

32. Staged Configuration with Key Partners and Stakeholders

Prof. Dr. Uwe Aßmann

Technische Universität Dresden

Software Engineering Group

Version 20-0.4, 22.12.20

<http://st.inf.tu-dresden.de>

- 1) Staged configuration of value, feature, and component trees
- 2) The triple-layer BMC

Obligatory Literature

- ▶ [Joyce] Joyce, A., Paquin, R.L., The triple layered business model canvas: A tool to design more sustainable business models, Journal of Cleaner Production (2016), <http://dx.doi.org/10.1016/j.jclepro.2016.06.067>
- ▶ Kwanwoo Lee, Kyo C. Kang, and Jaejoon Lee. Concepts and guidelines of feature modeling for product line software engineering. Lecture Notes in Computer Science, 2319:62--78, 2002. Good overview on feature models, and how to develop feature groups in different concerns
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Other Literature

- ▶ Don S. Batory. Feature models, grammars, and propositional formulas. In J. Henk Obbink and Klaus Pohl, editors, Software Product Lines, 9th International Conference, SPLC 2005, Rennes, France, September 26-29, 2005, Proceedings, volume 3714 of Lecture Notes in Computer Science, pages 7--20. Springer, 2005.
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Shortcomings of Lean Startup from the Viewpoint of Software Product-Line Engineering

No support for consistent modeling of product lines
(no support for feature modeling and feature variation)

No support for canvas modeling
(composition and engineering)



No support for staged feature configuration with suppliers

No support for grading and metrics










31.1. Staged Configuration of Feature Models and Triple Bigraphs

Suppliers in a Supply Chain

The Business Model Canvas

Designed for: _____ Designed by: _____

On: Day Month Year
Iteration: No.

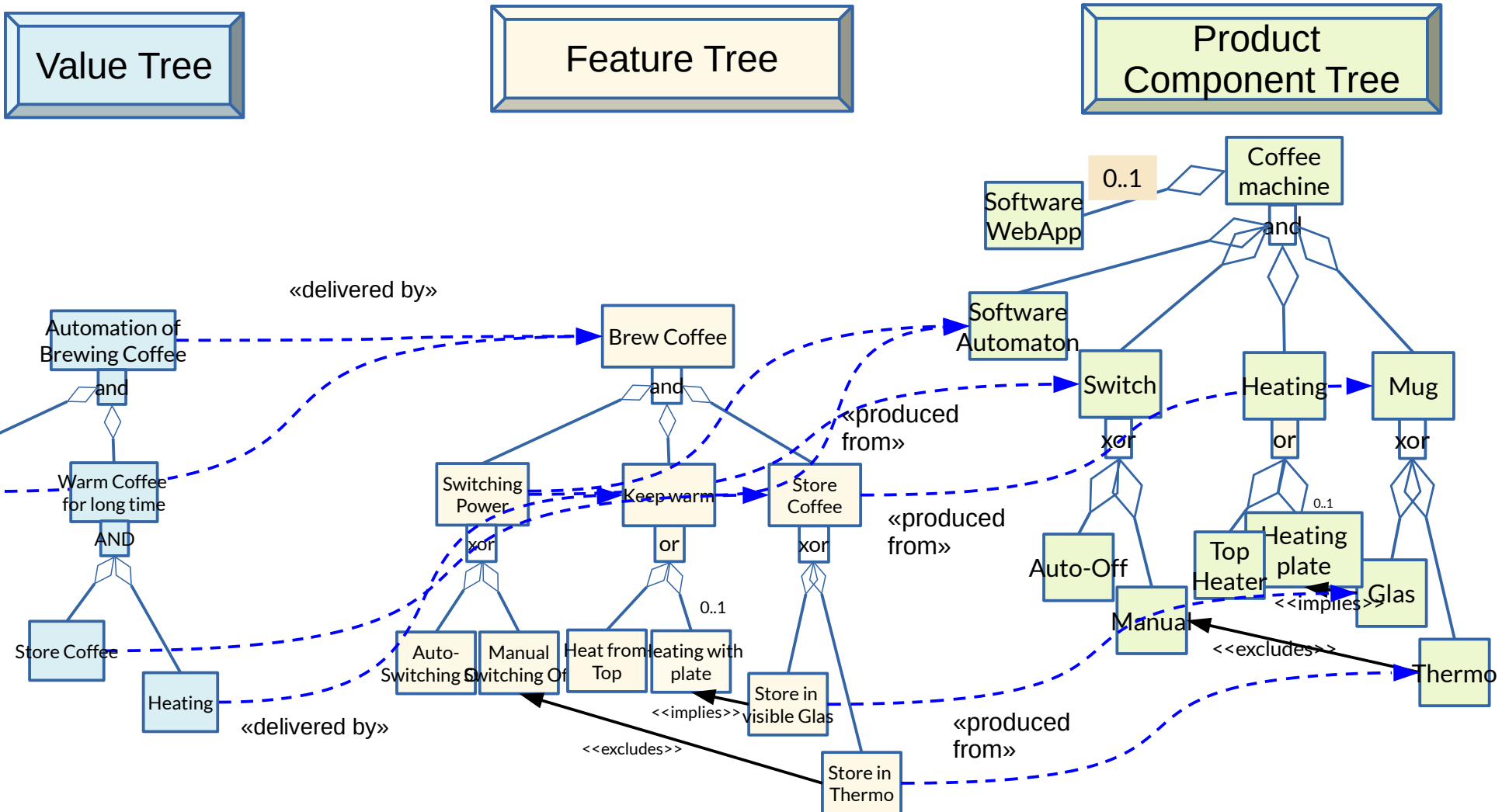
<h3>Key Partners</h3>  <p>Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?</p> <p>KEY ACTIVITIES FOR PARTNERS: Logistics and assembly Production of raw material components Acquisition of particular resources and activities</p>	<h3>Key Activities</h3>  <p>Why? Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?</p> <p>KEY ACTIVITIES: Production Customer service "Selling the ice cream" Design Market testing Sales Cost reduction Risk reduction Accessibility Customer loyalty</p>	<h3>Value Propositions</h3>  <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 ice cream" Design Market testing Sales Cost reduction Risk reduction Accessibility Customer loyalty</p>	<h3>Customer Relationships</h3>  <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>RELATIONSHIPS: Personal assistance Self-Service Automated Services Communities Co-creation</p>	<h3>Customer Segments</h3>  <p>For whom are we creating value? Who are our most important customers?</p> <p>SEGMENTS: Individual Segment Demographic Psychographic Multi-sided Platform</p>	
<h3>Key Resources</h3>  <p>Why? Key Resources do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?</p> <p>KEY RESOURCES: Physical Financial Human Intellectual (patents, copyrights, data)</p>		<h3>Channels</h3>  <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>CHANNEL PRICES: 1. Distribution 2. Distribution 3. Distribution 4. Distribution 5. After sales 6. After sales</p>		<h3>Cost Structure</h3>  <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>KEY RESOURCES: Cost of raw materials Cost of labor Cost of production Cost of distribution Cost of customer service Cost of risk reduction Cost of accessibility Cost of customer loyalty</p>	<h3>Revenue Streams</h3>  <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: Fixed Price Usage Fee Subscription Licensing Advertising Freemium Usage Fee Subscription Licensing Advertising Freemium Usage Fee Subscription Licensing Advertising Freemium</p>

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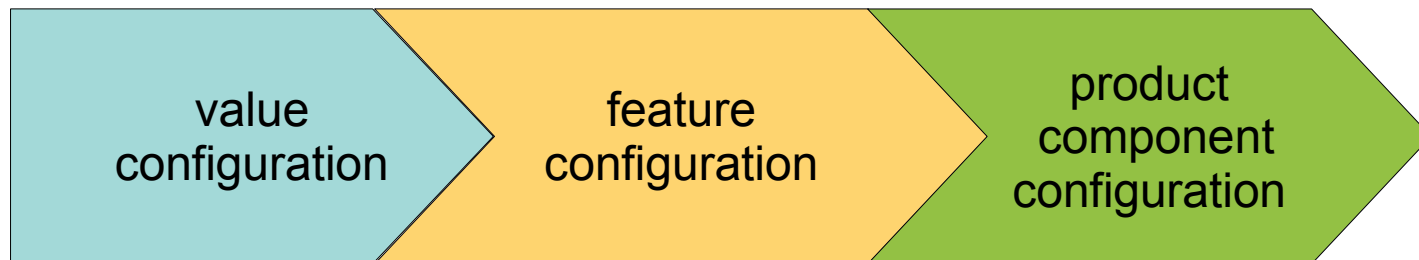
Bridging three Worlds: From Value Trees via Feature Trees to Product Component Trees

- ▶ Values can be traced via features to components of the product in the *triple bigraph* over values, features, and product components



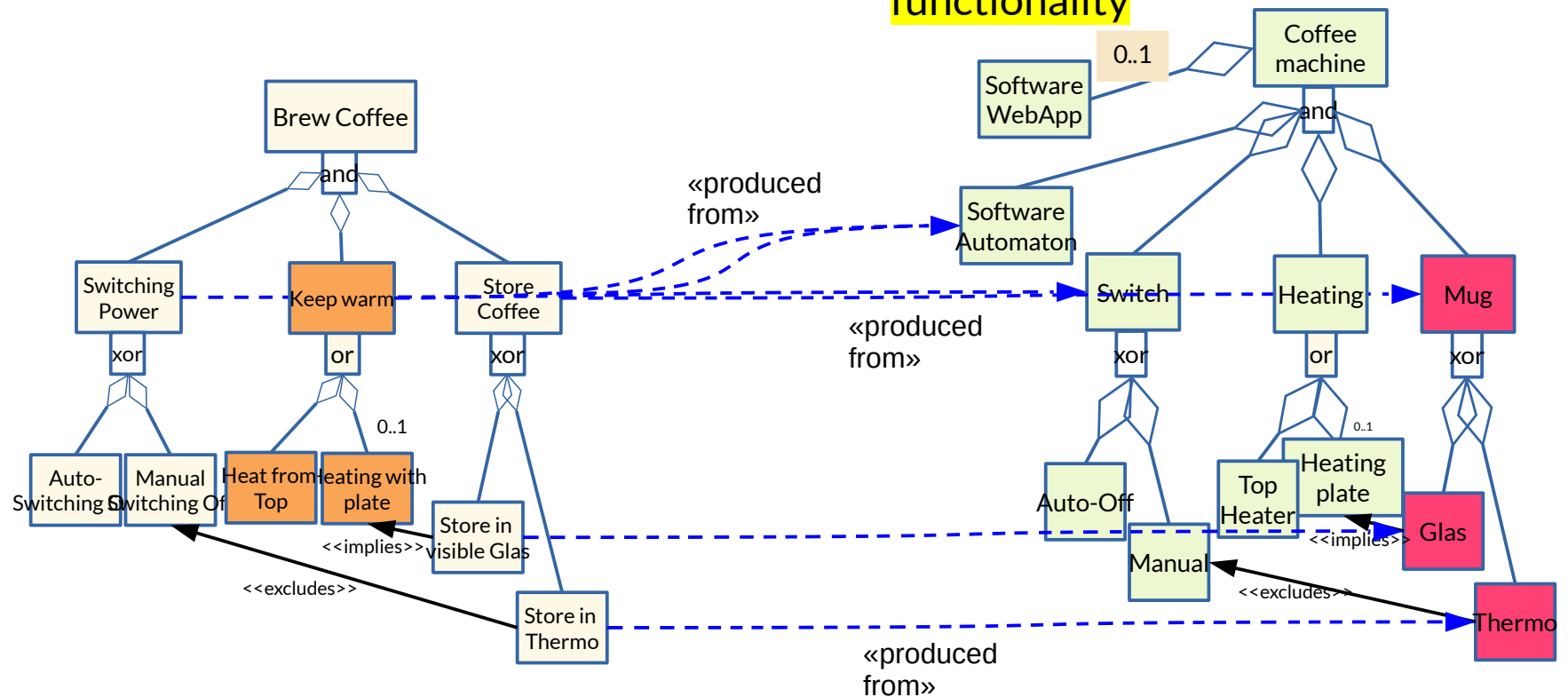
Different Classes of Configurations in the Triple Bigraph

- ▶ Value Trees, Feature Trees, Product Component Trees need to be *configured*
 - XOR configuration
 - IOR configuration
 - Optional part configuration
- ▶ **Value configuration** is the process of choosing a value
 - Features and product components are selected too (via the relations *delivered-by* and *produced-from*)
- ▶ **Feature configuration** is the process of choosing a feature
 - Product components are selected too (via the relation *produced-from*)
- ▶ **Product component configuration** is the process of choosing a product component implementation



Subtrees in Configuration

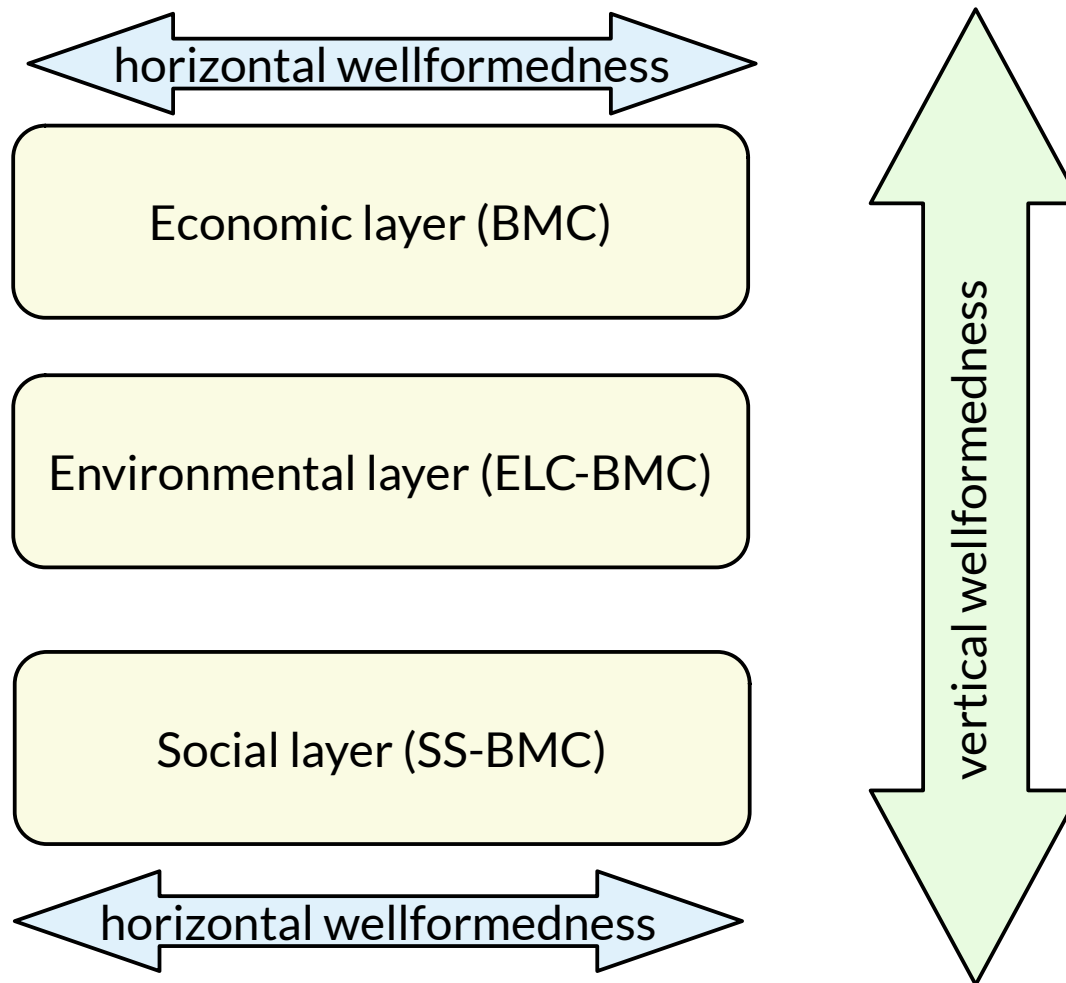
- ▶ Feature trees can be decomposed into feature subtrees
- ▶ If subtrees are left to a supplier, a supply chain results
- ▶ Definition of test suite proving feature
- ▶ Product component trees can be decomposed into component subtrees
- ▶ These subtrees can be bought from a supplier (key partner)
- ▶ Definition of functional interfaces
- ▶ Definition of tests proving subsystem functionality



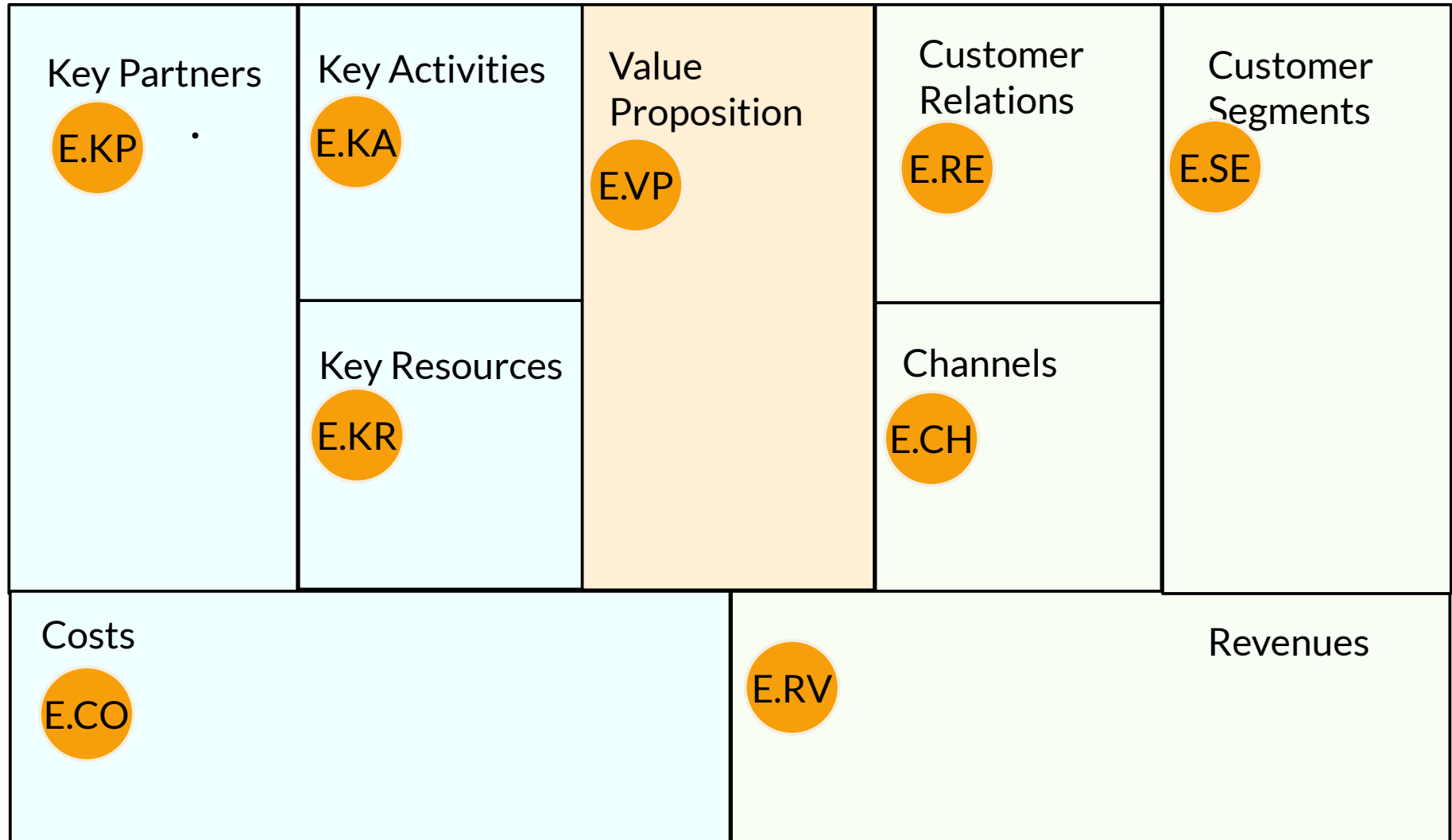
32.3 Triple Layer BMC (TLBMC) for Sustainability of Key Partners and Key Resources

The Triple Layer BMC [Joyce]

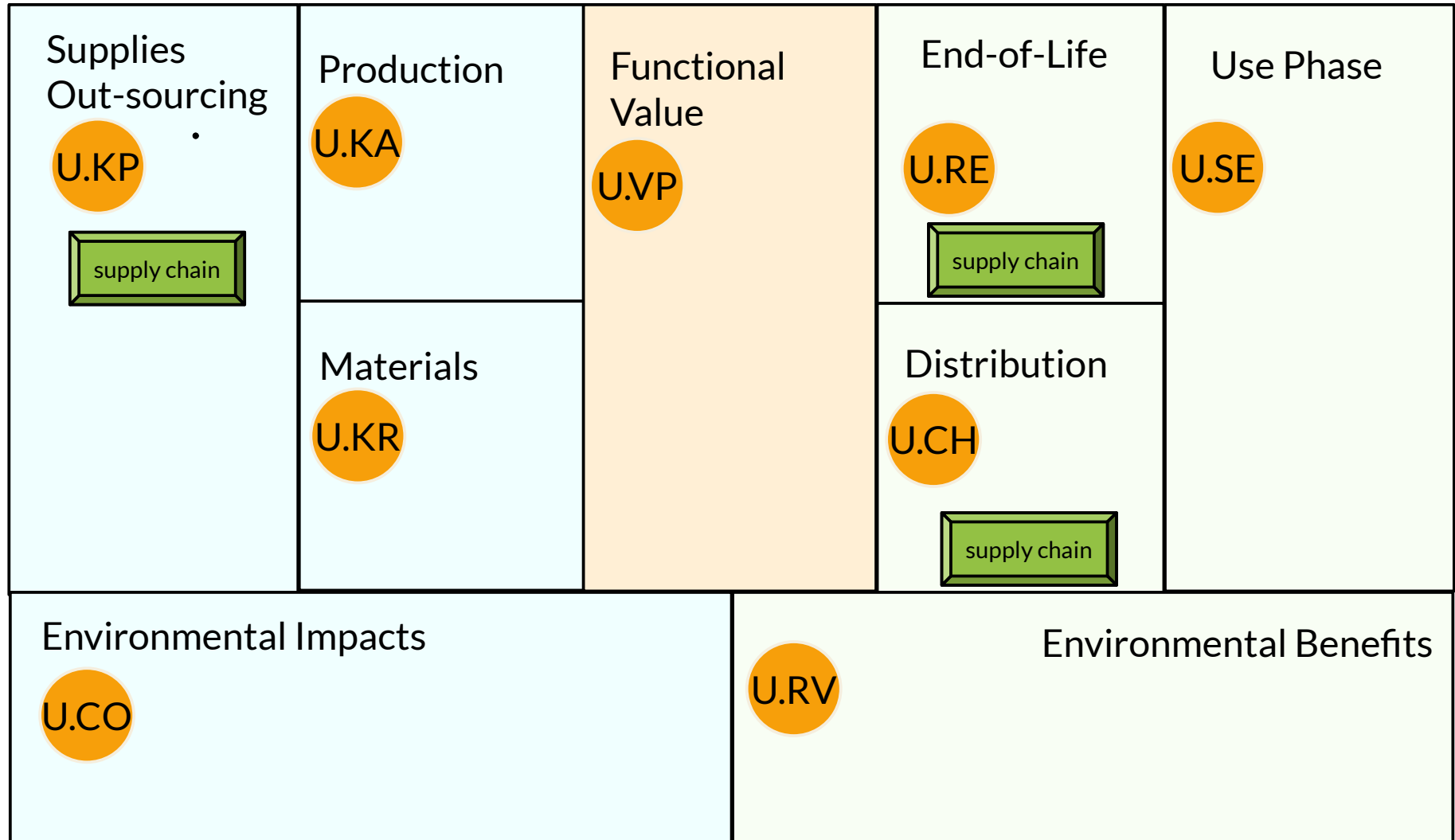
- ▶ Designing economic, sustainable and social products



BMC (economic layer)

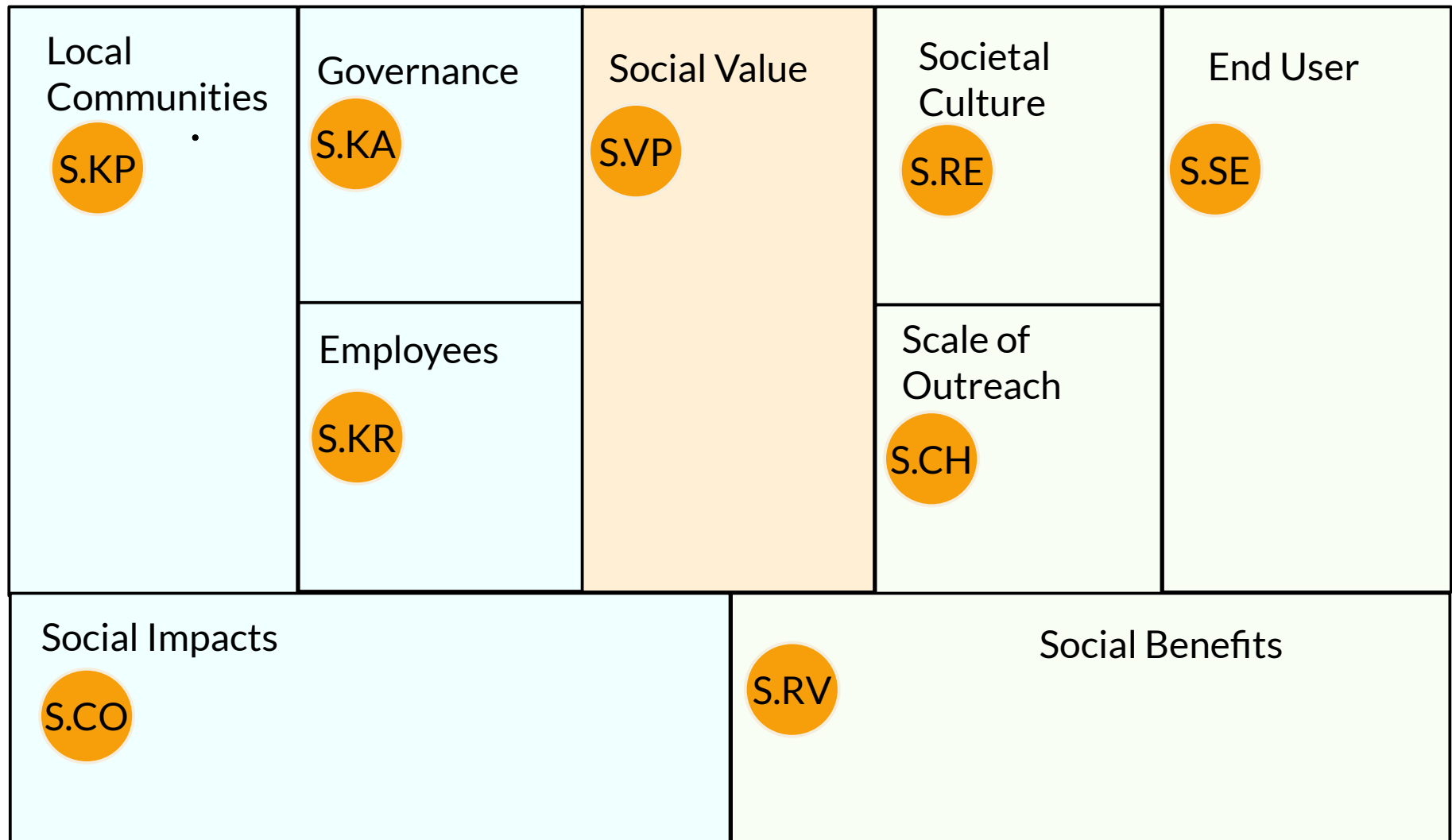


Environmental Life Cycle BMCanvas (environmental, Umwelt layer)



Social Stakeholders BMCanvas (social layer)

- ▶ What is the social value of a social business company?



Horizontal Wellformedness (Consistency)

- ▶ There is a simple consistency algorithm:
- ▶ forall field in Fields: compare E.field to U.field to S.field
- ▶ The TMBMC generates much larger value trees than the BMC.
 - How are feature trees influenced from these larger value trees?
 - Some economic values become red due to the social and environmental values.
What does this mean?
- ▶ Exercise: in the paper [Joyce], Nespresso TLBMC is discussed with aluminium capsules. Put up a new TLBC for coffee pads in filter bags (compostable), and compare the TLBMC, in particular the environmental layer.

The End

- ▶ Explain the difference of a BMC and a TLBMC. What is vertical consistency?
- ▶ How do you distribute features to your supply chain?
- ▶ Which tests do you need if you delegate a subtree of the feature model to a supplier?



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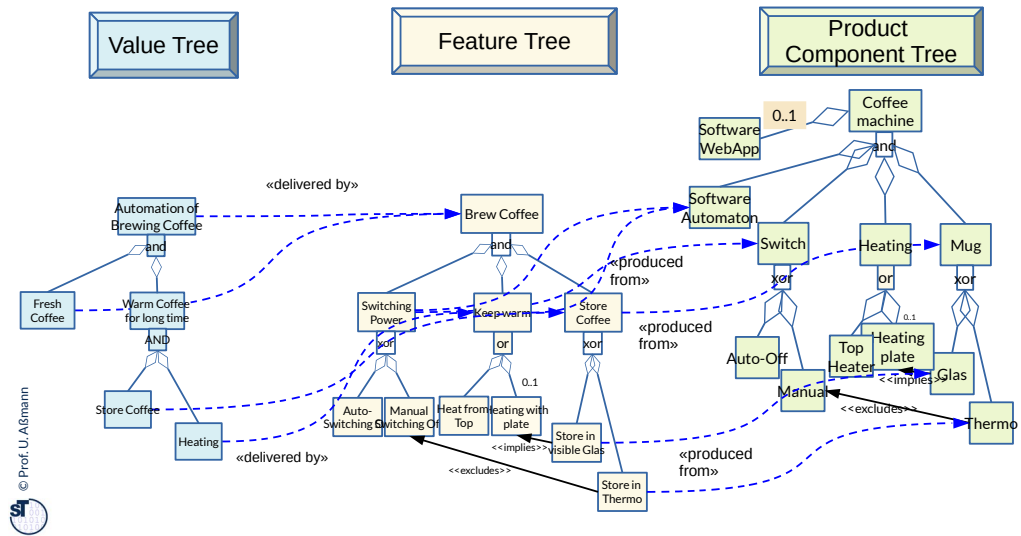
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Key Resources What resources do our Most Important require? What do we do? What do we do for our customers? What do we do for our suppliers? What do we do for our competitors? What do we do for our stakeholders?	Channels Through which channels do our Customer Segments want to be reached? How are we reaching them? What are our most important channels? How do we deliver value to our Customer Segments? How do we create value for our Customer Segments?			
Cost Structure What are the most important cost drivers of our business model? What are the most important costs? What are the most important expenses? What are the most important investments? What are the most important risks?	Revenue Streams How do we make money? What are the most important revenue streams? What are the most important revenue sources? What are the most important revenue models? What are the most important revenue strategies?			

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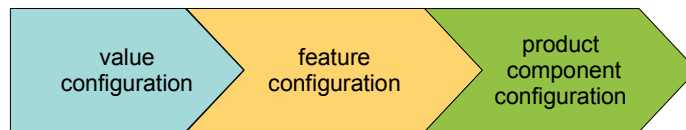
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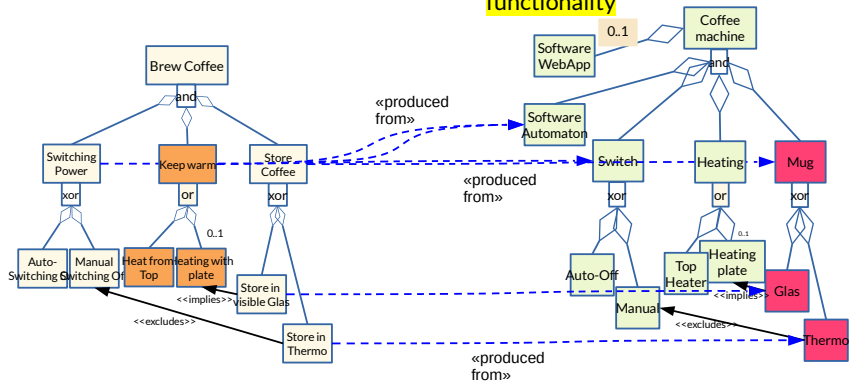
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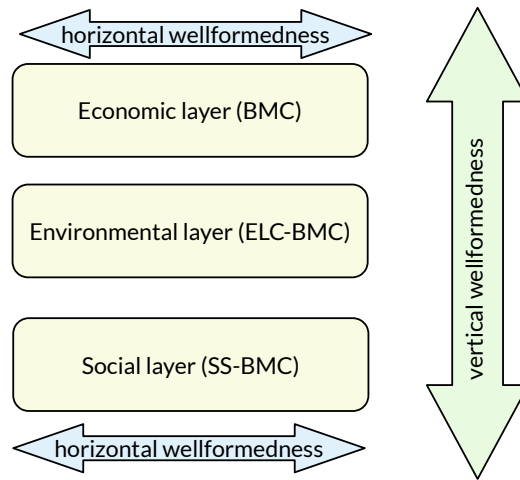




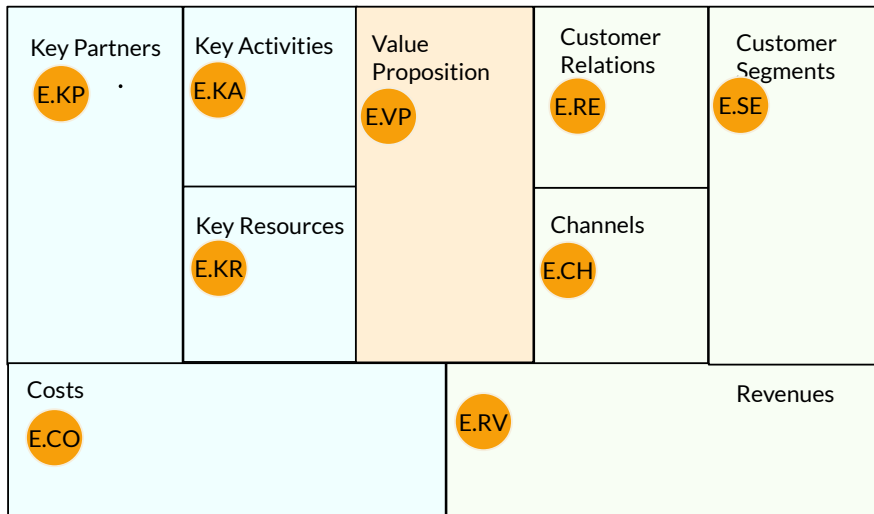
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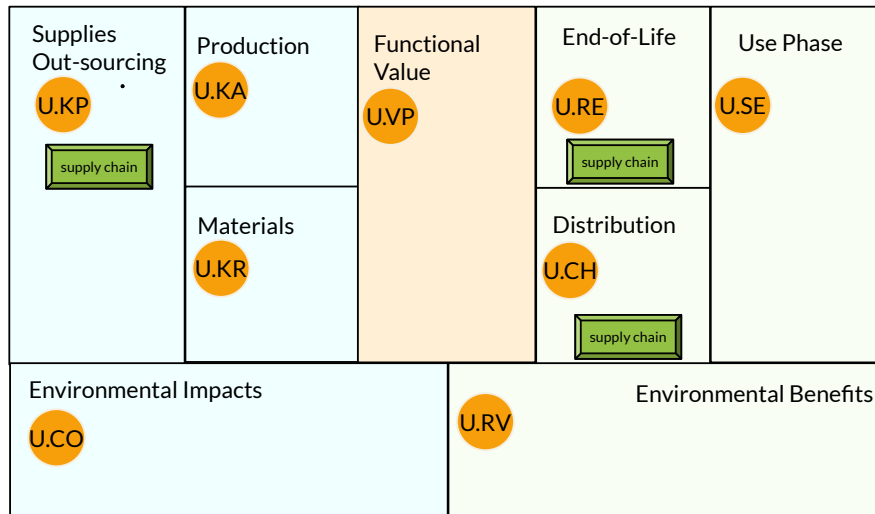
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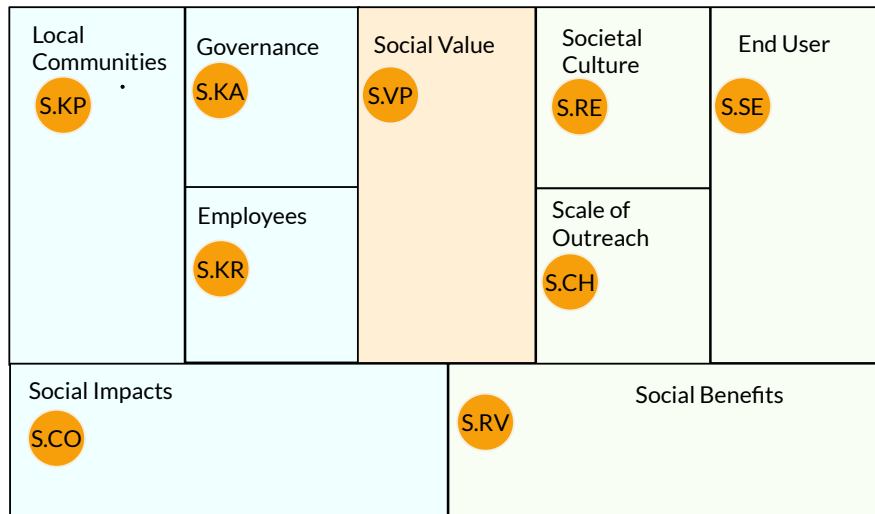


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