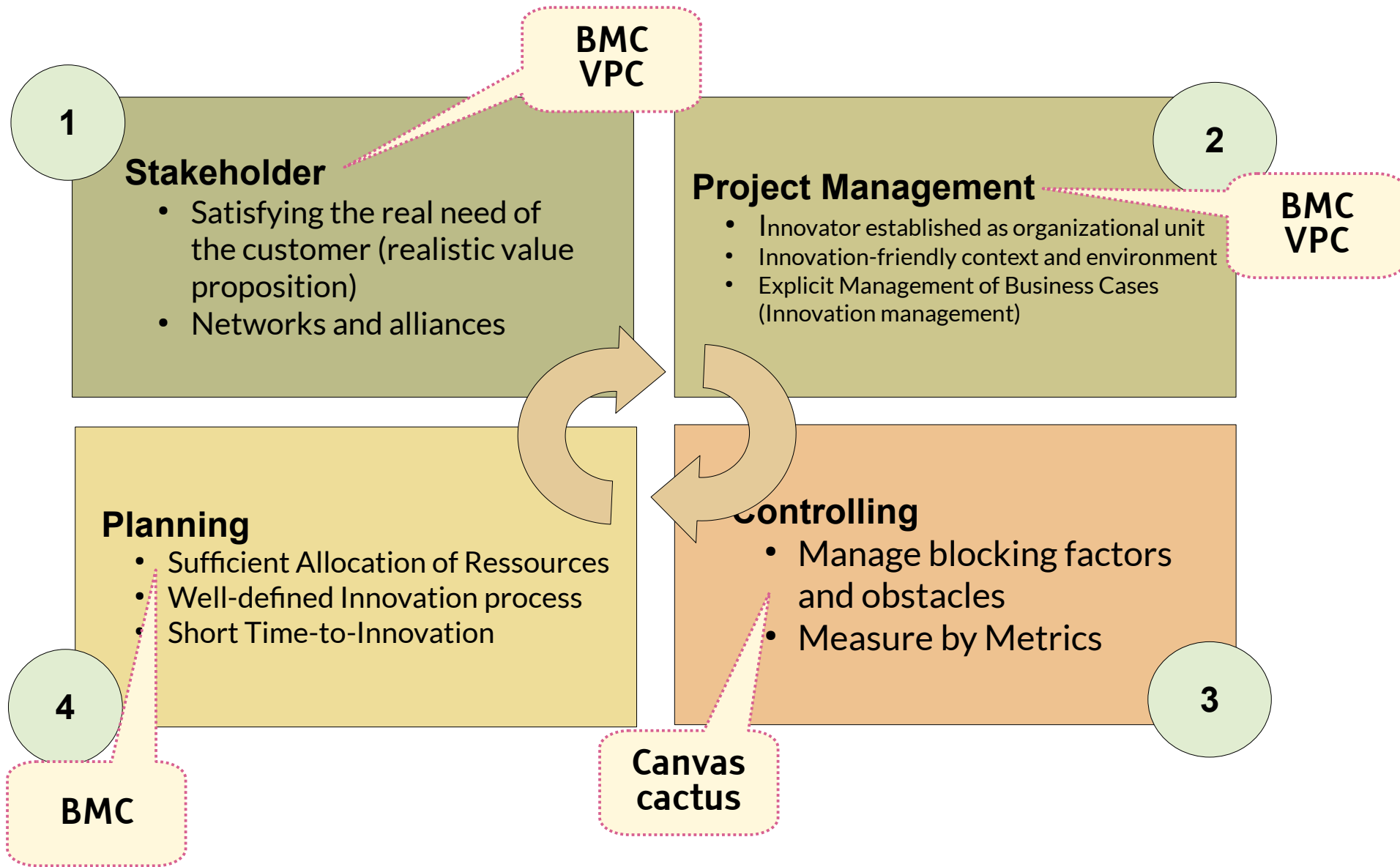
Prototyping

Piloting

Commerci-
alization

Scale

Success Factors of Innovation Processes acc. to [Scholtissek]



Statistical Innovation Process Metrics (-KPI) acc. To [Scholtissek]

Acc. To Scholtissek, every innovation process needs:

- ▶ **Metrics for Idea Generation**

- Number of Innovation Ideas of employees
- Number of filled or matured canvases
- Number of ideas per process step

- ▶ **Metrics for efficiency of innovation** (utility, investments vs cost per innovation)

- Turnaround of the new products in the last years
- Rise in market share due to the new products
- Cost reduction by process innovation
- Cost for research and development in relation to turnaround

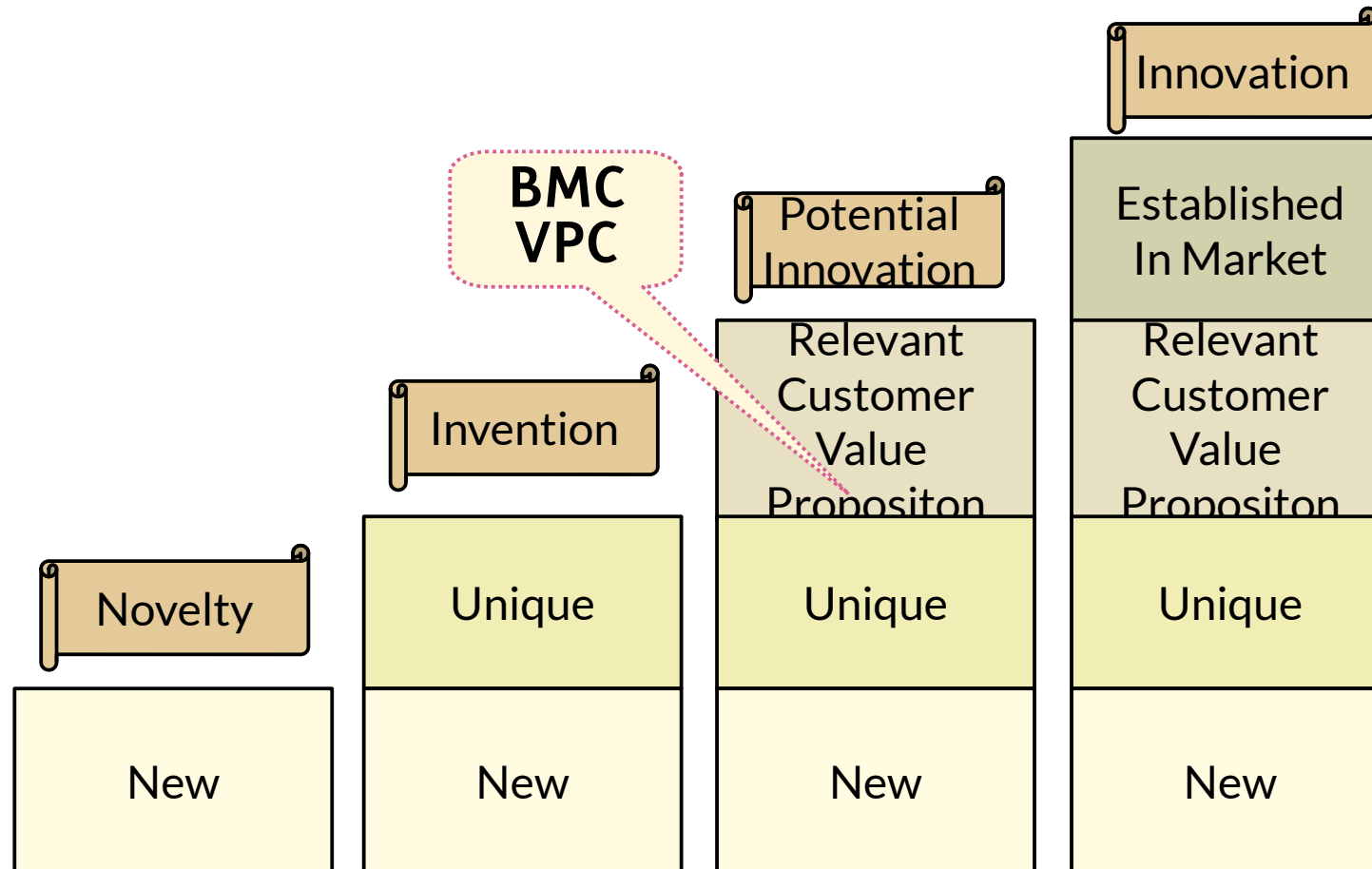
- ▶ **Time of Innovation Process (Time-to-Innovation)**

- ▶ **Different innovation types**

- Product, process, business model innovation, etc.
- Evolutionary, revolutionary, disruptive

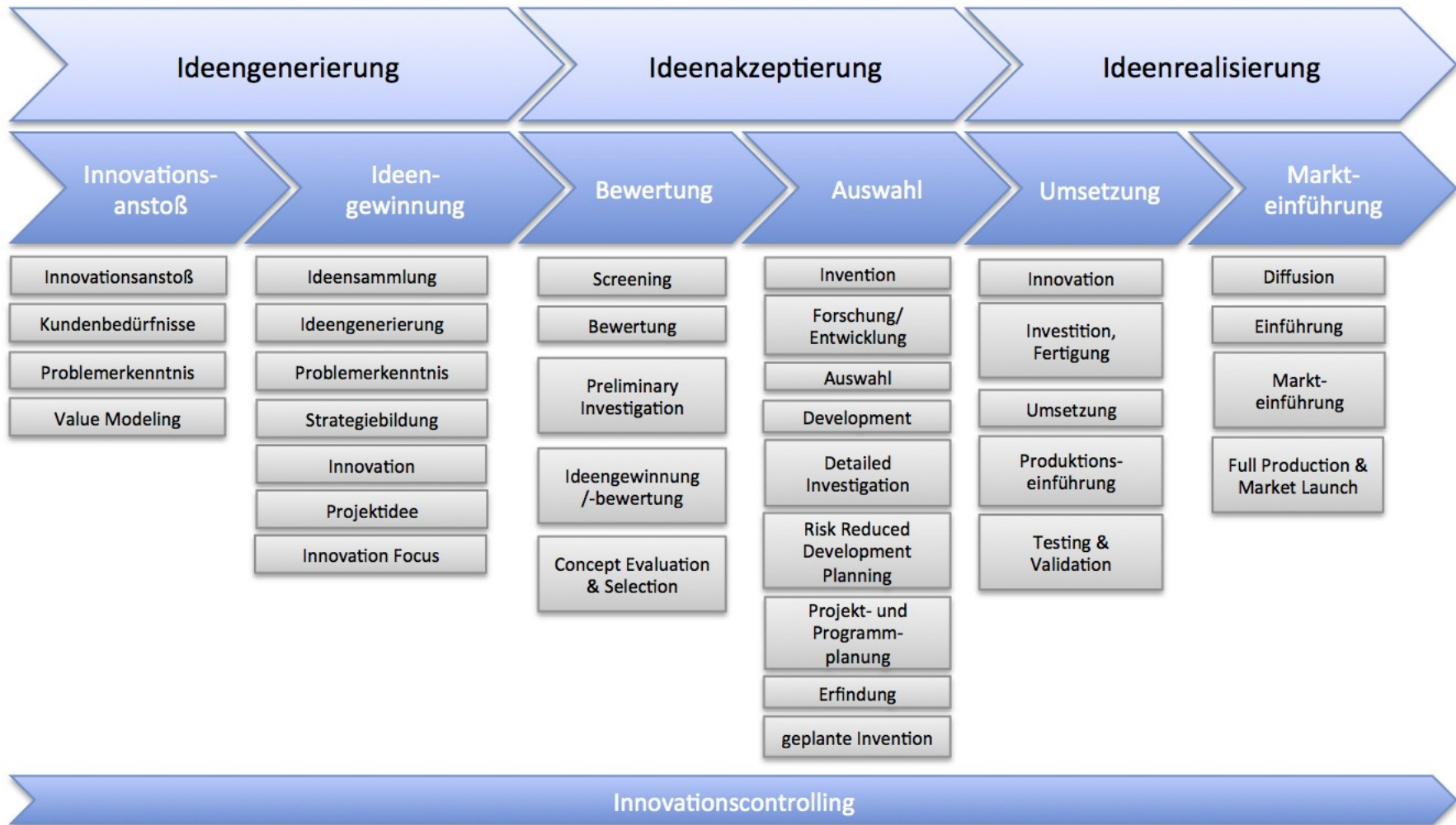
The Steps to Innovations (Innovation Process of Bosch Thermotechnik)

- ▶ [Fit für innovation, Arbeitskreis 1. <http://www.fitfuerinnovation.de/>
- ▶ http://www.fitfuerinnovation.de/wp-content/uploads/2011/07/Fit_Fuer_Innovation_AK1.pdf]
- ▶ Innovations need several conditions:



Innovation Process of Project Open4Innovation

Sebastian Eichler. Evaluation von webbasierten Innovationsplattformen und Konzeption einer geeigneten Softwarearchitektur für Open Innovation. Diplomarbeit. Fakultät Wirtschaftswissenschaften, TU Dresden, August 2011.



The End

- ▶ How are BMC and VPC related? Describe how to do a BMC-VPC innovation workflow on LINC.
- ▶ What is the difference of a canvas and a metamodel?
- ▶ Explain the three phases of canvas filling.
- ▶ How do you create questions for a canvas? Explain one of the instruments to get ideas.
- ▶ Why is pain important in the VPC?
- ▶ Why is change important for business?
- ▶ Explain the LeanCanvas. What is different to BMC?
- ▶ Describe how to do a Lean Canvas innovation workflow on LINC.
- ▶ Why is the Lean Startup process a specific innovation process?
- ▶ Why are canvases models?
- ▶ Which canvas you would recommend for Volkswagen in its 2015 crisis?

2. Basic Patterns and Tools for Lean Startup and Lean Innovation

Prof. Dr. Uwe Aßmann
Softwaretechnologie
Fakultät Informatik
Technische Universität Dresden
2020-0.4, 20-12-22
[http://st.inf.tu-dresden.de/
teaching/saab](http://st.inf.tu-dresden.de/teaching/saab)

- 1) The Innovator's Toolbox
- 2) Overview of Lean Startup
- 3) Evaluating a Canvas
- 4) Value Proposition Analysis
 - 1) nABC
 - 5) Lean Canvas
 - 6) Other Canvases
 - 7) Innovation Processes

Fragen: wie kann man das spannender machen?

Literature

- ▶ [Osterwalder-PhD]
http://www.hec.unil.ch/aosterwa/PhD/Osterwalder_PhD_BM_Ontology.pdf
- ▶ [Carlson-Wilmot] Curtis R. Carlson, William W. Wilmot. Innovation. The Five Disciplines for Creating what Customers Want SRI International. Crown Business, US, 2006
- ▶ [Oddoy] Manuel Oddoy. Softwareentwicklung mit natürlicher Sprache (“Lean Modelling”), Belegarbeit, TU Dresden, Jan. 2014. Supervised by Christian Wende, www.devboost.de
- ▶ [Korger] Christina Korger. Organisierte Software-Startups mit kollaborativen Canvases. Großer Beleg. TU Dresden, 2014.
 - <http://nbn-resolving.de/urn:nbn:de:bsz:14-qucosa-160539>



Startup of the Day

- ▶ Boreal builds water cleaning mini-factories
- ▶ <https://www.n-tv.de/wissen/Zwei-Berliner-entsalzen-Wasser-fuer-die-Welt-article22102812.html>
- ▶ <https://winture.de/>
- ▶ KfW Innovation Award
<https://www.kfw.de/KfW-Konzern/%C3%9Cber-die-KfW/KfW-Awards/KfW-Award-Gr%C3%BCnden/2019/>

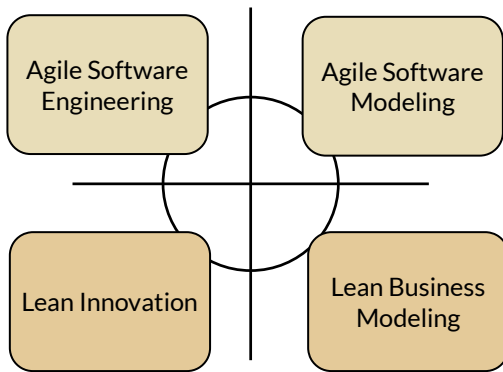




2.1 The Lean Innovator's Toolbox

Lean = Agile – what does this mean?

Lean or Agile Innovation or What?



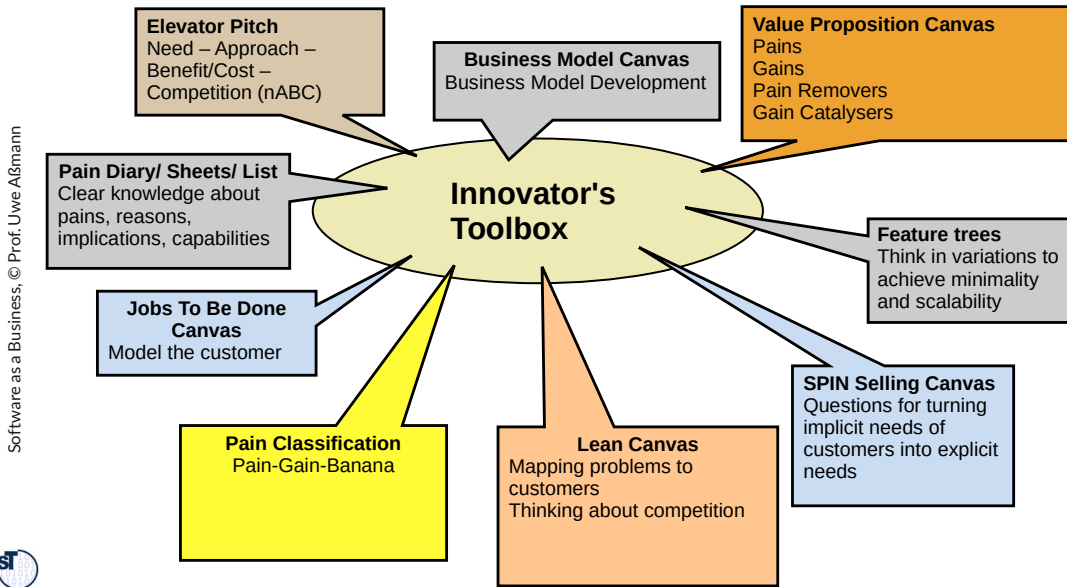
The Lean Innovator's Toolbox

- ▶ Every lean innovator needs a **toolbox** for his products or services he develops
 - Several important artefacts (lean models) are assembled. He/she should know them by heart.
- ▶ In the course, we will discuss these artefacts and how to mature them.
- ▶ The **innovator's toolbox** of this course:
 - NABC Elevator Pitch template (use this for pitches)
 - Working with Canvases (use them for business development)
 - The Business Model Canvas
 - The Value Proposition Canvas
 - The Lean Canvas
 - The Personal BMyou Canvas
 - The Customer Interview Canvas
 - Problem Analysis
 - from Pain Diary to systematic Pain Analysis
 - Selling with good questions



Q1: The Lean Innovator's Toolbox

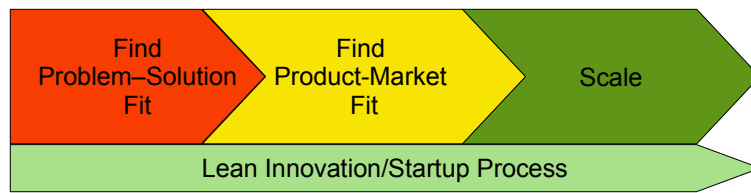
- ▶ Every innovator should have the following artefacts present and mature them over time



2.2 Overview on Lean Startup and Lean Innovation

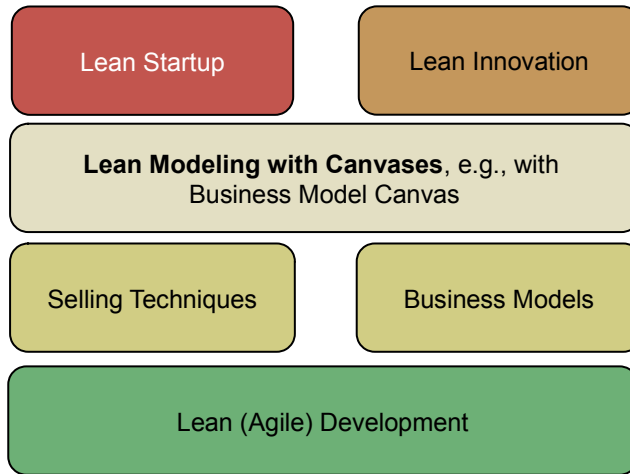
3 Process Steps to Lean Innovation and Startup

- ▶ Find a relevant problem
- ▶ Find a relevant product or service
- ▶ Find a scaling business model
- ▶ *Measure* the maturity of an innovation or startup (how far has it come in the innovation process)
 - By metrics
 - By hypothesis testing with customers (“get out of the building”)



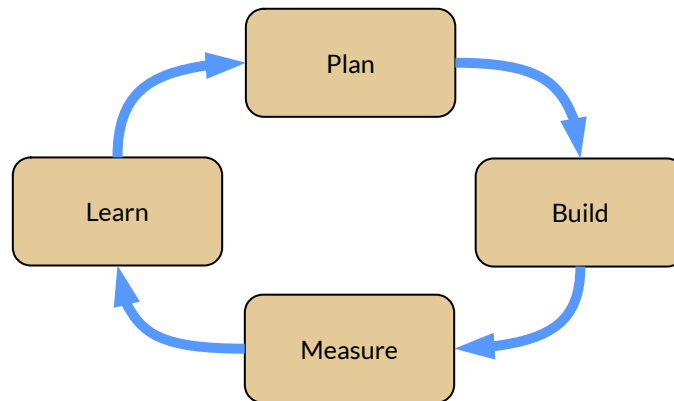
Lean Innovation Process in this Course

- ▶ The **lean innovation process** prototypes early to get early feedback (feedback-oriented process)
- ▶ **Insight: Business can be modeled and metamodeled**



The Lean Innovation (Startup) Spiral Model

- ▶ Instance of “Scientific Method” of Bacon and PDCA (Plan-Do-Check-Act)
- ▶ Plan - Build - Measure - Learn - cycle [Maurya, Ries]
- ▶ Developing “Business Model Canvases” containing “Customer Hypotheses”
- ▶ The “Learn” - “Plan” - “Build” - “Measure” Cycle is a variant of the Scientific Method and the PDCA.



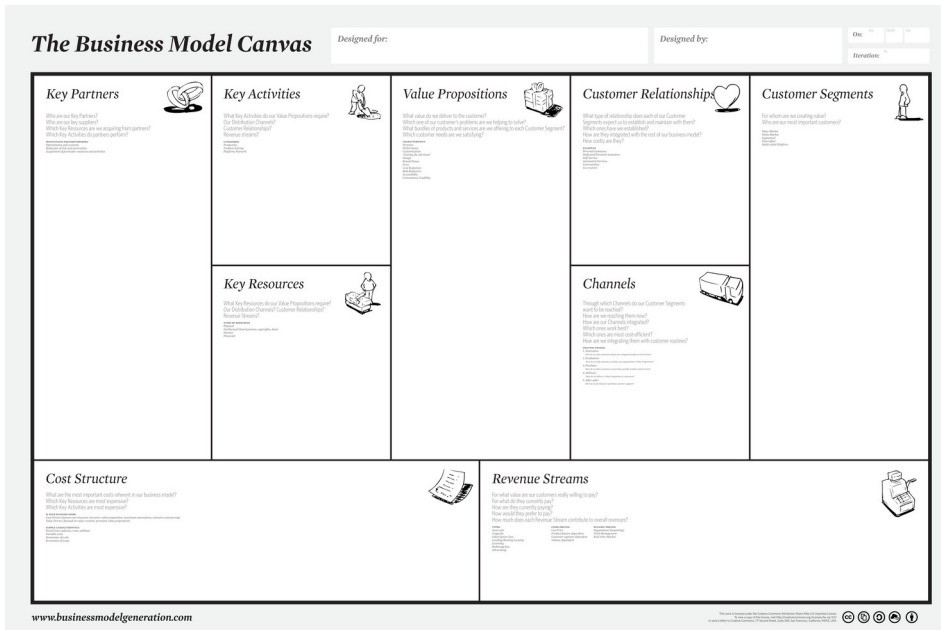
Business Model Generation with BMC Osterwalder/Pigneur

13 Software as a Business

▶ CC-BY-SA:

http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf

Software as a Business, © Prof. Uwe Altmann



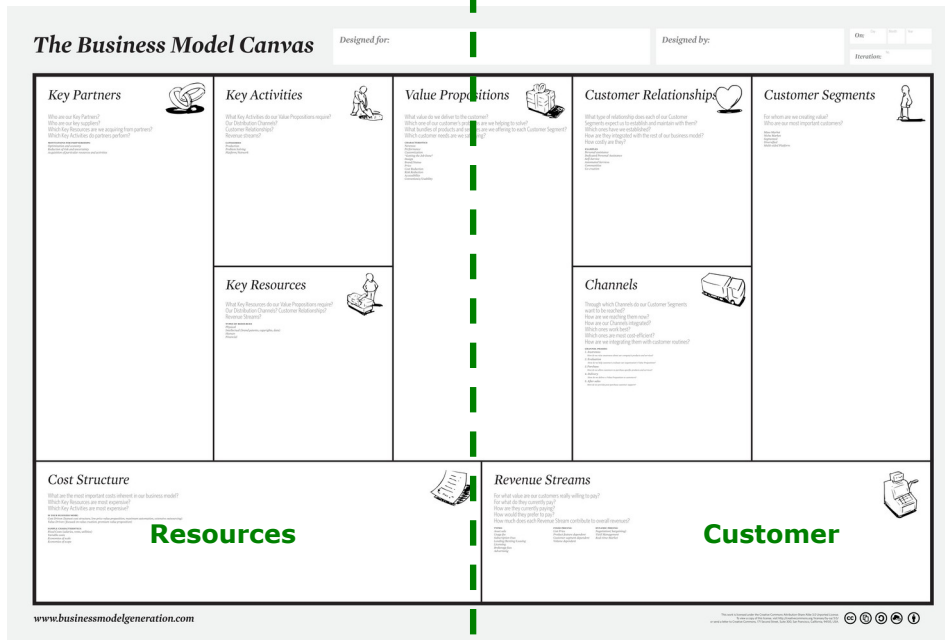
Business Model Analysis with the Business Model Canvas

- ▶ **Business model development** creates business models
 - For start up and placement of new products
 - [Osterwalder/Pigneur] suggest to split the business model in 9 parts, divided by input, output, and in between
- ▶ **Input (Resource) Side**
 - Cost vs Profit
 - Estimate costs! Cost leadership?
 - Estimate break-even point!
 - Distinguish cash flow and profit
- ▶ **Middle: Value Proposition and Pain Killing**
- ▶ **Output Side (Customer Side)**
 - Target customer group
 - Companies? End customers? [champagne]
 - Selling directly or via distributor?
 - Channels
 - Market entry strategy
 - Segmentation of the market



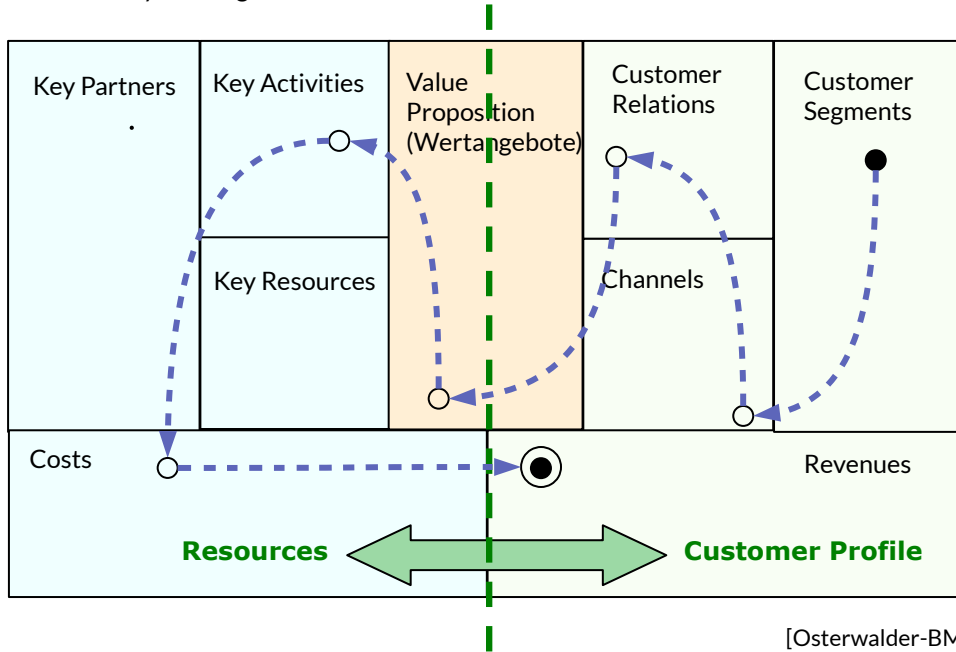
Bridging Two Worlds in BMC

- CC-BY-SA: http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf



Business Model Canvas Process

- ▶ Basically from right to left

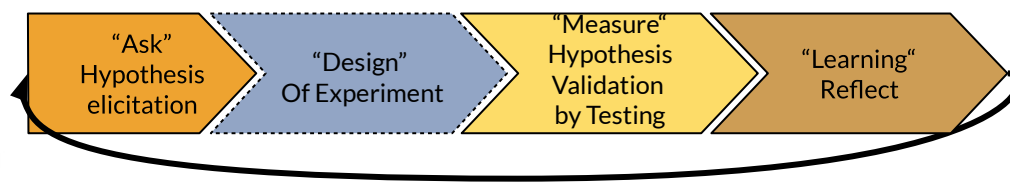


Every canvas has a fill order.

The BMC can be filled in several orders, a good one is customer-driven: from right to left.

Lean Hypothesis Testing Cycle in Customer Modeling (Blank/Dorf)

- ▶ **Customer Analysis (Customer Modeling)** is a variant of business model development that creates a trustworthy, realistic model of the customer of the product, his pains, his gains, his desires, her stakeholders, ...
- ▶ During customer modeling, **customer hypotheses** are proposed in form of BMC and validated (Lean Hypothesis Testing cycle, resulting over time in the BMC Cactus).
- ▶ The “Ask” - “Measure” - “Learning” Cycle is a variant of the Scientific Method and the PDCA.



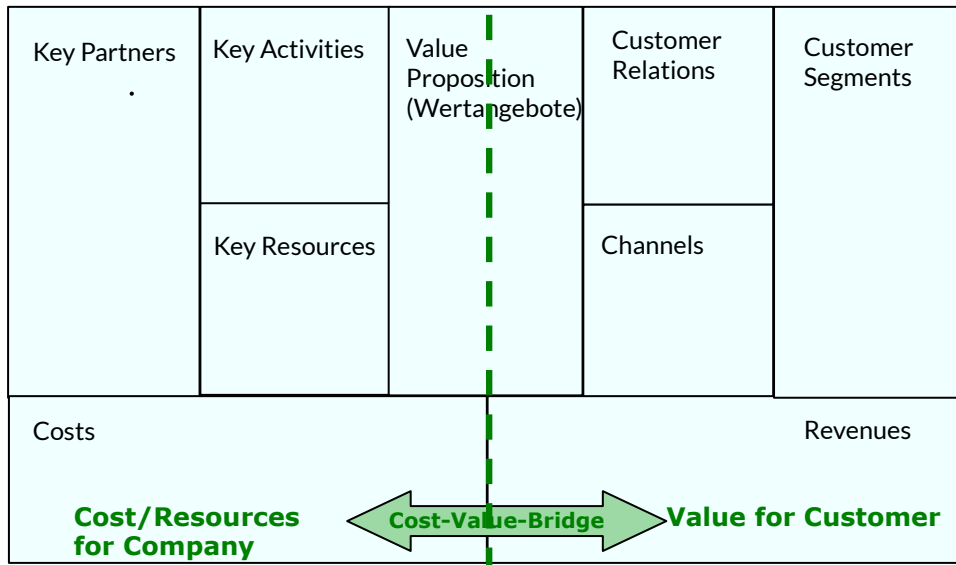
2.3 Canvases and other Analysis Instruments

- Lists, Trees, Link trees, Dags, Graphs, Canvases (planar)

The Modelling Aspect of Business Model Canvas

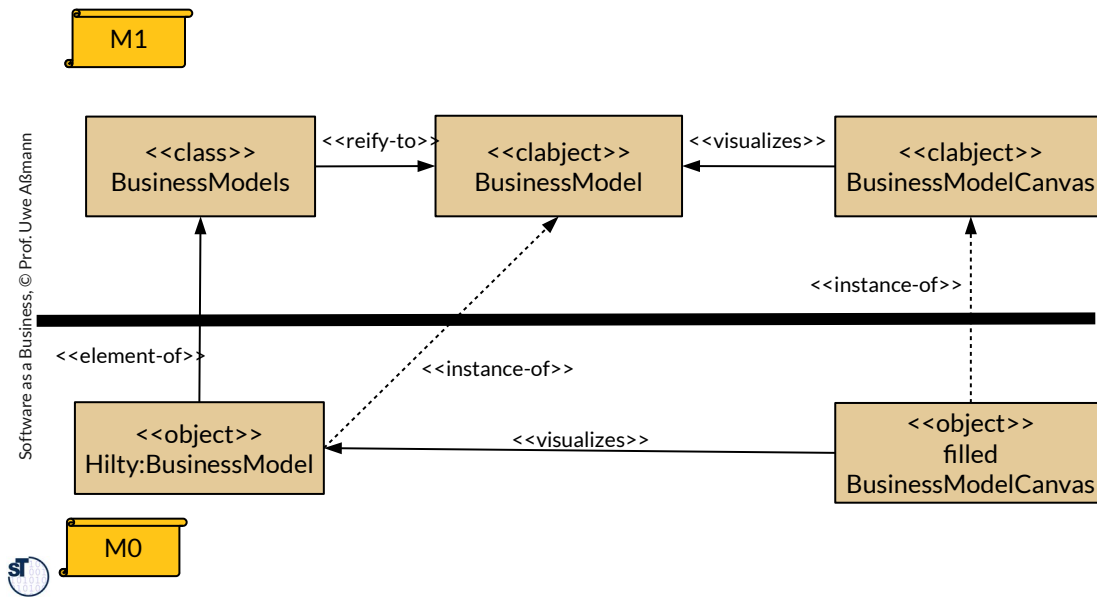
- ▶ BMC is based on a simple metamodel of business models (see MOST course)
- ▶ Its instances are business models

Software as a Business, © Prof. Uwe Altmann



Metamodels and the BMC

- ▶ One of the central insights of BMC is that a canvas is a *model* following a *metamodel* [Osterwalder PhD], see course “Model-Driven Software Technology (MOST)”



Instruments for Filling Canvases

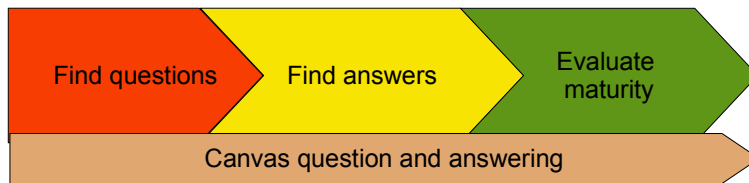
- ▶ Paper and Notes
- ▶ App
 - <http://www.businessmodelgeneration.com/canvas>
 - <https://strategyzer.com/app>
- ▶ Google docs
 - <http://scrumology.com/how-to-create-a-business-model-canvas-in-google-docs/>
- ▶ Fridolean platform (LINC) <https://fridolean.saab18.inf.tu-dresden.de/>
 - Nested canvases
 - Live editing of canvases
 - Linked with RocketChat do discuss online
 - Linked with codiMD to life-edit documents

A **canvas** is a form to collaboratively brainstorm a model.



Canvas question and answering - how to Work with Question-based Canvases

- ▶ Finding answers to the fields of a canvas is easier, if you have defined questions before
 - Some canvases, like the BMC, state pre-defined questions.
 - For others, you have to find questions yourself
- ▶ You can use for questions many methods:
 - the “Honest Serving Men” of Kipling
 - The SWOT “strategic” analysis (strengthes, weaknesses, opportunities, trends)
 - The CoTIQQ cost analysis (cost, time, quality, quantity)
 - The BeNiSiLo improvement analysis (Better, Nicer, Simpler, Longer-lasting)
- ▶ Answers can be quite unrealistic and immature. Evaluate maturity of canvas fields by
 - Asking experts
 - Check cross-constraints
 - Evaluation of metrics



Different Purposes of Canvases

- ▶ A **canvas** has different purposes. It is a model with a metamodel, so it inherits the benefits of the language of its metamodel

Bridging two (left and right) Worlds

- Partner – Customer (BMC)
- Problem – Customer (LC)
- Pain – Pain killer (VPC)

Brainstorm (Q&A) Canvas

- Structured process for excellent elicitation
- Finding answers to the questions
- Brainwalking with many persons

Question-based Canvas

- To generate questions for interviews with customers and stakeholders

Structured Process

- Use the experiences of metamodels others have collected for you
- Evaluate canvas maturity by asking evaluation questions

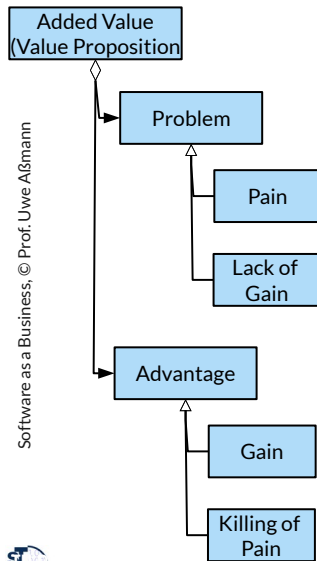




2.4 Value Proposition Analysis

Value Proposition (Pain-Gain Analysis) for the Customer

- ▶ **Value proposition analysis** finds a *real problem (pain)* of the customer, or a *real win (gain)*. It is a subprocess of Business model development.



Software as a Business, © Prof. Uwe Aßmann



Make sure your innovation is a ***pain killer*** and not just a ***vitamin***.

David Ladd, venture partner at Mayfield Fund
[Carlson/Wilmot]

Pain killers are too dangerous, you only get them on prescription – but we have a large set of ***vitamins***.

[Swedish pharmacist, when Aßmann asked for Korodin Kreislaufftropfen]

[Ein Unternehmer] hat einen Spürsinn für das, was die Leute brauchen oder zu brauchen glauben.
Urs Wälterlin. Weit weg im Outback.]

“Pain-Gain” Value Proposition Canvas [Osterwalder]

- ▶ Gains
- ▶ Pains
- ▶ Customer Jobs
- ▶ Gain Creators
- ▶ Pain Relievers
- ▶ Products and services

Download for personal use

http://www.businessmodelgeneration.com/downloads/value_proposition_canvas.pdf

Background:

<http://businessmodelalchemist.com/2012/09/test-your-value-proposition-supercharge-lean-startup-and-custdev-principles.html>

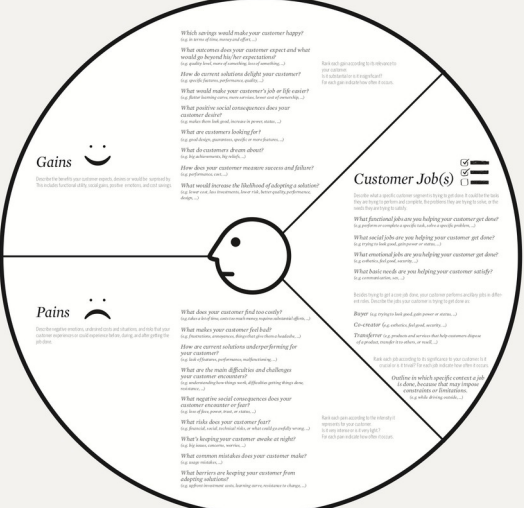


The Value Proposition Canvas

Designed for:

Designed by:

On:
Iteration:



Value Proposition
Create and fit each Customer Segment in your Business Model

www.businessmodelgeneration.com

Customer Segment

Use in Conjunction with the Business Model Canvas

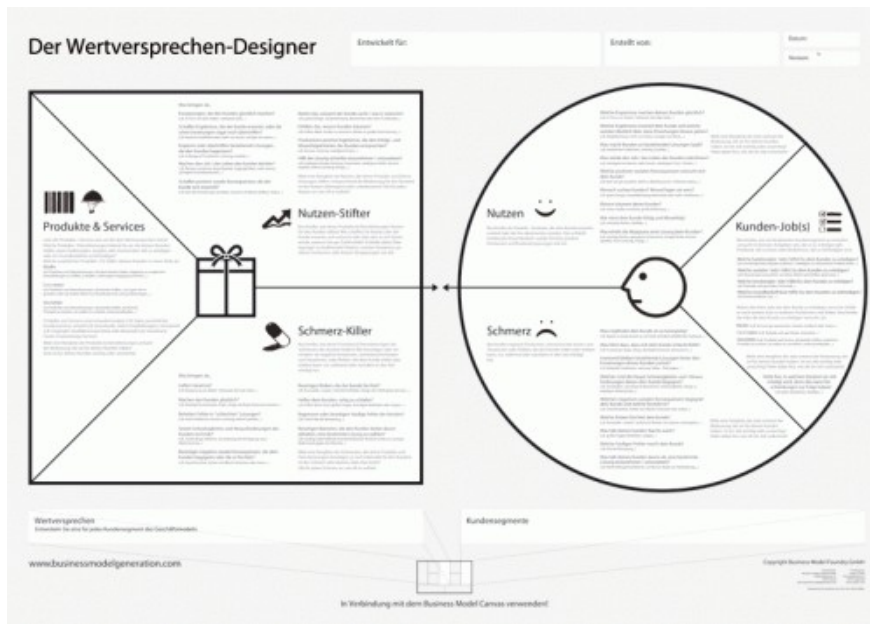
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<http://businessmodelalchemist.com/>

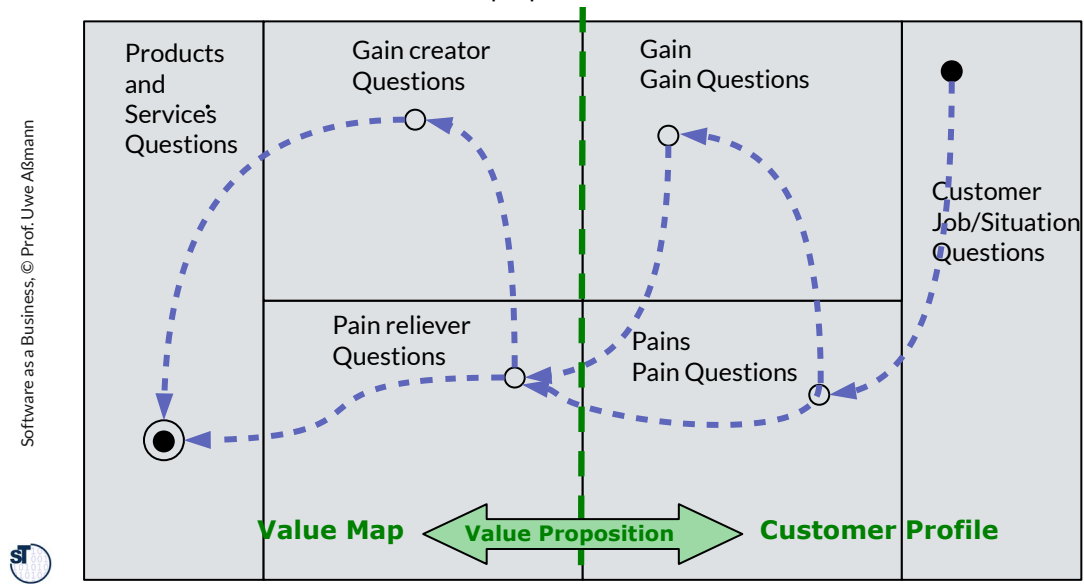
http://geschaeftsmodellcoach.de/assets/Bilder/_resampled/resizedimage501353-valuepropositiondesignergif.gif

Software as a Business, © Prof. Uwe Altmann



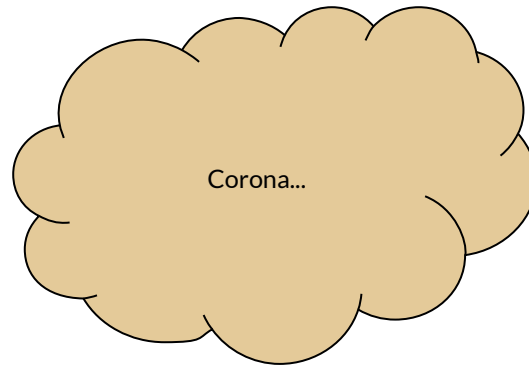
VP Canvas Process

- ▶ [Osterwalder-OPC] VPA uses a canvas to map the customer pains and gains to products and services
- ▶ The VPC defines the field “value proposition” of the BMC



Problem / Pain Diary

- ▶ Def.: A **pain diary** is a diary in which all problems, pains, deficiencies of techniques and tools are recorded day by day
- ▶ <https://md.saab18.inf.tu-dresden.de/ProblemDiary>
- ▶ Problems are *pains* if they press the customer a lot



ZDF, 2020-09-15



Corona aktuell: Alles zum Coro... x New Tab - Unsplash Instant x +

zdf.de/nachrichten/politik/blog-coronavirus-102.html


Apps ST-VL-SS ST-Portale ST Proj Acq Contacts Courses Day Dean Info » Andere Lesezeichen

ZDF Rubriken A-Z Live-TV Sendung verpasst Suche Mein ZDF

14.09.2020, 09:45 Uhr

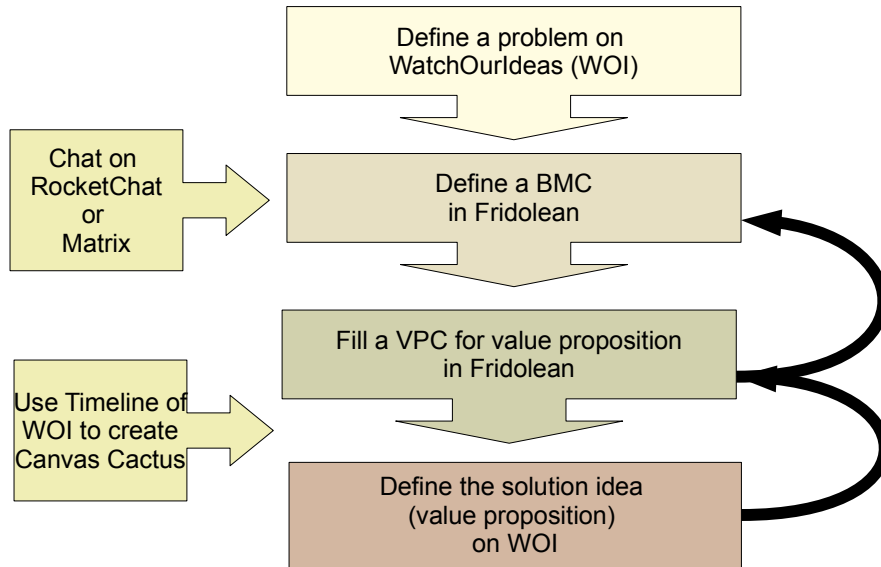
Vietnam: Schüler entwickeln Corona-Schutzhelm - "Vihelm"

Drei vietnamesische Schüler haben einen Helm entwickelt, der Beschäftigte im Gesundheitswesen vor Corona schützen und ihnen zugleich ermöglichen soll, etwas zu essen oder sich mal den Schweiß von der Stirn zu wischen, ohne sich dem Virus auszusetzen. Dazu ist der Helm mit einer speziellen Handschuh-Box ausgestattet. Der Name "Vihelm" leitet sich ab aus den beiden Wörtern "Vietnam" und "helmet" (engl. für Helm).



BMC-VPC Innovation Workflow on LINC

Software as a Business, © Prof. Uwe Altmann

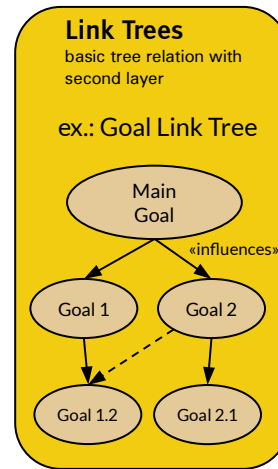
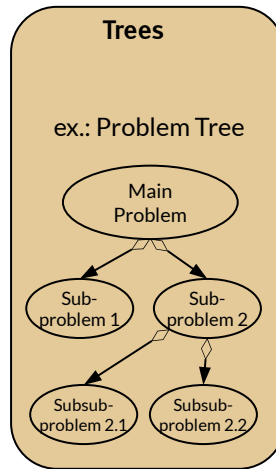
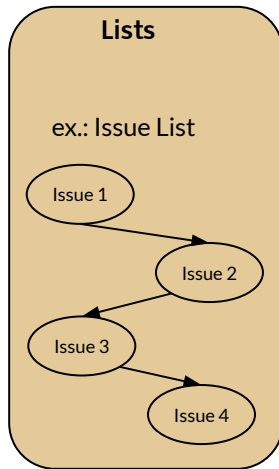


2.4.1. Excursion: Canvases are Link-Tree Models

- This is one of the basic topics of course „Softwaretechnologie II“

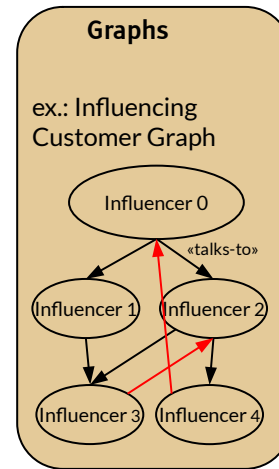
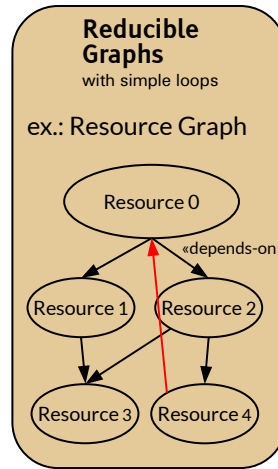
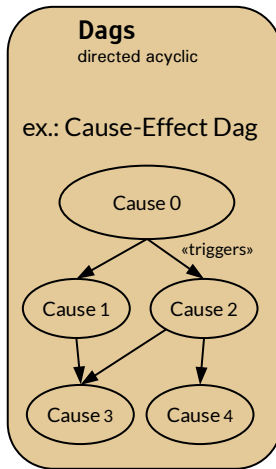
Other, Hierarchic Models

- ▶ For values, problems/pains, gains, customers, channels, resources etc. we need not only canvases but all kinds of *hierarchic (structured)* models:



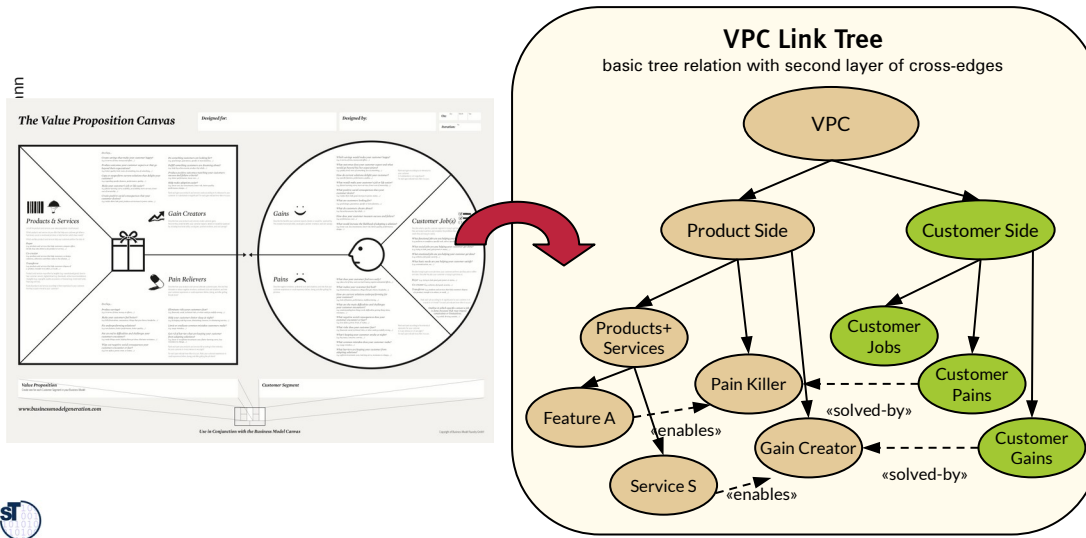
Graph-Like Models

- ▶ Trees and link trees are *simpler structures* than these here:



How to Turn the Canvas into a Link-Tree Model

- ▶ Areas of the canvas turn into nodes of the model
- ▶ Cross-edges are created from the semantic dependencies of the canvas fields
- ▶ Q: can the link tree be a cyclic graph? What does a cycle mean?



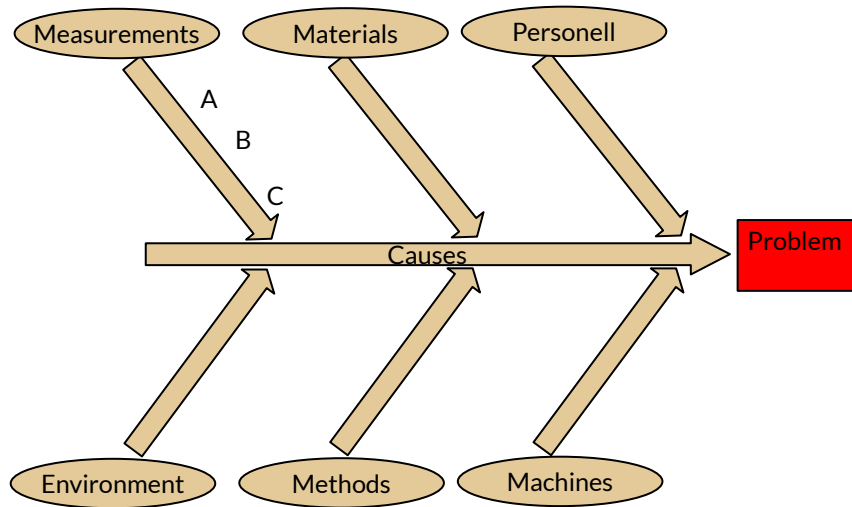
Can you morph a BMC into a link-tree model?

Q: Why are link trees good representations for canvases?

Ishikawa Fishbone Canvas

Example with 6 Facets (Tree Model)

- ▶ Cause-Effect Tree of Reasons and caused problems
- ▶ For different domains, Business or Software Engineering, different facets can be used



This “Fishbone Diagram” is already a tree in its visualization.

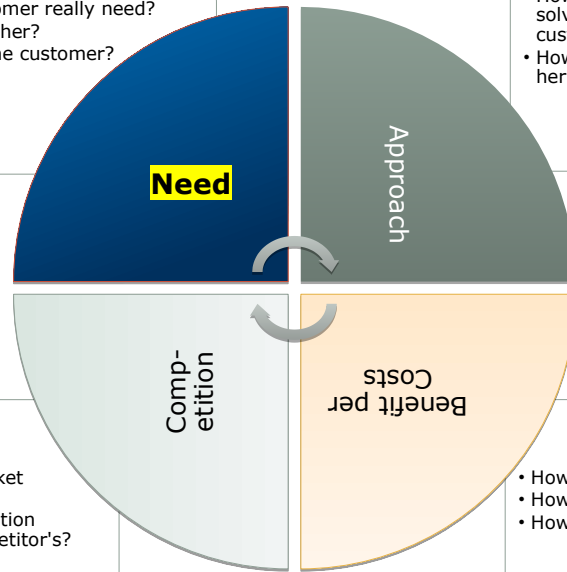
2.4.2 Value Proposition Analysis with nABC

- NABC is a fantastic 4-step scheme for summarizing your idea for a new product or service.
- Learn it by heart, it will change your life.

NABC Analysis [Carlson-Wilmot]

- What does the customer really need?
- What is of value for her?
- What is a *pain* for the customer?

- How does your company solve the needs of the customer?
- How does it create value for her?



- Who is in the market already?
- How does our solution improve the competitor's?

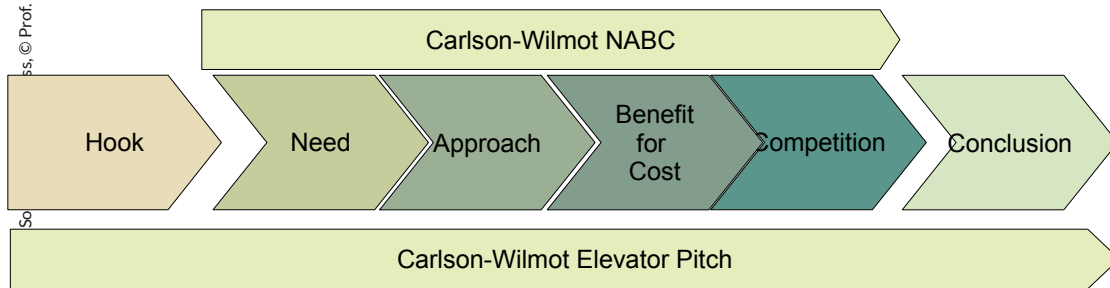
- How efficient is the solution?
- How large is the benefit?
- How large are the costs?



NABC Elevator Pitch

- ▶ An **elevator pitch** is a 2-minute speech about the value proposition (problem-solution analysis) of your PhD thesis project
 - You should be able to tell it an important investor in an elevator (2 min)
- ▶ It combines a problem solving pattern such as NABC with a hook, a gripping introductory remark
 - You may use any other pattern, too

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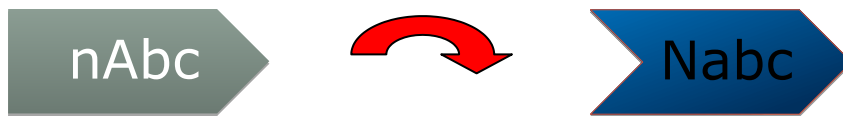


So



Exercise: Application

- ▶ For preparing your next application for a job,
- ▶ Analyze the future employer with NABC
 - What are his needs?
 - What is your approach?
 - What is his benefits?
 - Who are your competitors?
- ▶ Learn the answers for these questions by heart, to be able to present them in the interview!
- ▶ Advanced: Turn your NABC pitch into a link-tree model. What is the primary relation, what is the secondary links?



Story Telling Canvas /(Strategyzer)

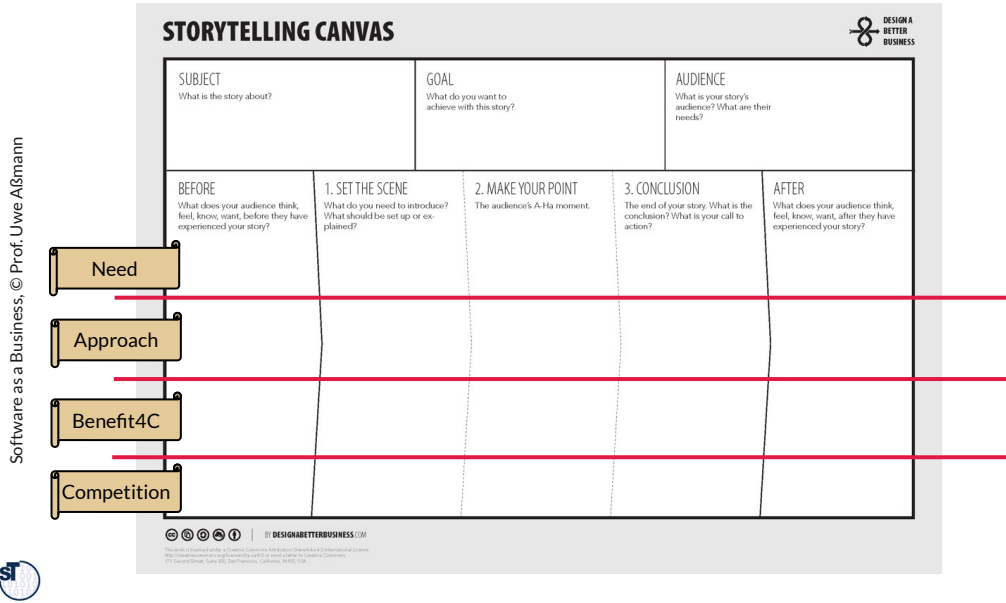
- ▶ You can pack the NABC also into a Story, telling N, A, B, and C.



STORYTELLING CANVAS					DESIGN A BETTER BUSINESS
SUBJECT What is the story about?		GOAL What do you want to achieve with this story?		AUDIENCE What is your story's audience? What are their needs?	
BEFORE What does your audience think, feel, know, want, before they have experienced your story?	1. SET THE SCENE What do you need to introduce? What should be set up or explained?	2. MAKE YOUR POINT The audience's A-Ha moment.	3. CONCLUSION The end of your story. What is the conclusion? What is your call to action?	AFTER What does your audience think, feel, know, want, after they have experienced your story?	
<small>© 2012 Strategyzer, Inc. DESIGNABETTERBUSINESS.COM The Storytelling Canvas is a trademark of Strategyzer, Inc. All rights reserved. Strategyzer, Inc. is a registered trademark of Strategyzer, Inc. in the United States and other countries. 171 Second Street, Suite 300, San Francisco, California, 94105, USA</small>					

Story Telling Canvas /(Strategyzer)

- ▶ You can pack the NABC also into a Story, telling N, A, B, and C.





2.5 Lean Canvas

- Bridging problems, solutions, and customers
- An important variant of the BMC for problem-solution analysis of customers
- Combining BMC and VPC













Lean Canvas [Maurya]

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
	Key Metrics		Channels	
Cost Structure			Revenue Streams	

Lean Canvas is adapted from The Business Model Canvas (<http://www.businessmodelgeneration.com>) and is licensed under the Creative Commons Attribution-Share Alike 3.0 Un-ported License.



Lean Canvas [Neos Chronos Version]

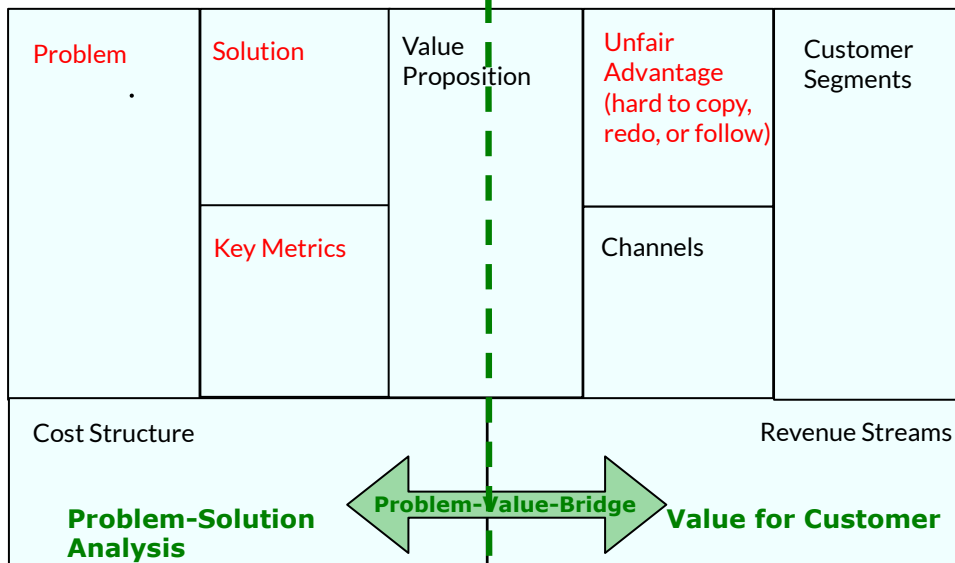
The Lean Canvas		Designed for:	Designed by:	Date:	Version:
		Startup Name	Name1, Name2, ...	DD/MM/YYYY	X.Y
Problem  Top 3 problems	Solution  Top 3 features	Unique Value Prop.  Single, clear and compelling message that states why you are different and worth buying	Unfair Advantage  Can't be easily copied or bought	Customer Segments  Target Customers	
Existing Alternatives  List how these problems are solved today.	Key Metrics  Key activities you measure	High-Level Concept  List your X for Y analogy (e.g. YouTube = Flickr for videos)	Channels  Path to customers	Early Adopters  List the characteristics of your ideal customers.	
Cost Structure  List your fixed and variable costs. Customer acquisition costs Distribution costs Hosting People Etc.			Revenue Streams  List your sources of revenue. Revenue Model Life Time Value Revenue Gross Margin		

Lean Canvas is adapted from The Business Model Canvas (www.businessmodelgeneration.com/leancanvas). PowerPoint implementation by: Neos Chronos Limited (<http://neoschronos.com>). License: CC BY-SA 3.0

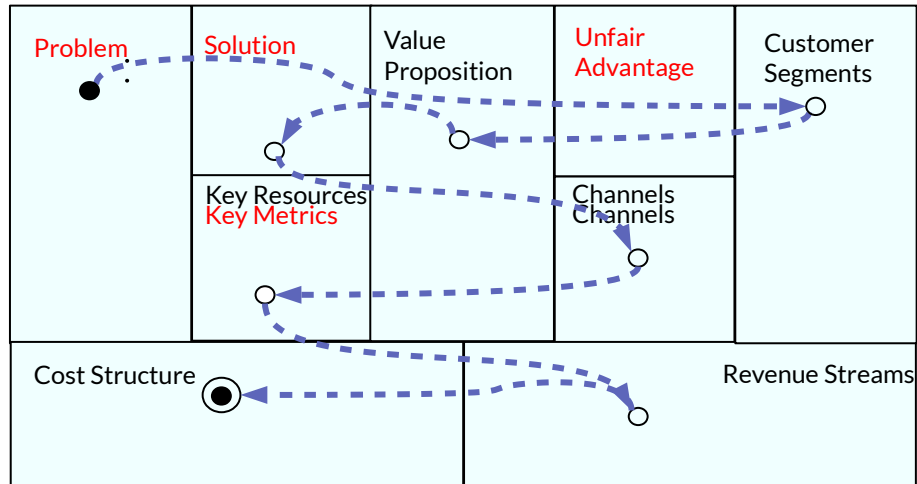


Lean Canvas [Maurya] [<http://leancanvas.com/>]

- ▶ The Lean Canvas substitutes the Cost Subcanvas by the Problem-Solution-Key-Metrics Subcanvas
- ▶ The Lean Canvas supports Problem-Objective-Solution-analysis (POA)

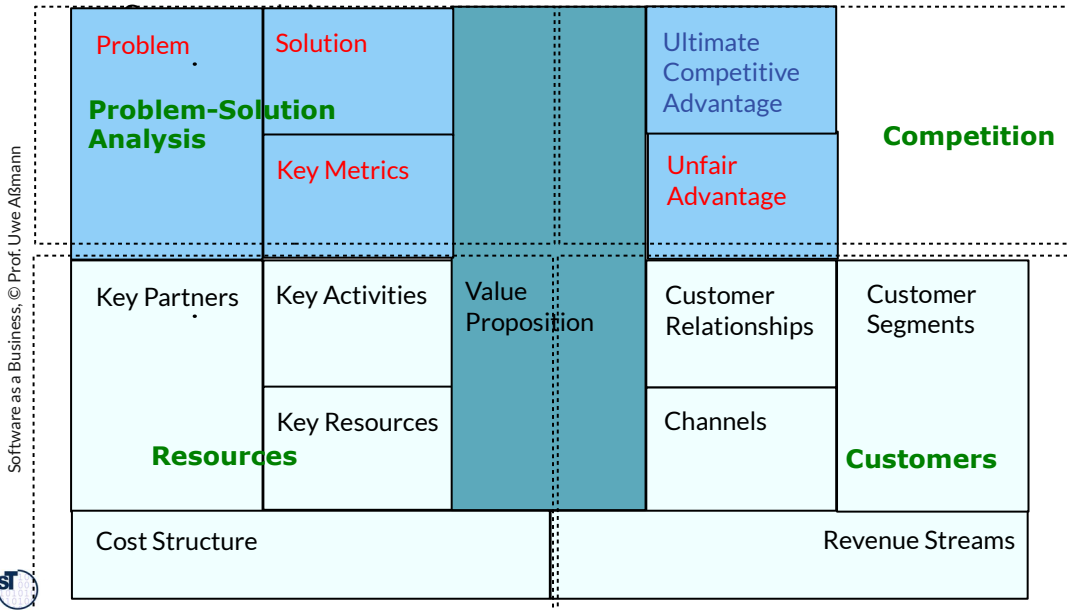


- ▶ The Lean Canvas substitutes the Cost Subcanvas by the Problem-Solution-Key-Metrics Subcanvas
- ▶ The Lean Canvas supports Problem-Objective-Solution-analysis (POA)
- ▶ The fill order is top-down outside-in

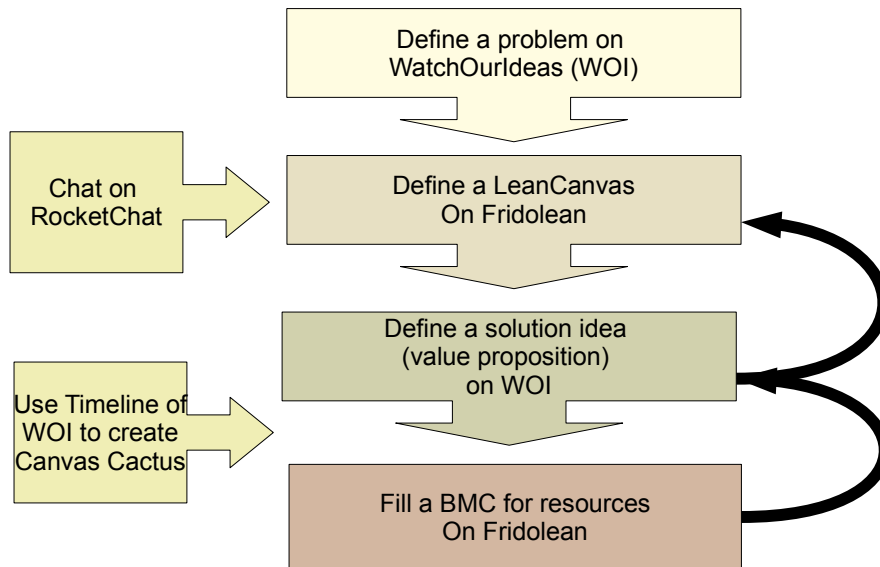


Lean Canvas Combined with BMC (Lean Business Model Canvas, LBMC)

- ▶ The Lean Canvas and the BMC can be unified by adding the subcanvases
- ▶ The LBMC supports Problem-Objective-Solution-analysis (POA), Competition analysis,



Lean Canvas Innovation Workflow on LINC



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2.6 Other Canvases

Business Model You Canvas (BMYC)

- ▶ The BMYC is a canvas for your personal life and career development, inspired by the BMC. <http://businessmodelyou.com/>
 - http://www.ideogram.us/BMY_preview/Business_Model_You_preview.pdf
 - <https://leancanvas.org/resources/canvases/>
- ▶ It can also be used for customer analysis

Name: _____'s Personal Business Model Canvas

Who helps you (Key Partners) 	What you do (Key Activities) 	How you help (Value Provided) 	How you interact (Customer Relationships) 	Who you help (Customers) 
	Who you are & what you have (Key Resources) 		How they know you & how you deliver (Channels) 	
What you give (Costs) 		What you get (Revenue and Benefits) 		



Personal Value Proposition with the Personal BMC (BMYC)

[<http://businessmodelyou.com/>]

- ▶ The BMYC is for the development of your career and yourself, also for customer analysis

Key Partners Who helps You?	Key activities What do you do?	Value Proposition How do you help?	Customer Relationships How do you interact?	Customer Segments Whom do you help?
	Key Resources What you are and have		Channels How do they know you? How do you deliver?	
Cost Structure What do you give?			Revenue Streams What do you get?	



Customer Journey Canvas for Services

Software as a Business, © Prof. Uwe Altmann



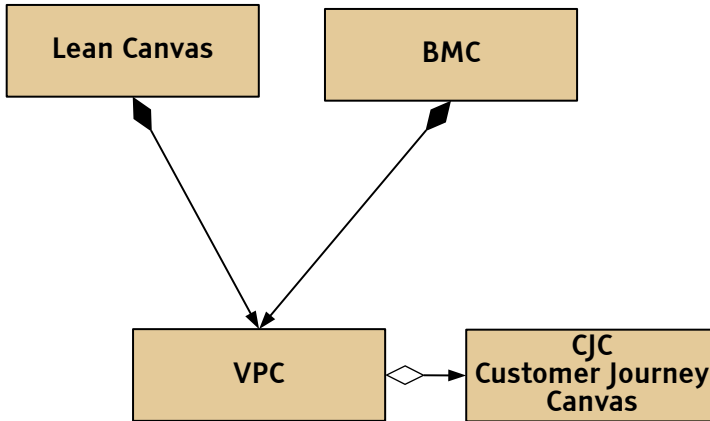
Customer Journey Canvas for Services (CJC)

- ▶ Service design is very important for young companies (→ chapter “Business models”)
 - A lightweight way to create business and customer relations
- ▶ CJC allows for brainstorming about all **customer touchpoints**, contact points with the customer during the service
 - <http://thisisservicedesignthinking.com/>
- ▶ <http://www.servicedesigntools.org/tools/8>
- ▶ On this website, you may edit several canvases, also the CJCS
 - <https://canvanizer.com/choose-canvas>



The Dependency Structure of Canvases

- ▶ Some canvases are subcanvases of others.
- ▶ Here is a little metamodel excerpt
- ▶ How would you maintain a cactus for all these canvases?



2.7 Other Innovation Processes

- An *innovation process* is a systematic way to generate innovations in a company or in a startup
- There are other innovation processes than Lean Startup

Innovation Process acc. to [Scholtissek]

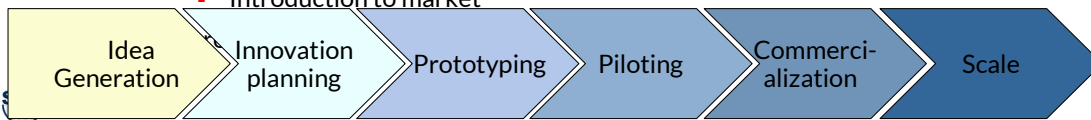
- ▶ **Idea generation** with idea generation techniques
 - Idea management mit Idea Management Systems (IMS)
 - Idea labs and workshops
 - House-of-Quality – Idea matrix crossing requirements and ideas
- ▶ **Innovation planning**
 - Marketing concept
 - Market analysis
 - Idea Detailed Analysis with Questions acc. to Scholtissek
- ▶ **Prototyping** (realizability)
- ▶ **Piloting**
 - Market research about customer acceptance
 - Test phase
- ▶ **Commercialization**
 - Introduction to market

BMC
VPC

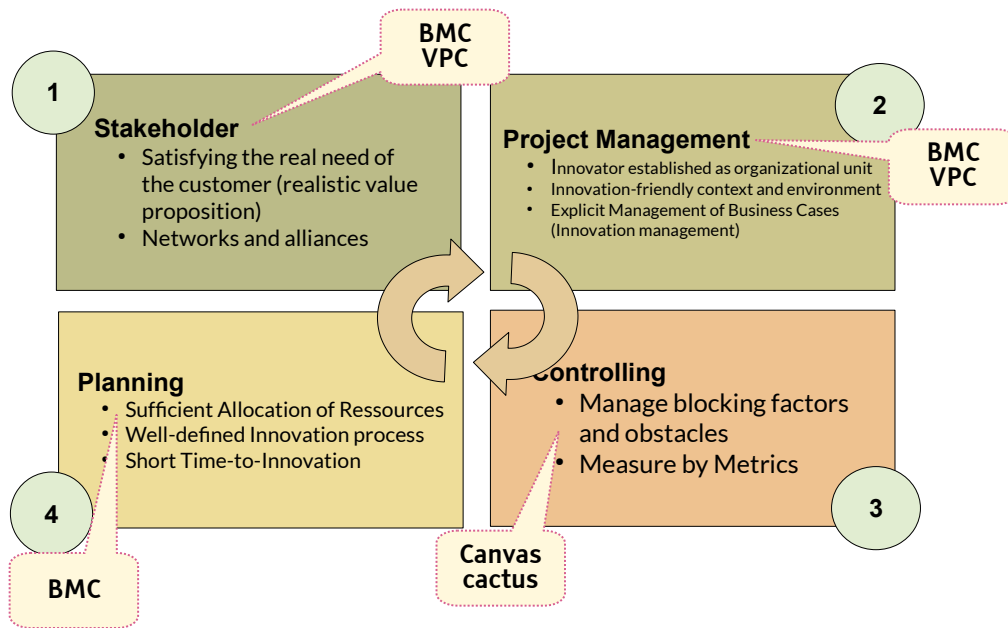
BMC
VPC

VPC

VPC



Success Factors of Innovation Processes acc. to [Scholtissek]



Statistical Innovation Process Metrics (-KPI) acc. To [Scholtissek]

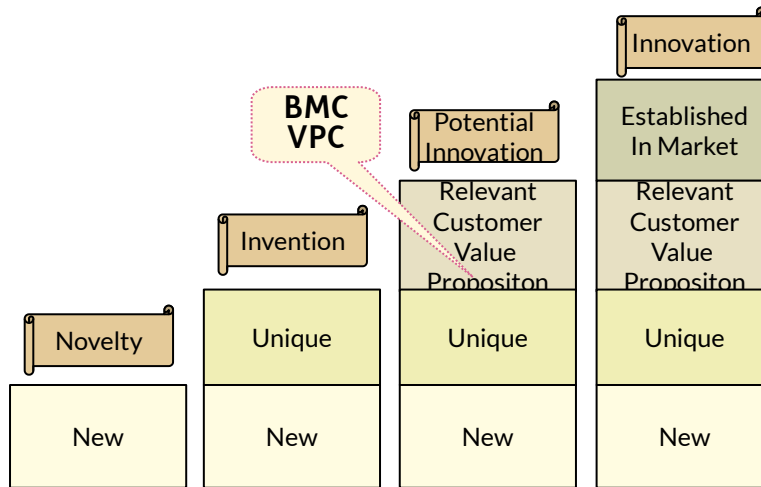
Acc. To Scholtissek, every innovation process needs:

- ▶ **Metrics for Idea Generation**
 - Number of Innovation Ideas of employees
 - Number of filled or matured canvases
 - Number of ideas per process step
- ▶ **Metrics for efficiency of innovation** (utility, investments vs cost per innovation)
 - Turnaround of the new products in the last years
 - Rise in market share due to the new products
 - Cost reduction by process innovation
 - Cost for research and development in relation to turnaround
- ▶ **Time of Innovation Process (Time-to-Innovation)**
- ▶ **Different innovation types**
 - Product, process, business model innovation, etc.
 - Evolutionary, revolutionary, disruptive



The Steps to Innovations (Innovation Process of Bosch Thermotechnik)

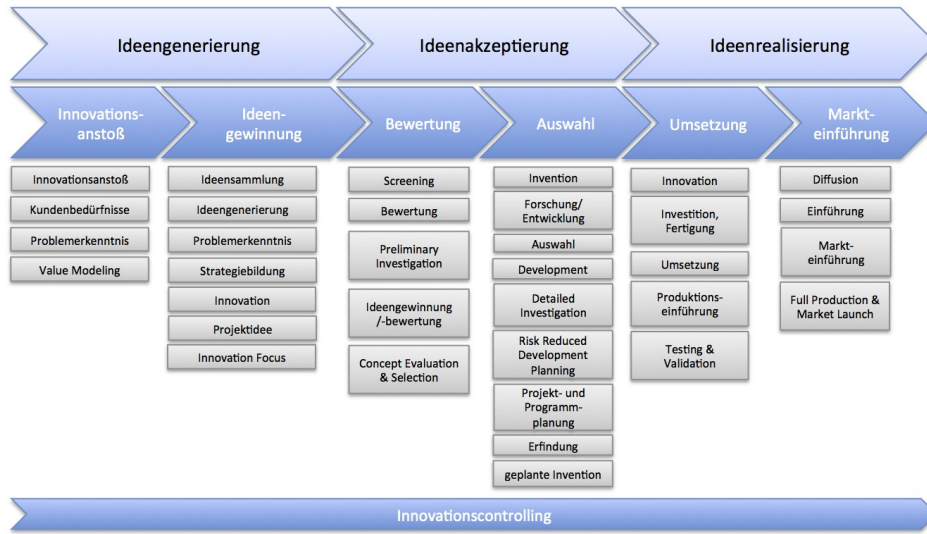
- ▶ [Fit für innovation, Arbeitskreis 1. <http://www.fitfuerinnovation.de/>
- ▶ http://www.fitfuerinnovation.de/wp-content/uploads/2011/07/Fit_Fuer_Innovation_AK1.pdf]
- ▶ Innovations need several conditions:



Innovation Process of Project Open4Innovation

Sebastian Eichler. Evaluation von webbasierten Innovationsplattformen und Konzeption einer geeigneten Softwarearchitektur für Open Innovation. Diplomarbeit. Fakultät Wirtschaftswissenschaften, TU Dresden, August 2011.

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The End

- ▶ How are BMC and VPC related? Describe how to do a BMC-VPC innovation workflow on LINC.
- ▶ What is the difference of a canvas and a metamodel?
- ▶ Explain the three phases of canvas filling.
- ▶ How do you create questions for a canvas? Explain one of the instruments to get ideas.
- ▶ Why is pain important in the VPC?
- ▶ Why is change important for business?
- ▶ Explain the LeanCanvas. What is different to BMC?
- ▶ Describe how to do a Lean Canvas innovation workflow on LINC.
- ▶ Why is the Lean Startup process a specific innovation process?
- ▶ Why are canvases models?
- ▶ Which canvas you would recommend for Volkswagen in its 2015 crisis?

