3 – Value Proposition
Overall benefit that the company offers the customer or itself

2 – Customer Segments
Identification and segmentation of target customers for a product or service.

1 – Development Concept
Further Development of the business model through additional solutions or optimization

4 – Revenue Streams/Value Created
Revenue generation mechanisms and/or value created for the customer

5 – Key Activities
Activities needed in order for the company to realize the value proposition

6 – Key Resources
Key Resources needed to realize the value proposition

7 – Key Partners
Key Partners needed to realize the value proposition

10 – New Business Model
New business model after the business modelling approach has been finished

9 – Cost Structure/Budget
Costs incurred during and after the implementation phase

8 – Organization
Organization needed to realize the value proposition
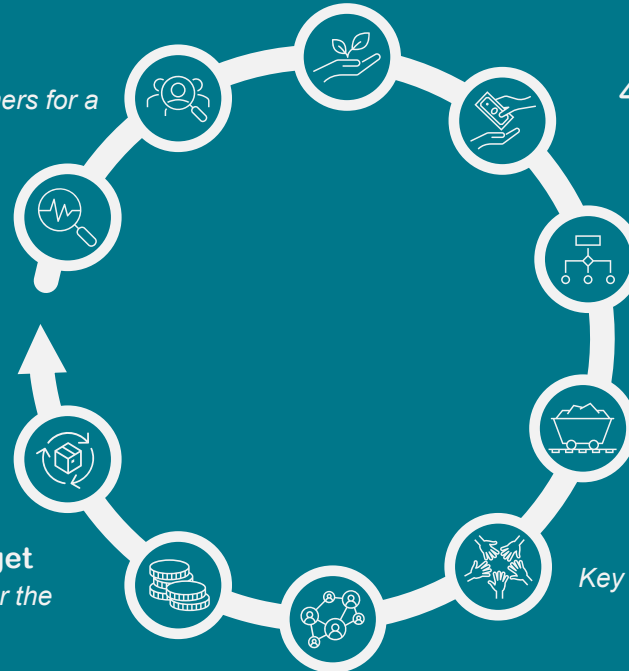
Welcome to the Digital Twin Business Modelling Approach (DTBMA)!

The DTBMA is an open access method, aiding in prioritizing use cases and formulating meaningful value propositions to support the business modelling process. Additionally, it helps identify suitable use cases and validate DT solutions from an economic standpoint. Most of the content should be clickable, so you can easily navigate through this document.

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Please be aware, that this method as well as the entire DITTID toolbox are currently under development. Therefore, this version will continuously be updated over the next months.

You have downloaded v1.0 of the Digital Twin Business Modelling Approach. Some content might be incomplete and some links might not work. If you would like to give feedback, or have any questions, feel free to contact me.

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3 – Value Proposition
Overall benefit that the company offers the customer or itself

2 – Customer Segments
Identification and segmentation of target customers for a product or service.

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Further Development of the business model through additional solutions or optimization

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New business model after the business modelling approach has been finished

9 – Cost Structure/Budget
Costs incurred during and after the implementation phase

7 – Key Partners
Key Partners needed to realize the value proposition

8 – Organization
Organization needed to realize the value proposition

Development Concept

Goal

- Identification of business model development potential through additional solutions or optimization (Use Cases)
- Clustering and Prioritization of Use Cases (UC)

Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

Cutting Edge Information on Technology, R&D, Culture, Politics

Information on current business model

Activities & Methods/Tools

BMA-A1.1 Analyze global trends

BMA-M1.1 Future Field Radar
BMA-M1.2 Trend Radar
BMA-M3.4 Expert Interview

BMA-A1.2 Evaluate current business model

BMA-M1.3 SWOT Analysis
BMA-M1.4 Benchmarking

BMA-A1.3 Identify new potential Use Cases

BMA-M1.5 Brainstorming
BMA-M1.6 Use Case Catalogue

Link PM: **PM-A1.3**

BMA-A1.4 Categorize and evaluate Use Cases

BMA-M1.7 Benefit-Effort-Matrix
BMA-M1.8 Categorization & Clustering

Link PM: **PM-A1.3**

BMA-A1.5 Assess Digital-Twin-Readiness

BMA-M1.9 Digital Twin-Readiness Frameworks

Link PM: **PM-A2.4**

BMA-A1.6 Cluster and prioritize Use Cases

BMA-M1.10 Netgraph Clustering
BMA-M1.11 Pairwise Comparison & Weighted Scoring Analysis
BMA-M1.12 Shell Model

Link PM: **PM-A1.3**

Output

BMA-D1.1 Prioritized Use Cases and Clusters

Key Questions General

- How does the company grow in the existing business model? (**BMA-A1.2**)
- How can global trends/innovative technologies be applied to the business model? (**BMA-A1.1**, **BMA-A1.3**)
- Which use cases align best with the current business model? (**BMA-A1.4**, **BMA-A1.6**)

Key Questions Digital Twin/Data

- How ready is the organization for the Digital Twin? (**BMA-A1.5**)
- What is the Digital Twin-readiness concerning the data/information flow in the process and the used technologies in the IT ecosystem? (**BMA-A1.5**)
- Are there additional digital solutions that could enhance the current product/system? (**BMA-A1.1, BMA-A1.2, BMA-A1.3**)

Customer Segments

Goal

- Identification of group of people or organizations as target customers for a product or service (Use Case)
- External or Internal Use Case
- Background information on potential customers
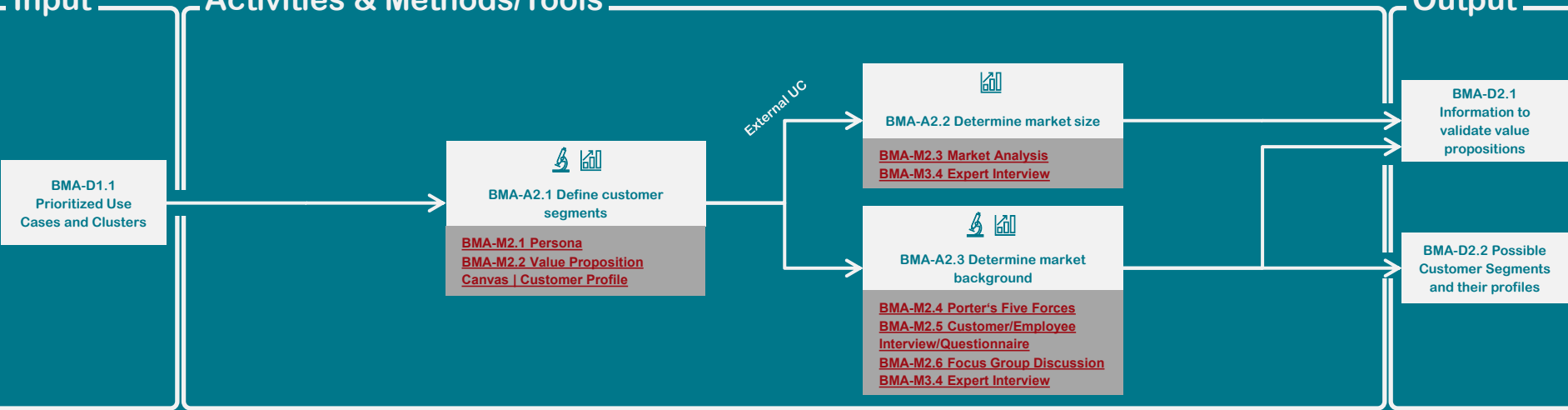
Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D1.1 Prioritized Use Cases and Clusters

Activities & Methods/Tools

BMA-A2.1 Define customer segments

BMA-M2.1 Persona
BMA-M2.2 Value Proposition Canvas | Customer Profile

External UC

BMA-A2.2 Determine market size

BMA-M2.3 Market Analysis
BMA-M3.4 Expert Interview

BMA-A2.3 Determine market background

BMA-M2.4 Porter's Five Forces
BMA-M2.5 Customer/Employee Interview/Questionnaire
BMA-M2.6 Focus Group Discussion
BMA-M3.4 Expert Interview

Output

BMA-D2.1 Information to validate value propositions

BMA-D2.2 Possible Customer Segments and their profiles

Key Questions General

- For whom do we create value? [Osterwalder, 2014] | Are they internal or external customers? (BMA-A2.1)
- How do we describe and differentiate our target customers? [Nagl, 2018] (BMA-A2.1)
- Is the market growing? If yes, in which direction? [Nagl, 2018] (BMA-A2.2)
- Does the service/product offering run the risk of cannibalizing existing customer relationships? [Nagl, 2018] (BMA-A2.3)

Key Questions Digital Twin/Data

- Which customer might find which data interesting? (BMA-A2.1)
- Which customer is ready for the Digital Twin topic? (BMA-A2.1, BMA-A2.3)
- Which customers could be champions in Digital Twin/Data? (BMA-A2.1)

Value Proposition

Goal

- Validated value proposition for each customer

Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D2.1 Information to validate value propositions

BMA-D2.2 Possible Customer Segments and their profiles

Activities & Methods/Tools

BMA-A3.1 Propose the values to be offered to each customer

BMA-M3.1 Value Proposition Canvas | Value Map & Fit

BMA-A3.2 Compare solution to competition

BMA-M3.2 Perceptual Map

BMA-A3.3 Determine the market needs

BMA-M2.5 Customer/Employee Interview
BMA-M2.6 Focus Group Discussion (FGD)

BMA-A3.4 Validate the value proposition

BMA-M3.3 Validation Board
BMA-M3.4 Expert Interview

Output

BMA-D3.1 Validated value proposition

Key Questions General

- ☐ Which customer needs do we meet? [Osterwalder, 2011] (BMA-A3.1, BMA-A3.3)
- ☐ Which problems of our customers do we help to solve [Osterwalder, 2011] (BMA-A3.1)
- ☐ Have we validated the value proposition? (BMA-A3.4)
- ☐ What alternatives does the customer have? Are we building more valuable customer value? [Maurya, 2012] (BMA-A3.2)

Key Questions Digital Twin/Data

- ☐ What additional value can be generated for customers with the data/Digital Twin? (BMA-A3.1)
- ☐ Which data has the potential to generate added value for your own company? (BMA-A3.1)
- ☐ What is the added value generated by the use of data? (BMA-A3.1)

Goal

- External Use Case: Identified mechanisms how to generate revenue from the new use case
- Internal Use Case: Identified mechanisms how to create value from the new use case

Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D3.1 Validated value proposition

BMA-D2.2 Possible Customer Segments and their profiles

Activities & Methods/Tools

BMA-A4.1 Determine the values to be offered for which the customer would be most willing to pay

BMA-M4.1 Kano-Model

BMA-A4.2 Determine the benefits for each customer

BMA-M1.6 Use Case Collection
BMA-M4.2 Magic Triangle

BMA-A4.3 Quantify the benefits in monetary terms

BMA-M4.3 Financial Benefit Analysis
BMA-M4.4 OEE-Analysis

External UC

BMA-A4.4 Determine how revenue is generated from customers

BMA-M1.4 Benchmarking

Output

BMA-D4.1 Product to be offered to each segment

**BMA-D4.2 Understand the way how to generate revenue from each customer segment**

BMA-D4.3 Expected revenue or value created

Key Questions General

- ☐ Which value is offered to which customer? (BMA-A4.1, BMA-A4.2)
- ☐ How will the revenue be generated? (BMA-A4.4)
- ☐ What are the possible sales scenarios? (Best-Case, Most-Likely, Worst-Case) [Nagl, 2018] (BMA-A4.4)
- ☐ What pricing is assumed for the products/services? [Nagl, 2018] (BMA-A4.4)

Key Questions Digital Twin/Data

- ☐ How strong is the added value of the potential data use for the customer? (BMA-A4.2, BMA-A4.3)
- ☐ How much does the customer save or increase her/his revenue by using Digital Twin? (BMA-A4.3)
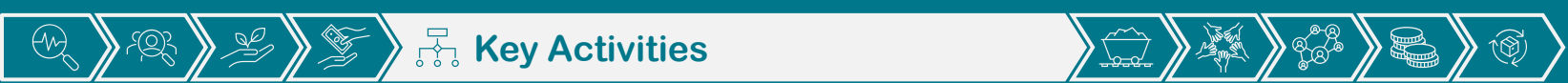
Key Activities

Goal
- Identify the activities needed in order to realize the value proposition
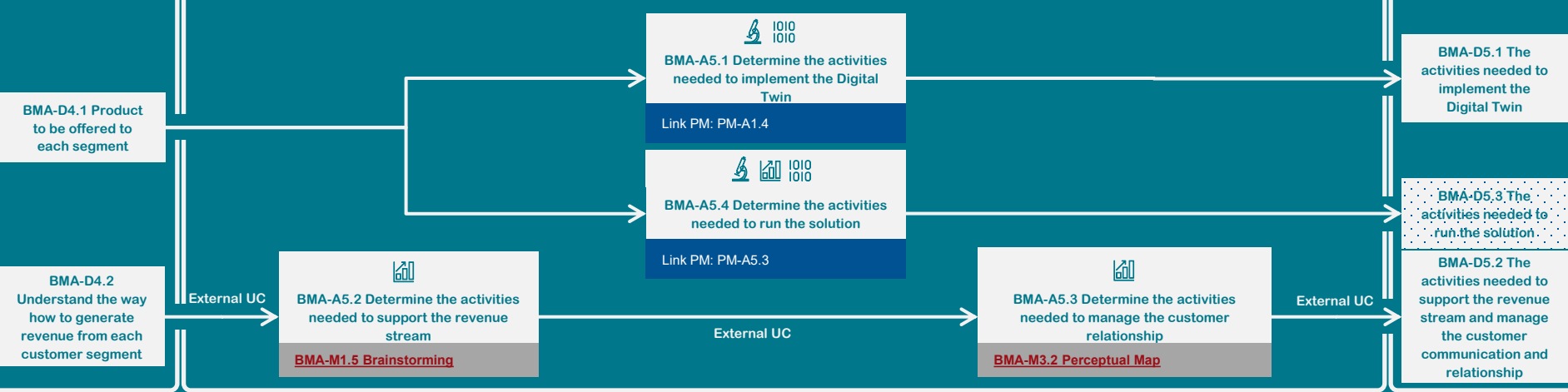
Departments
- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D4.1 Product to be offered to each segment

BMA-D4.2 Understand the way how to generate revenue from each customer segment

Activities & Methods/Tools

BMA-A5.1 Determine the activities needed to implement the Digital Twin

Link PM: PM-A1.4

BMA-A5.4 Determine the activities needed to run the solution

Link PM: PM-A5.3

BMA-A5.2 Determine the activities needed to support the revenue stream

BMA-M1.5 Brainstorming

External UC

BMA-A5.3 Determine the activities needed to manage the customer relationship

BMA-M3.2 Perceptual Map

External UC

External UC

Output

BMA-D5.1 The activities needed to implement the Digital Twin

BMA-D5.3 The activities needed to run the solution

BMA-D5.2 The activities needed to support the revenue stream and manage the customer communication and relationship

Key Questions General
- Which Key Activities do our value propositions require? (implementing and running the Digital Twin) [Osterwalder, 2011] (BMA-A5.1, BMA-A5.4)
- Which Key Activities are needed to generate and maintain the revenue stream? [Osterwalder, 2020] (BMA-A5.2)
- Which channels do our customers expect us to use for communication and value delivery? [Jodlbauer, 2020] (BMA-A5.3)

Key Questions Digital Twin/Data
- How do I get customers to share their data? (BMA-A5.1, BMA-A5.2)
- How will the data processing be handled? (BMA-A5.1, BMA-A5.2)
- What are the main steps to go through to analyze and evaluate the data? (BMA-A5.1, BMA-A5.2)

Key Resources

Goal

- Identified the key resources needed to realize the value proposition

Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D5.1 The activities needed to implement the Digital Twin

BMA-D5.2 The activities needed to support the revenue stream and manage the customer communication and relationship

BMA-D5.3 The activities needed to run the solution

Activities & Methods/Tools

BMA-A6.1 Determine the resources needed to realize the Use Case

BMA-M6.1 Resource Requirement Plan

Link PM: PM-A1.5

BMA-A6.2 Determine the activities & resources to be provided by the company

BMA-M6.2 Resource Inventory

Link PM: PM-A1.5

Output

BMA-D6.1 The resources needed to realize the Use Case

BMA-D6.2 The activities & resources that can be covered internally

Key Questions General

- What key resources do our key activities require? [Jodlbauer, 2020] (BMA-A6.1)
- Do we need to acquire more knowledge? If yes, which? (BMA-A6.1)
- Which key resources do we provide ourselves? [Jodlbauer, 2020] (BMA-A6.2)

Key Questions Digital Twin/Data

- What data do I need and where do I get this data from? (BMA-A6.1, BMA-A6.2)
- What IT infrastructure do I need to implement the Digital Twin? [Nagl, 2018] (BMA-A6.1)
- What data do I need from the customer? (BMA-A6.1)

Key Partners

Goal
- Identified the key partners needed to realize the value proposition
- Identified stakeholders and their influence in the project process

Departments
- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input
BMA-D6.1 The resources needed to realize the Use Case

BMA-D6.2 The activities & resources that can be covered internally

Activities & Methods/Tools

BMA-A7.1 Determine the resources to be provided by the partners
- BMA-M1.5 Brainstorming

BMA-A7.2 Determine the required partners to provide the resources
- BMA-M1.5 Brainstorming
- Link PM: PM-A2.6

BMA-A7.3 Identify the relevant stakeholders
- BMA-M1.5 Brainstorming
- BMA-M7.1 Stakeholder Map

BMA-A7.4 Differentiate between stakeholders and categorize them
- BMA-M7.2 Power-Interest-Attitude-Matrix

BMA-A7.5 Investigate relationships between stakeholders
- BMA-M7.3 Actor-Linkage-Matrix
- BMA-M7.4 Knowledge Mapping
- BMA-M7.5 RACI-Mapping

Output
BMA-D7.1 All Key Partners identified to provide the resources not covered internally

BMA-D7.2 Stakeholder organization structure with the most positive impact

Key Questions General
- Which key partners are needed for which activities/resources? [Nagl, 2018; Osterwalder, 2010] (BMA-A7.1, BMA-A7.2)
- Do we have existing key partners, who could provide the needed resources and activities? [Nagl, 2018] (BMA-A7.2)
- Which stakeholders have a strong influence in this project and need to be managed? (BMA-A7.3, BMA-A7.4, BMA-A7.5)

Key Questions Digital Twin/Data
- Which partner can process the customer's data (and generate added value from it)? (BMA-A7.2)
- Which stakeholders have an interest in how the data is used? (BMA-A7.3, BMA-A7.4)

Organization

Goal
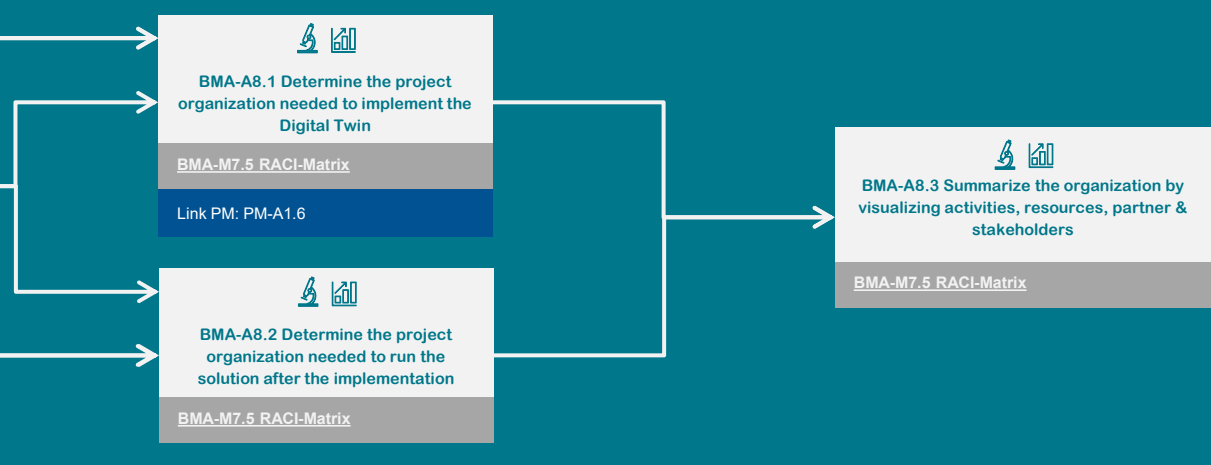- Determined how the company will organize the work to be done

Departments
- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input
- **PM-D1.4 Implementation Plan**
- **BMA-D6.1 The resources needed to realize the Use Case**
- **BMA-D5.1, BMA-D5.2, BMA-D5.3 Key Activities**
- **BMA-D7.1 All Key Partners identified to provide the resources not covered internally**
- **BMA-D7.2 Stakeholder organization structure with the most positive impact**

Activities & Methods/Tools

BMA-A8.1 Determine the project organization needed to implement the Digital Twin

BMA-M7.5 RACI-Matrix

Link PM: PM-A1.6

BMA-A8.2 Determine the project organization needed to run the solution after the implementation

BMA-M7.5 RACI-Matrix

BMA-A8.3 Summarize the organization by visualizing activities, resources, partner & stakeholders

BMA-M7.5 RACI-Matrix

Output
BMA-D8.1 Overview of Project Organization

Key Questions General
- How are tasks distributed? (BMA-A8.3)
- Who is responsible for which task? (BMA-A8.1, BMA-A8.2)
- Who is accountable for which task? (BMA-A8.1, BMA-A8.2)

Key Questions Digital Twin/Data
- Who takes care of which data and the data connection? (BMA-A8.1, BMA-A8.2)

Goal

- Determined the cost structure and budget needed to realize the Use Case

Departments

- Management
- Production
- Business Development
- Research & Development
- Finance & Controlling
- IT
- Supply Chain & Logistics

Summary

Input

BMA-D5.1, BMA-D5.2, BMA-D5.3 Key Activities

BMA-D8.1 Overview of Project Organization

BMA-D7.1 All Key Partners identified

BMA-D6.1 The resources needed to realize the Use Case

BMA-D4.3 Expected revenue or value created

Activities & Methods/Tools

BMA-A9.1 Determine the additional costs during the implementation phase

BMA-M9.1 Cost-Breakdown-Analysis

BMA-A9.2 Determine the additional costs to uphold the Digital Twin after the implementation

BMA-M9.1 Cost-Breakdown-Analysis

BMA-A9.3 Compare cost to value created/revenue streams

BMA-M9.2 Break-Even-Analysis

Output

BMA-D9.1 Comparison of cost to value created/revenue streams

BMA-D9.2 Total Cost determined to implement and maintain Digital Twin

Key Questions General

- Which activities, resources and partnerships create costs and by what driver are these created? [Jodlbauer, 2020; Nagl, 2018] (BMA-A9.1, BMA-A9.2)
- Are all costs incurred defined? [Nagl, 2018] (BMA-A9.1, BMA-A9.2)
- When is the Break-Even-Point reached? (BMA-A9.3)

Key Questions Digital Twin/Data

- How much does it cost to acquire/generate and process the data? (BMA-A9.1, BMA-A9.2)
- How much does it cost to analyze and evaluate the data? (BMA-A9.1, BMA-A9.2)
- How much does it cost to provide the data to the customer? (BMA-A9.1, BMA-A9.2)

New Business Model

Business Modelling Canvas

Key Partners

BMA-D7.1 All Key Partners identified to provide the resources not covered internally

Buy-In / Support

BMA-D7.2 Stakeholder organization structure with the most positive impact

Key Activities

BMA-D5.1 The activities needed to implement the Digital Twin

BMA-D5.3 The activities needed to run the solution

BMA-D8.1 Overview of Project Organization

Key Resources

BMA-D6.1 The resources needed to realize the Use Case

Data Resources

BMA-D6.1 The resources needed to realize the Use Case

Value Propositions

BMA-D3.1 Validated value proposition

Customer Relationships

BMA-D5.2 The activities needed to support the revenue stream and manage the customer communication and relationship

Channels

BMA-D5.2 The activities needed to support the revenue stream and manage the customer communication and relationship

Data Insights

BMA-D4.1 Product to be offered to each segment

Customer Segments

BMA-D2.2 Possible Customer Segments and their profiles

Cost Structure / Budget

BMA-D9.2 Total Cost determined to implement and maintain Digital Twin

Revenue Streams

BMA-D4.3 Expected revenue or value created

Activity – How can the goal be reached?

Index
BMA – A1.1

Title
Analyze Global Trends

Type of Use Case
Internal | External

Overall Objective
BMA – D1.1

Link to the Business Modelling Approach

Development Concept

Procedure

1. Analysis of global trends

2. Filtering of global trends that could fit the company

3. Identification of potentials in global trends that the company can incorporate into the business model

Methods & Tools

BMA – M1.1 Future Field Radar

BMA – M1.2 Trend Radar

BMA – M3.4 Expert Interview

Activity – How can the goal be reached?

Index
BMA – A1.2

Title
Evaluate current business model

Type of Use Case
Internal | External

Overall Objective
BMA – D1.1

Link to the Business Modelling Approach

Development Concept

Procedure

1. Compare your business model to traditional types of business models

2. Compare your sales model to innovative sales models

3. Examine industry reports for leading company in your industry

4. Compare gross profit margin results for different companies

5. Identify Strengths & Weaknesses of your business model

Methods & Tools

BMA – M1.3 SWOT Analysis

BMA – M1.4 Benchmarking

Activity – How can the goal be reached?

Index
BMA – A1.3

Title
Identify new potential use cases

Type of Use Case
Internal   **External**

Overall Objective
BMA – D1.1

Link to the Business Modelling Approach

Development Concept

Procedure

1. Organize a workshop with the relevant stakeholders

2. Collect as many use cases as possible using different creativity methods.

3. Cf. DT procedure model for more detailed information

Methods & Tools

BMA – M1.5 Brainstorming

BMA – M1.6 Use Case Catalogue

PM – A1.3 Create pre-selection of rough use cases

Activity – How can the goal be reached?

Index
BMA – A1.4

Title
Categorize and evaluate Use Cases

Link to the Business Modelling Approach

Development Concept

Type of Use Case
Internal | External

Overall Objective
BMA – D1.1

Procedure

1. Consolidate and categorize use cases

2. Evaluate use cases

Methods & Tools

BMA – M1.8 Benefit-Effort Portfolio

BMA – M1.8 Categorization & Clustering

PM – A1.3 Create pre-selection of rough use cases

Activity – How can the goal be reached?

Index
BMA – A1.5

Title
Assess Digital-Twin-Readiness

Type of Use Case
Internal | External

Overall Objective
BMA – D1.1

Link to the Business Modelling Approach

Development Concept

Procedure

1. Assessment of the data structure and IT landscape → Derivation of strengths and weaknesses.

2. Determination of the technology maturity level and process maturity level → Derivation of strategies for achieving a better maturity level

3. Determination of potentials and barriers to the introduction of DT

Methods & Tools

BMA – M1.9 Digital Twin Readiness Framework

PM – A1.3 Create pre-selection of rough use cases

Activity – How can the goal be reached?

Index
BMA – A1.6

Title
Cluster and prioritize use cases

Type of Use Case
Internal | External

Overall Objective
BMA – D1.1

Link to the Business Modelling Approach

Development Concept

Procedure

1. Make interrelationships of use cases visible

2. Clustering of use cases and selection of a cluster

3. Detailing and evaluation of the use cases in the cluster

4. Prioritization

Methods & Tools

BMA – M1.10 Netgraph Clustering

BMA – M1.11 Pairwise Comparison & Weighted Scoring Analysis

BMA – M1.12 Shell Model

PM – A1.3 Create pre-selection of rough use cases

Activity – How can the goal be reached?

Index
BMA – A2.1

Title
Define customer segments

Type of Use Case
Internal | External

Overall Objective
BMA – D2.1

Link to the Business Modelling Approach

Customer Segments

Procedure

1. Collect data about your (potential) customers and integrate it from various sources OR generate assumptions about your (potential) customers

2. Identify common traits, characteristics or activities of your customers

3. Create Persona based on customers that share common traits

Methods & Tools

BMA – M2.1 Persona

BMA – M2.2 Value Proposition Canvas | Customer Profile

Osterwalder

Activity – How can the goal be reached?

Index
BMA – A2.2

Title
Determine market size

Link to the Business Modelling Approach

Customer Segments

Type of Use Case
Internal | External

Overall Objective
BMA – D2.1 | BMA – D2.2

Procedure

1. Define the group target customers

2. Estimate the number of actual customers

3. Determine your penetration rate

4. Calculate the potential market size: Volume and value

Methods & Tools

BMA – M2.3 Market Analysis

BMA – M3.4 Expert Interview

Activity – How can the goal be reached?

Index
BMA – A2.3

Title
Define market background

Type of Use Case
Internal | External

Overall Objective
BMA – D2.1 | BMA – D2.2

Link to the Business Modelling Approach

Customer Segments

Procedure

1. Analyze industry backgrounds of your market

2. Determine which parts of the industry are targeted by the focal Use Cases

Methods & Tools

BMA – M2.4 Porter's Five Forces

BMA – M2.5 Customer/Employee Interview/Questionnaire

BMA – M2.6 Focus Group Discussion

BMA – M3.4 Expert Interview

Activity – How can the goal be reached?

Index
BMA – A3.1

Title
Propose the values to be offered to each customer

Type of Use Case
Internal | External

Overall Objective
BMA – D3.1

Link to the Business Modelling Approach

Value Proposition

Procedure

1. Assign the value propositions to the corresponding customers

2. Assume which value propositions have a higher priority for the customer

Methods & Tools

BMA – M3.1 Value Proposition
Canvas | Value Map & Fit

Activity – How can the goal be reached?

Index
BMA – A3.2

Title
Compare solution to competition

Type of Use Case
Internal   External

Overall Objective
BMA – D3.1

Link to the Business Modelling Approach
Value Proposition

Procedure
1. Compare your value proposition to the current value proposition of competitors

2. Include different dimensions e.g. price, features into the comparison

Methods & Tools
BMA – M3.2 Perceptual Map

Activity – How can the goal be reached?

Index
BMA – A3.3

Title
Determine market needs

Type of Use Case
Internal | External

Overall Objective
BMA – D3.1

Link to the Business Modelling Approach

Value Proposition

Procedure

1. Analyze, which needs the (potential) market has

2. Determine, which needs are most pressing and urgent

3. Prioritize, which needs to address with the value proposition

Methods & Tools

BMA – M2.5 Customer/Employee Interview/Questionnaire

BMA – M2.6 Focus Group Discussion

Activity – How can the goal be reached?

Index
BMA – A3.4

Title
Validate value proposition

Type of Use Case
Internal | External

Overall Objective
BMA – D3.1

Link to the Business Modelling Approach

Value Proposition

Procedure

Validate the value proposition by doing one or more of the following:

- **Product analytics:** How do customers use the features you deem most valuable?

- **Usability studies:** Currently, What do customers expect and get out of a comparable product?

- **Customer interviews:** Conduct customer interviews about customer needs and analyse their reaction to the value proposition.

- **Competitive intelligence:** How is your product different from the competitors' products?

- **Internal employee surveys and interviews:** What insights do your customer-facing teams – customer support, sales, and research – have about customer needs and what ways of positioning the product worked best for them?

Methods & Tools

BMA – M3.3 Validation Board

BMA – M3.4 Expert Interview

[Osterwalder, Pigneur et al., 2014, pp. 43-64]

Activity – How can the goal be reached?

Index
BMA – A4.1

Title
Determine values for which the customer would be most willing to pay

Type of Use Case
Internal

External

Overall Objective
BMA – D4.1

BMA – D4.2

BMA – D4.3

Link to the Business Modelling Approach

Revenue Streams/Value Created

Procedure
1. Use the information gained from the validation of the value proposition to reassign the values to each customer segment

2. Take into consideration the priority of values for each customer.

Methods & Tools
BMA – M4.1 Kano-Model

Activity – How can the goal be reached?

Index
BMA – A4.2

Title
Determine the benefits for each customer

Type of Use Case
Internal | External

Overall Objective
BMA – D4.1 | BMA – D4.2 | BMA – D4.3

Link to the Business Modelling Approach

Revenue Streams/Value Created

Procedure

1. Transform the value proposition into benefits for the customer

2. Categorize and evaluate these benefits

Methods & Tools

BMA – M1.6 Use Case Collection

BMA – M4.2 Magic Triangle

Activity – How can the goal be reached?

Index
BMA – A4.3

Title
Quantify the benefits in monetary terms

Link to the Business Modelling Approach

Revenue Streams/Value Created

Type of Use Case
Internal | External

Overall Objective
BMA – D4.2 | BMA – D4.3

Procedure
Use number-based tools and methods to quantify the benefits for the customer in monetary terms

Methods & Tools
BMA – M4.3 Financial Benefit Analysis

BMA – M4.4 Overall Equipment Efficiency

Activity – How can the goal be reached?

Index
BMA – A4.4

Title
Determine how revenue is generated from customers

Type of Use Case
Internal | External

Overall Objective
BMA – D4.2 | BMA – D4.3

Link to the Business Modelling Approach

Revenue Streams/Value Created

Procedure

1. Determine how the transaction/payment from the customer segments will look like
   1. Payment model (e.g. one-time, recurring, data-based)
   2. Direct Sales or indirect Sales through Partner
   3. Customer pays or somebody else

2. Determine for which exact product the customer segments will pay (Pricing)

3. Identify ways to scale the revenue

Methods & Tools

BMA – M1.4 Benchmarking

Activity – How can the goal be reached?

Index
BMA – A5.1

Title
Determine the activities needed to implement the Digital Twin

Type of Use Case
Internal | External

Overall Objective
BMA – D5.1

Link to the Business Modelling Approach
Key Activities

Procedure
1. Determine the technical activities needed to implement the Digital Twin

2. Determine the organizational and business activities needed to implement the Digital Twin

Methods & Tools
PM – A1.4 Planning of the project (procedure & activities)

Activity – How can the goal be reached?

Index
BMA – A5.2

Title
Determine the activities needed to support the revenue stream

Link to the Business Modelling Approach

Key Activities

Type of Use Case
Internal | External

Overall Objective
BMA – D5.2

Procedure

1. Determine the channels through which the value proposition is communicated to the customer:
   - Value communication
   - Value delivery

2. Determine the organizational and business activities needed to support the revenue stream

Methods & Tools
BMA – M1.5 Brainstorming

Activity – How can the goal be reached?

Index
BMA – A5.3

Title
Determine the activities needed to manage the customer relationship

Type of Use Case
Internal | External

Overall Objective
BMA – D5.2

Link to the Business Modelling Approach
Key Activities

Procedure

1. Determine the activities through which the customer relationship is established

2. Determine the activities through which the customer relationship is maintained

3. Determine the activities through which the customer relationship can be improved and extended

Methods & Tools
BMA – M3.2 Perceptual Map

Activity – How can the goal be reached?

Index
BMA – A5.4

Title
Determine the activities needed to run the solution

Type of Use Case
Internal | External

Overall Objective
BMA – D5.3

Link to the Business Modelling Approach

Key Activities

Procedure

1. Determine the technical activities needed to run the solution after the implementation phase

2. Determine the organizational and business activities needed to run the solution after the implementation phase

Methods & Tools

PM – A1.4 Planning of the project (procedure & activities)

Activity – How can the goal be reached?

Index
BMA – A6.1

Title
Determine the resources needed to realize the Use Case

Type of Use Case
Internal | External

Overall Objective
BMA – D6.1 | BMA – D6.2

Link to the Business Modelling Approach

Key Ressources

Procedure

1. Determine which resources are needed to realize the Use Case (people and equipment)

2. Determine at which points in time these resources are needed

Methods & Tools

BMA – M6.1 Resource Requirement Plan

PM – A1.5 Create a resource plan

Activity – How can the goal be reached?

Index
BMA – A6.2

Title
Determine the activities & resources to be provided by the company

Type of Use Case
Internal | External

Overall Objective
BMA – D6.1 | BMA – D6.2

Link to the Business Modelling Approach

Key Ressources

Procedure

1. Analyze, which resources are currently available in the company

2. Determine where there is a need for additional resources

Methods & Tools

BMA – M6.2 Resource Inventory

PM – A1.5 Create a resource plan

Activity – How can the goal be reached?

Index
BMA – A7.1

Title
Determine the resources to be provided by the partners

Type of Use Case
Internal | External

Overall Objective
BMA – D7.1

Link to the Business Modelling Approach

Key Partners

Procedure

1. Assess whether resources can be provided by partners

2. Assess how beneficial outsourcing to partners can be for specific resources

3. Determine which resources are to be provided by partners

Methods & Tools

BMA – M1.5 Brainstorming

Activity – How can the goal be reached?

Index
BMA – A7.2

Title
Determine the required partners to provide the resources

Type of Use Case
Internal   External

Overall Objective
BMA – D7.1

Link to the Business Modelling Approach
Key Partners

Procedure
Compare partners to find the best partner for each resource

Methods & Tools
BMA – M1.5 Brainstorming

PM – A2.6 Benchmark of possible implementation partners

Activity – How can the goal be reached?

Index
BMA – A7.3

Title
Identify the relevant stakeholders

Type of Use Case
Internal | External

Overall Objective
BMA – D4.2 | BMA – D4.3

Link to the Business Modelling Approach

Key Partners

Procedure

1. Identify the relevant stakeholders by answering the following questions:
   - Who is involved in a project?
   - Who is invested in the outcome?
   - Who has right of refusal?
   - Who will support the team?
   - Who are the key decision makers?
   - Who should the team meet with to get context?

2. Map out all relevant stakeholders

Methods & Tools

BMA – M1.5 Brainstorming

BMA – M7.1 Stakeholder Map

Activity – How can the goal be reached?

Index
BMA – A7.4

Title
Differentiate between stakeholders and categorize them

Link to the Business Modelling Approach

Key Partners

Type of Use Case
Internal **External**

Overall Objective
BMA – D7.2

Procedure
1. Categorize stakeholders depending on attributes (e.g. Power, Interest, Attitude)

2. Determine how stakeholders should be managed depending on their attributes

Methods & Tools
BMA – M7.2 Power-Interest-Attitude-Matrix

Activity – How can the goal be reached?

Index
BMA – A7.5

Title
Investigate relationships between stakeholders

Type of Use Case
Internal | External

Overall Objective
BMA – D7.2

Link to the Business Modelling Approach

Key Partners

Procedure
1. Investigate how stakeholders relate to other stakeholders

2. Derive a project organization structure with the most positive stakeholder impact

Methods & Tools
BMA – M7.3 Actor-Linkage-Matrix

BMA – M7.4 Knowledge Mapping

BMA – M7.5 RACI-Mapping

Activity – How can the goal be reached?

Index
BMA – A8.1

Title
Determine the project organization needed to implement the Digital Twin

Type of Use Case
Internal | External

Overall Objective
BMA – D8.1

Link to the Business Modelling Approach

Organization

Procedure

1. Clarification of the project organization structure to be used

2. Determination of required persons/roles for the implementation of the project

3. Determining the responsibilities and tasks of the persons/roles

4. Assigning employees of the company to the persons/roles of the project organization structure

Note: The structure and composition of the teams may change as the project progresses → adjust if necessary.

Methods & Tools

BMA – M7.5 RACI-Mapping

PM – A1.4 Planning of the project (procedure & activities)

PM – A1.6 Form the project team

Activity – How can the goal be reached?

Index
BMA – A8.2

Title
Determine the project organization needed to run the solution after the implementation

Type of Use Case
Internal | External

Overall Objective
BMA – D8.1

Link to the Business Modelling Approach

Organization

Procedure

1. Clarification of the organization structure to be used to run the solution

2. Determination of required persons/roles after the implementation of the project

3. Determining the responsibilities and tasks of the persons/roles

4. Assigning employees of the company to the persons/roles of the project organization structure

Methods & Tools

BMA – M7.5 RACI-Mapping

Activity – How can the goal be reached?

Index
BMA – A8.3

Title
Summarize the organization by visualizing activities, resources, partner & stakeholders

Type of Use Case
Internal	External

Overall Objective
BMA – D8.1

Link to the Business Modelling Approach

Organization

Procedure

1. Visualize Activities

2. Connect Activities with Resources

3. Connect Activities & Resources with partners

4. Connect stakeholders with Activities, Resources & Partners

Methods & Tools

BMA – M7.5 RACI-Mapping

Activity – How can the goal be reached?

Index
BMA – A9.1

Title
Determine the additional costs during the implementation phase

Type of Use Case
Internal | External

Overall Objective
BMA – D9.1 | BMA – D9.2

Link to the Business Modelling Approach

Cost Structure

Procedure

1. Identify cost factors during the implementation phase and categorize them

2. Assume a monetary value based on experience, reference prices or competition to the cost factors

Methods & Tools

BMA – M9.1 Cost-Breakdown Analysis

Activity – How can the goal be reached?

Index
BMA – A9.2

Title
Determine the additional costs to maintain the Digital Twin after implementation

Type of Use Case
Internal | External

Overall Objective
BMA – D9.1 | BMA – D9.2

Link to the Business Modelling Approach

Cost Structure

Procedure

1. Identify cost factors to run and maintain the Digital Twin and categorize them

2. Assume a monetary value based on experience, reference prices or competition to the cost factors

Methods & Tools

BMA – M9.1 Cost-Breakdown Analysis

Activity – How can the goal be reached?

Index
BMA – A9.3

Title
Compare cost to value created/revenue streams

Link to the Business Modelling Approach

Cost Structure

Type of Use Case
Internal | External

Overall Objective
BMA – D9.1 | BMA – D9.2

Procedure

1. Compare costs to the value created/revenue streams

2. Determine the Break-Even-Point and calculate the profitability of the Digital Twin Implementation

Methods & Tools

BMA – M9.2 Break-Even Analysis

Index

BMA – M1.1

Title

Future Field Radar

Application for…

BMA – A1.1

Link to the Business Modelling Approach

Development Concept

Procedure / Description

1. Employees, who are responsible for shaping the content of the future fields as a whole, should decide on portfolio maintenance within the future fields together with the executives.
2. Those ideas and concepts are selected from among several competing proposals that can be further processed with the available, limited reserved resource capacity for the respective future field.
3. Display all proposals received within a search field in an overview radar, which should be differentiated according to maturity levels.

Visualization / Example
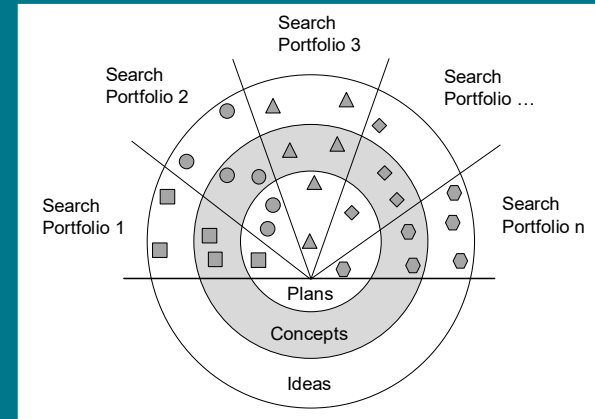
References & Links

- Miecznik (2013, p.165)

Templates

Future Field Radar

Index

BMA – M1.2

Title

Trend Radar

Application for…

BMA – A1.2

Link to the Business Modelling Approach

Development Concept

Procedure / Description

1. The radar can map four dimensions: Distance from the center, classification in a segment, size, and color coding of an object.
2. For example, the distance category can denote the presumed onset period of a trend:
   - The center of the radar is the current date at the time of the call, and the far edge of the radar is either a defined date or the date of the trend whose presumed time of occurrence is furthest in the future.
   - The categories of the radar are mapped in the segments and can be freely chosen and also changed over time

Visualization / Example

Segment 3

Segment 2

Segment …

Trend 1

Distance from center

Segment 1

Size and colour

Segment n
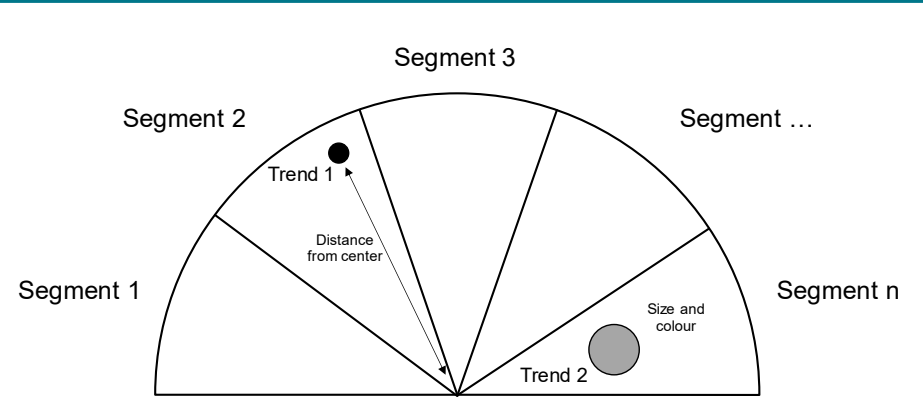
Trend 2

References & Links

- Durst (2010, pp. 81-82)

Templates

Trend Radar

Index

BMA – M1.3

Title

SWOT-Analysis

Application for…

BMA – A1.2

Link to the Business Modelling Approach

Development Concept

Procedure / Description

SWOT is a method to assess a businesses or project's internal Strengths, and Weaknesses and external Opportunities, and Threats.

- **Strengths**: attributes that help to outperform others
- **Weaknesses**: elements of the business or project that give a disadvantage to others
- **Opportunities**: aspects of the environment in which the company is operating, that could be used for an advantage.
- **Threats**: aspects of the environment in which the company is operating, that might impede the progress of the business or project.

1. Identify the internal (Strength & Weaknesses) and external factors (Opportunities & Threats) in a workshop (e.g. using brainstorming)
2. Assess and identify the most crucial factors
3. Derive relations existing between internal and external features. E.g. how can opportunities be turned into strengths? How can strengths be used to overcome threats?

Visualization / Example

	Helpful	Harmful
Internal	STRENGTHS	WEEKNESSES
External	OPPORTUNITIES	THREATS

References & Links

Lindemann (2009), Thompson and Martin (2010)

Templates

SWOT

Methods & Tools – How can the activities be supported?

Index

BMA – M1.4

Title

Benchmarking

Application for…

BMA – A1.2   BMA – A4.4

Link to the Business Modelling Approach

Development Concept & Revenue Stream

Procedure / Description

Benchmarking is a method to investigate differences in products, services, processes or methods, compared to one or several competitors. Further, reasons for the differences as well as improvement opportunities for the own business need to be determined.

1. Set a goal (e.g., reduction of cost, etc.)
2. Define competitors to be benchmarked
3. Derive the aspects to be compared.
4. Define and calculate KPIs (e.g., weight, cost, etc.)
5. Determine improvement opportunities

Visualization / Example

References & Links

Lindemann (2009), Passos and Haddad (2013) , Horváthová et al. (2021)

Templates

Methods & Tools – How can the activities be supported?

Index

BMA – M1.5

Title

Brainstorming

Application for…

BMA – A1.3	BMA – A5.2	BMA – A7.1	BMA – A7.2	BMA – A7.3

Link to the Business Modelling Approach

Development Concept, Key Activities & Key Partners

Procedure / Description

Brainstorming is an ideation method, aiming to create as many ideas as possible within a given time. It helps to reduce fixation to existing solutions and leads also to unconventional ideas.

1. Preparation: formulate problem and set a goal for the session, select and invite participants (if possible 5-10 persons , interdisciplinary and familiar with the problem), assign moderator
2. Execution: present the <u>rules of brainstorming</u>, discuss goal of the session, collect ideas. (Can be done as brainwriting, Possibly supported by methods like <u>6-3-5</u>, or <u>1-2-4-all</u>)
3. Debriefing: Document, consolidate and evaluate collected ideas

Visualization / Example

References & Links

Osborn (1957), Furnham (2000), Daenzer et al. (2002), Lindemann (2009), Gericke et al. (2021)

Templates

Methods & Tools – How can the activities be supported?

Index
BMA – M1.6

Title
Digital Twin Use Case Catalogue

Application for…
BMA – A1.3 | BMA – A4.2

Link to the Business Modelling Approach

Development Concept & Revenue Stream

Procedure / Description

1. Define the characteristics of the desired DT solution
2. Use one of the entry tickets of the use case catalogue
3. Apply analogy building to generate use case ideas from the use case catalogue

Visualization / Example

Open Search			
Quick Check	**Matrix DT Typology**	**DT Compass**	**DT Maturity Level**
Questionnaire for industry and appliction specific use cases and technological enablers.	Includes Lifecycle Stage and Benefits, Differentiation between DT Types	Focuses on requirements, time horizon and application area.	Considers Data Levels, Connections and DT Stages.

References & Links

- Wilberg et al. (2018)

Templates

Digital Twin Use Case Catalogue

Index

BMA – M1.7

Title

Benefit-Effort Portfolio

Application for…

BMA – A1.4　　BMA – A4.2

Link to the Business Modelling Approach

Development Concept & Revenue Stream

Procedure / Description

1. Present consolidated use cases in a workshop with all relevant stakeholders
2. Select a scale for the assessment. E.g. 1-5 for a linear scale or 1-3-9 for a progressive. Best practice is to do both and compare the outcome.
3. Let all participants anonymously assess the use cases' benefit
4. Let all participants anonymously assess the use cases' effort
5. Map all use cases in a portfolio
6. Identify use cases with the best benefit/effort ratio

Visualization / Example
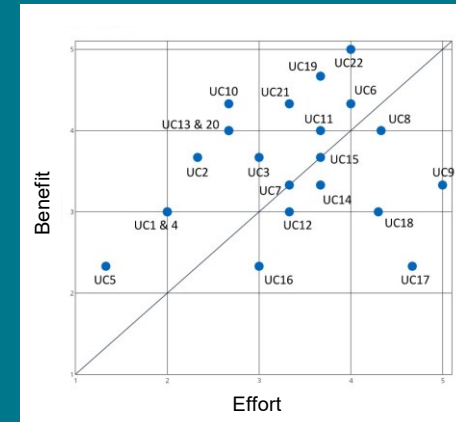
References & Links

- Lindemann (2009)

Templates

Methods & Tools – How can the activities be supported?

Index

BMA – M1.8

Title

Categorization & Clustering

Application for…

BMA – A1.4

Link to the Business Modelling Approach

Development Concept

Procedure / Description

1. Specify categories for clustering use cases. General categories could be "benefiting stakeholders", "lifecycle phase", or "input data".
2. Define the attributes of the categories.
3. Build a Domain-Mapping Matrix (DMM) of use cases and attribute
4. Calculate the Design Structure Matrix (DSM) by multiplying the DMM with its transposed matrix (cf. visualization)
5. Cluster DSM to identify commonalities in use cases.
6. Calculate combined benefit effort for the clusters to select the most promising one.

Visualization / Example
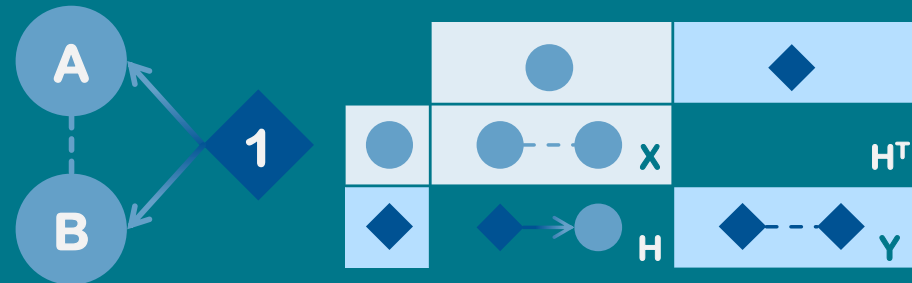
Computation Scheme: $X=H^T \cdot H$ $Y=H \cdot H^T$

References & Links

- Lindemann et al. (2008)

Templates

Methods & Tools – How can the activities be supported?

Index
BMA – M1.9

Title
Digital Twin Readiness Framework

Application for…
BMA – A1.5

Link to the Business Modelling Approach

Development Concept

Procedure / Description

Assess the organizational readiness for the implementation of a Digital Twin.

Key elements that should be considered include:
- Processes
- Technology
- Governance
- People
- Strategy & Organization
- IT ecosystem
- Partners

Visualization / Example

Strategy & Organization

DT Strategy Definition	DT Strategy Penetration	DT Understanding & Awareness
Published	Company	Business employees
Defined	BU	
	Teams	IT employees
Concept	Experts	
Idea	Individuals	Experts

Process — Process Definition

MBD	MBSE	MBPE
Implemented		
Implementation started		
Concept		
Idea		

IT Ecosystem

IT-Tool readiness for model linkage with services	Semantic Data Model for DT	Backend implementation
Data linkage based on standards	Cross-domain configuration modeled	Rollout
	Individual Domains modeled	Implemented by federation or integration
Data linkage with proprietary interfaces	Methodology and Concept defined	Implementation started
		Concept
manual linkage	not available	not available

Partner — Cross-Enterprise Collaboration

- Data collaboration with a common platform
- Data exchange based on standards
- based on individual data exchange
- not possible

Christ et al. (2022)

References & Links

Christ et al. (2022), Singh et al. (2021), Riedelsheimer et al. (2020), Tafvizi Zavareh and Eigner (2021)
https://dbd.au.dk/about-dmat/

Templates

Index

BMA – M1.11

Title

Pairwise Comparison & Weighted Scoring Analysis

Application for…

BMA – A1.6

Link to the Business Modelling Approach

Development Concept

Procedure / Description

Pairwise Comparison:
1. Put the elements in columns and rows of a matrix.
2. Assess for each cell, whether the element in the row is *less important (-1), equally important (0)* or *more important (1),* than the column.
3. Calculate row sums to derive scoring.

Weighted Scoring Analysis:
1. Select relevant criteria
2. Weigh the criteria using pairwise comparison
3. Score the options with respect to the criteria using pairwise comparison
4. Multiply the scores by the associated weights
5. Total the weighted scores
6. Rank the options and decide

Visualization / Example

"A is more important/ Better than C"

	A	B	C	Sum
A		-1	1	0
B	1		1	2
C	-1	-1		-2

Resulting Ranking

		Weight	Options			
			O_A		O_B	
Criteria	C_1	w_1	p_{A1}		p_{B1}	
				$p_{A1} * w_1$		$p_{B1} * w_1$
	C_2	w_2	p_{A2}		p_{B2}	
				$p_{A2} * w_2$		$p_{B2} * w_2$
Sum			$\sum_i p_{Ai} * w_i$		$\sum_i p_{Bi} * w_i$	
Rank						

References & Links

Lindemann (2009), Daenzer et al. (2002),

Templates

Pairwise Comparison & Weighted Scoring Analysis

Index

BMA – M1.12

Title

Shell Model

Application for…

BMA – A1.6

Link to the Business Modelling Approach

Development Concept

Procedure / Description

1. Identify the shells: Split the overall goal and vision of the digital twin project into subgoals and milestones. Put them into a logical order and define a rough roadmap.
2. Determine the use cases: Based on the clustering and prioritization of the use cases assign them to the shells. One should start with the "low-hanging fruits" (high value, low effort). From here, the digital twin can be extended layer-by-layer.
3. Derive a detailed roadmap: Starting from the shell model derive a detailed roadmap for the use cases.

Visualization / Example
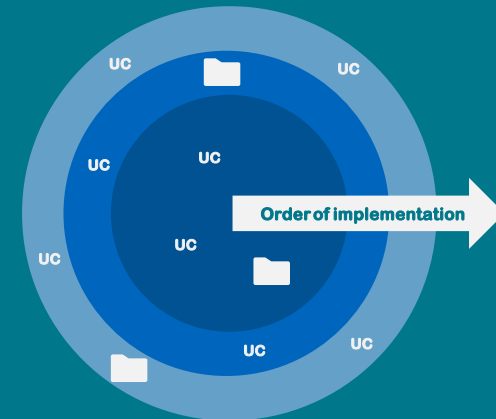
References & Links

Schweigert-Recksiek et al. (2020), Schweigert-Recksiek et al. (2022)

Templates

Index

BMA – M2.1

Title

Persona

Application for…

BMA – A2.1

Link to the Business Modelling Approach

Customer Segments

Procedure / Description

1. Determination of the users

2. Analysis of the working environment with the help of a Contextual Inquiry

3. Formulation of personas

4. Formulation of a scenario using the jobs-to-be-done method

Visualization / Example

References & Links

Pruitt and Grudin (2003)

Templates

Persona

Index

BMA – M2.2

Title

Value Proposition Canvas | Customer Profile

Application for…

BMA – A2.1

Link to the Business Modelling Approach

Customer Segments

Procedure / Description

- The Customer (Segment) Profile describes a specific customer segment in your business model in a more structured and detailed way. It breaks the customer down into its jobs, pains, and gains.
- Gains describe the outcomes customers want to achieve or the concrete benefits they are seeking.
- Pains describe bad outcomes, risks, and obstacles related to customer jobs.
- Customer Jobs describe what customers are trying to get done in their work and in their lives, as expressed in their own words.

Visualization / Example

Gains

Customer

Customer Jobs

Pains

References & Links

Osterwalder et al. (2014)

Templates

Value Proposition

Index

BMA – M2.3

Title

Market Analysis

Application for…

BMA – A2.2

Link to the Business Modelling Approach

Customer Segments

Procedure / Description

A market analysis is a comprehensive evaluation of a particular market in a given industry. The evaluation entails various aspects of the market, such as its size and worth, potential customer segments, purchasing behavior of target customers, competitors and their performance, as well as other crucial factors. Such an analysis should provide answers to certain critical questions such as…
- …who are the target customers?
- …what are their buying patterns?
- …what is the size of the target market and the customers' willingness to pay for the product?
- …who are the primary competitors and what are their strengths and weaknesses?

Visualization / Example

References & Links

Blake (2000), Freedman (2020)

Templates

Methods & Tools – How can the activities be supported?

Index

BMA – M2.4

Title

Porter's Five Forces

Application for…

BMA – A2.3
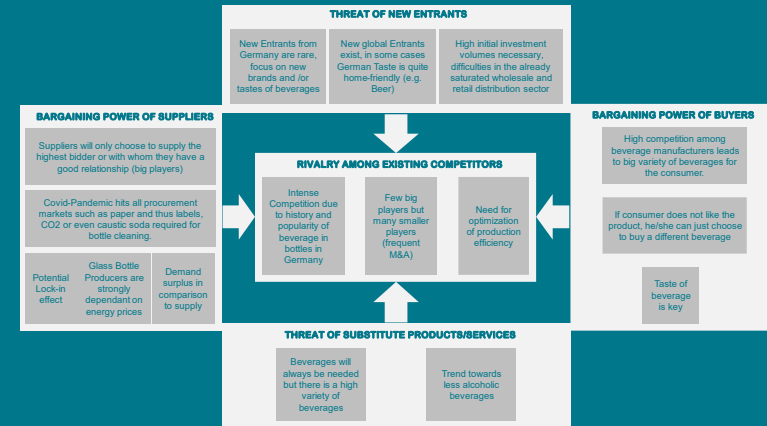
Link to the Business Modelling Approach

Customer Segments

Procedure / Description

The basic idea is that the attractiveness of the market is determined primarily by the market structure. The market structure in turn influences the strategic behavior of companies, i.e. their competitive strategy, which in turn determines their market success. Thus, the success of a company is at least indirectly dependent on the market structure. Porter (1996) identified 5 forces:

- "Bargaining power of customers"
- "Threat of new entrants"
- "The industry jockeying for position among current competitors"
- "Threat of substitute products or services"
- "Bargaining power of suppliers"

Visualization / Example

THREAT OF NEW ENTRANTS

New Entrants from Germany are rare, focus on new brands and /or tastes of beverages

New global Entrants exist, in some cases German Taste is quite home-friendly (e.g. Beer)

High initial investment volumes necessary, difficulties in the already saturated wholesale and retail distribution sector

BARGAINING POWER OF SUPPLIERS

Suppliers will only choose to supply the highest bidder or with whom they have a good relationship (big players)

Covid-Pandemic hits all procurement markets such as paper and thus labels, CO2 or even caustic soda required for bottle cleaning.

Potential Lock-in effect

Glass Bottle Producers are strongly dependant on energy prices

Demand surplus in comparison to supply

RIVALRY AMONG EXISTING COMPETITORS

Intense Competition due to history and popularity of beverage in bottles in Germany

Few big players but many smaller players (frequent M&A)

Need for optimization of production efficiency

BARGAINING POWER OF BUYERS

High competition among beverage manufacturers leads to big variety of beverages for the consumer.

If consumer does not like the product, he/she can just choose to buy a different beverage

Taste of beverage is key

THREAT OF SUBSTITUTE PRODUCTS/SERVICES

Beverages will always be needed but there is a high variety of beverages

Trend towards less alcoholic beverages

References & Links

Porter (1996), Grundy (2006)

Templates

Porter's Five Forces

Index

BMA – M2.5

Title

Customer/Employee Interview/Questionnaire

Application for…

BMA – A2.3   BMA – A3.3

Link to the Business Modelling Approach

Customer Segments & Value Proposition

Procedure / Description

Customer/Employee Interviews/Questionnaires are done if…
• you want to know if people will like (and buy) your new product.
• customers like your design changes/new features
• you want to get to know your customers better

1. Preparation
2. Conducting the Interview
3. Summarize and evaluate results with team

For detailed instructions see: https://www.atlassian.com/team-playbook/plays/customer-interview

Visualization / Example

1. Preparation	Assembly of Interview Team, Choosing the right customer, preparing the interview script
2. Interview	Greeting and Introduction
	Introductory Questions
	More difficult questions
	Questions of observants
	Questions of Interviewee
	Conclusion
Summary and Evaluation	Evaluation of results with next steps

References & Links

Atlassian (2023), Hardavella et al. (2016)

Templates

Index

BMA – M2.6

Title

Focus Group Discussion (FGD)

Application for…

BMA – A2.3   BMA – A3.3

Link to the Business Modelling Approach

Customer Segments & Value Proposition

Procedure / Description

Focus Group Discussion (FGD) is a qualitative research method (similar to an interview), where different people with similar background and expertise are brought together to discuss a specific topic.

1. Define goal of the session
2. Identify relevant stakeholders and invite them
3. **Pre-session:** set up room, familiarize with the group dynamics, facilities and equipment
4. **During the session:** Moderate the group discussion and record it. Keep track of follow-up questions and conclude at the end.
5. **Post-session:** Analyze, interpret and discuss the results

Visualization / Example

References & Links

Nyumba et al. (2018), Morgan et al. (1998)

Templates

Index

BMA – M3.2

Title

Perceptual Map

Application for…

| BMA – A3.2 | BMA – A5.3 |

Link to the Business Modelling Approach

Value Proposition & Key Activities

Procedure / Description

- The Perceptual Map can be used to identify the position of the product or service in the market.
- A perceptual map provides a visual representation of customers' or potential customers' perceptions of certain attributes of a product or service or an idea.

1. The customers or the target customers are supposed to place the products on the diagram relative to each other.
2. Subsequently, the result provides the information about the position of the product compared to other product.

Visualization / Example

+ High (more features)

Company A

Company B

Low (lower price) ←→ + High (higher pric

Company C

- Low (less features)
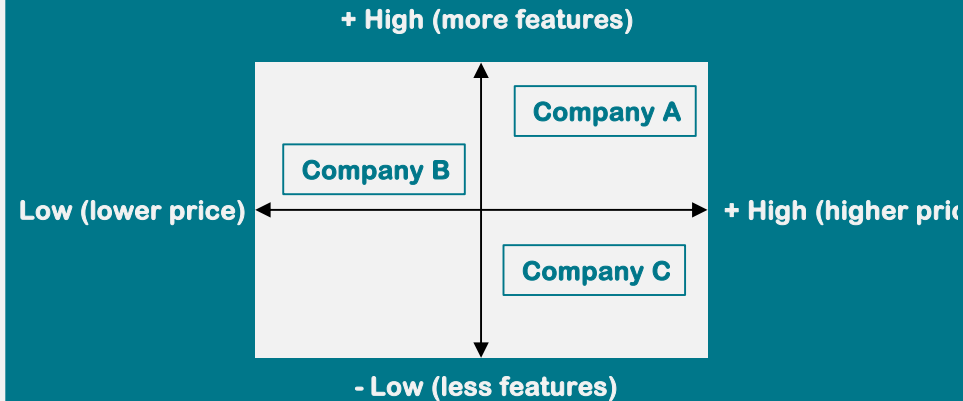
References & Links

Fox (1988), Gower et al. (2010)

Templates

Perceptual Map

Index

BMA – M3.4

Title

Expert Interview

Application for…

BMA – A3.4   BMA – A1.1   BMA – A2.2   BMA – A2.3

Link to the Business Modelling Approach

Development Concept, Customer Segments & Value Proposition

Procedure / Description

- Purpose: Information acquisition of tacit knowledge.

- Procedure:
  1. Narrow down topic area
  2. Determine interview goal and guiding questions
  3. Acquire knowledge on the interview topic
  4. Select stakeholders/experts
  5. Conduct interview (in individual/group meetings)
  6. Document and analyze results
  7. Review of the expert interview

Visualization / Example

References & Links

Bogner et al. (2009)

Templates

Methods & Tools – How can the activities be supported?

Index

BMA – M4.1

Title

Kano-Model

Application for…

BMA – A4.1

Link to the Business Modelling Approach

Revenue Stream

Procedure / Description

- The Kano-Model is a model for systematically achieving customer satisfaction in a project or for a complex product. It describes the relationship between the achievement of certain characteristics of a product / service and the expected satisfaction of customers.
- The Kano model distinguishes five levels of quality:
  - **Basic characteristics** that are so fundamental and self-evident that customers only become aware of them when they are not met (implicit expectations). If the basic requirements are not met, dissatisfaction arises; if they are met, however, satisfaction does not arise. The increase in benefit compared to differentiation from competitors is very small.
  - **Performance characteristics** are conscious to the customer, they eliminate dissatisfaction or create satisfaction depending on the extent of fulfillment.
  - **Excitement features**, on the other hand, are benefit-creating features that the customer does not necessarily expect. They distinguish the product from the competition and evoke enthusiasm. A small increase in performance can lead to a disproportionate benefit. The differentiation from the competition can be small, but the benefits enormous.
  - **Irrelevant features,** both when present and absent, are of no concern to the customer. Therefore, they cannot create satisfaction, but they also do not lead to dissatisfaction.
  - **Rejection features:** If present, lead to dissatisfaction; if absent, lead to customer satisfaction.

Visualization / Example

Satisfied

Performance Attributes

Excitement Attributes

Product Dysfunctional

Product Fully Functional

"Must-Haves"

Customer

References & Links

Kano et al. (1996), Kametani et al. (2010)

Templates

Methods & Tools – How can the activities be supported?

Index
BMA – M4.2

Title
Magic Triangle

Application for…
BMA – A4.1   BMA – A4.2

Link to the Business Modelling Approach
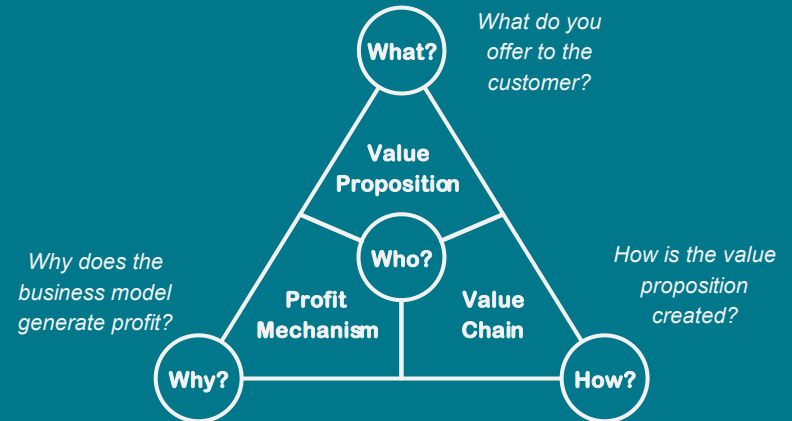*Revenue Stream*

Procedure / Description

The St. Gallen Magic Triangle supports in the identification of the most important drivers of successful business models and therefore helps to build innovative business models.

Fill it, by answering the following questions:
1. "Who" is the key customer, the business model is addressing?
2. "What" is the value that will be offered to the customer?
3. "How" can the value proposition be delivered to the customers?
4. "Why" is the solution beneficial? Describe the profit for the company.

Visualization / Example

What do you offer to the customer?

What?

Value Proposition

Who?

Why does the business model generate profit?

Profit Mechanism

Value Chain

How is the value proposition created?

Why?

How?

References & Links

Gassmann and Frankenberger (2016)
Aarhus University, Department of Business Development and Technology (2023)

Templates

Index

BMA – M4.3

Title

Financial Benefit Analysis

Application for…
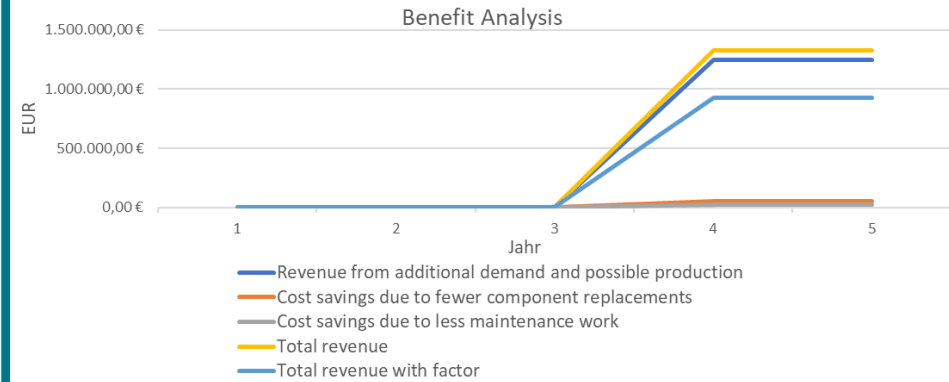
BMA – A4.3

Link to the Business Modelling Approach

Revenue Stream

Procedure / Description

1. Calculate the benefits of the value proposition through revenue increase and cost savings
2. Consider all categories of cost suggested by Ehrlenspiel et al. (2021)
3. Map them in a plot to visualize the economic profitability of the focal use case

Visualization / Example

Benefit Analysis

Legend:
- Revenue from additional demand and possible production
- Cost savings due to fewer component replacements
- Cost savings due to less maintenance work
- Total revenue
- Total revenue with factor

References & Links

Ehrlenspiel et al. (2021)

Templates

Methods & Tools – How can the activities be supported?

Index
BMA – M4.4

Title
Overall Equipment Effectiveness

Application for…
BMA – A4.3

Link to the Business Modelling Approach

Revenue Stream

Procedure / Description

- The Overall Equipment Effectiveness (OEE) metric can be used to measure the current availability and value of a production facility. It identifies the percentage of production time that is truly productive. This ratio is the product of three factors:
  - Equipment Availability
  - Performance Level
  - Quality Rate

- An OEE of 100% means that 100% quality (only good parts are produced),100% performance (e.g. as fast as possible) and 100% availability (no downtime during the manufacturing process.

- $OEE = \frac{B}{A} * \frac{D}{C} * \frac{F}{E}$

Visualization / Example

A Available time — Not scheduled for production

B Running time — Availability Loss

C Theoretical production

D Real production — Performance Loss

E Real production

F Good products — Quality Loss

References & Links

Corrales et al. (2020), R. Singh et al. (2013), Vorne Industries Inc. (2023)

Templates

Free tools for OEE (Vorne Industries Inc.)

Methods & Tools – How can the activities be supported?

Index
BMA – M6.1

Title
Resource Requirement Plan

Application for…
BMA – A6.1 **PM – A1.5**

Link to the Business Modelling Approach

Key Resources

Procedure / Description

1. Determine which resources are needed to achieve the goal (people and equipment)

2. Determine at which points in time these resources are needed

Visualization / Example

Required Resources		
Knowledge	**Human Resources**	**Raw material**
• Understanding DT concept • Implementation of DT in companies • Technical Implementation of DT concept	• Project Lead • Business Analyst • Tech Developer	• Bottling plant • DT-capable software • Sensor data

References & Links

Drews (2021), Qi et al. (2021)

Templates

Methods & Tools – How can the activities be supported?

Index

BMA – M6.2

Title

Resource Inventory

Application for…

BMA – A6.1   PM – A1.5

Link to the Business Modelling Approach

Key Resources

Procedure / Description

Analyze which resources are currently available in the company and where there is a need for additional resources

Visualization / Example

Resource Inventory					
Knowledge		Human Resources		Raw material	
Available	Not Available	Available	Not Available	Available	Not Available
Understanding DT concept Technical Implementation of DT concept	Implementation of DT in companies	Project Lead Tech Developer	Business Analyst	Bottling plant DT-capable software	Sensor data

References & Links

Drews (2021)

Templates

Resource Inventory

Index

BMA – M7.1

Title

Stakeholder Map

Application for…

BMA – A7.3

Link to the Business Modelling Approach

Key Partners

Procedure / Description

- Stakeholder mapping is a way to organize all the people who have an interest in your product, project, or idea into a single visual area. This makes it easy for you to see who can influence your project and how each person relates to the other.

- Stakeholder mapping is usually done at the beginning of a project. Stakeholder mapping early on helps avoid misunderstandings, ensures that all groups are aligned with goals, and sets expectations for deliverables.

Visualization / Example
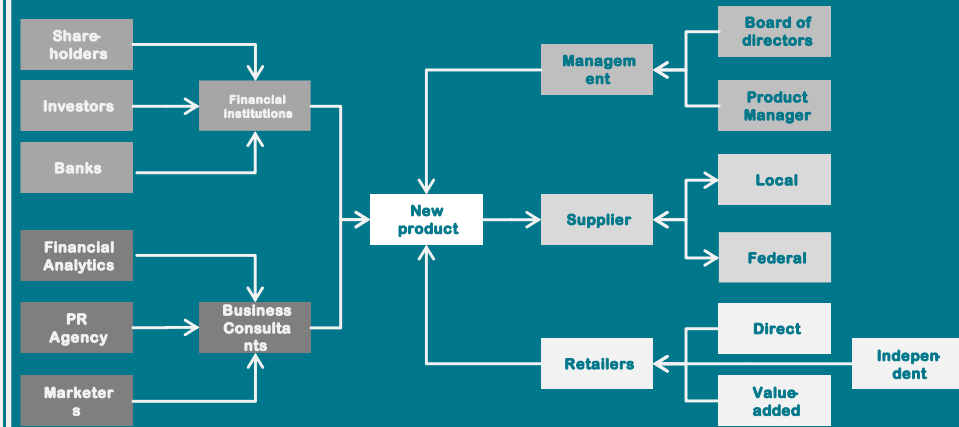
References & Links

Miro Inc. (2019), Murray-Webster, Simon (2006)

Templates

https://miro.com/blog/stakeholder-mapping/

Methods & Tools – How can the activities be supported?

Index

BMA – M7.2

Title

Power-Interest-Attitude-Matrix

Application for…

BMA – A7.4

Link to the Business Modelling Approach

Key Partners

Procedure / Description

According to Murray-Webster and Simon (2006), assign your stakeholders to their respective degree of influence, interest/availability, shareholder knowledge and stakeholder attitude to characterize them into the following:

- **"Savior** – powerful, high interest, positive attitude or alternatively influential, active, backer. They need to be paid attention to; you should do whatever necessary to keep them on your side – pander to their needs."
- **"Friend** – low power, high interest, positive attitude or alternatively insignificant, active, backer. They should be used as a confidant or sounding board."
- **"Saboteur** - powerful, high interest, negative attitude or alternatively influential, active, blocker. They need to be engaged in order to disengage. You should be prepared to 'clean-up after them'."
- **"Irritant** – low power, high interest, negative attitude or alternatively insignificant, active, blocker. They need to be engaged so that they stop 'eating away' and then be 'put back in their box'."
- **"Sleeping Giant** - powerful, low interest, positive attitude or alternatively influential, passive, backer. They need to be engaged in order to awaken them."
- **"Acquaintance** –low power, low interest, positive attitude or alternatively insignificant, passive, backer. They need to be kept informed and communicated with on a 'transmit only' basis."
- **"Time Bomb** - powerful, low interest, negative attitude or alternatively influential, passive, blocker. They need to be understood so they can be 'defused before the bomb goes off'."
- **"Trip Wire** – low power, low interest, negative attitude or alternatively insignificant, passive, blocker. They need to be understood so you can 'watch your step' and avoid 'tripping up'."

Visualization / Example

Power/Influence (vertical axis) vs **Interest/Availability** (horizontal axis):

	Keep Satisfied	Manage Closely
	Project Lead / Tech Developer	
	Monitor	Keep Informed / Manager

Stakeholder Knowledge (vertical axis) vs **Stakeholder Attitude** (horizontal axis):

	Aware / Opposition	Aware / Support
	Tech Developer	Project Lead / Manager
	Ignorant / Opposition	Ignorant / Support
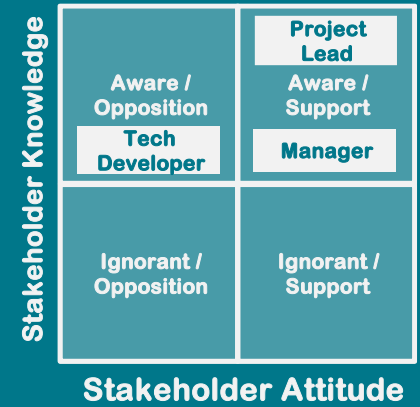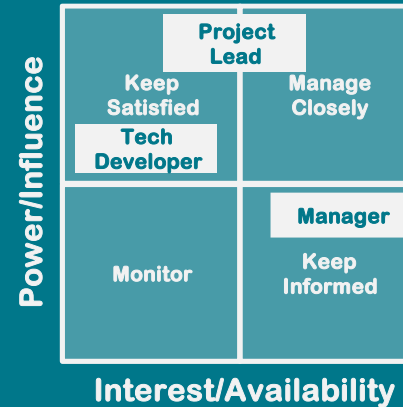
References & Links

Murray-Webster and Simon (2006)

Templates

Power Interest Attitude Matrix

Methods & Tools – How can the activities be supported?

Index

BMA – M7.3

Title

Actor-Linkage-Matrix

Application for…

BMA – A7.5

Link to the Business Modelling Approach

Key Partners

Procedure / Description

The Actor-Linkage-Matrix supports in analyzing the relationships of different stakeholders.

1. Enter identified stakeholders in the head-row and head-column of a two-dimensional matrix
2. Fill the cells by using one of the following codes:
   - Conflict
   - Complementary
   - Cooperation

Visualization / Example

	Stakeholder 1	Stakeholder 2	Stakeholder 3
Stakeholder 1	-	Complementary	Cooperation
Stakeholder 2	-	-	Conflict

References & Links

Reed et al. (2009)

Templates

Actor-Linkage-Matrix

Methods & Tools – How can the activities be supported?

Index
BMA – M7.4

Title
Knowledge Mapping

Application for…
BMA – A7.5

Link to the Business Modelling Approach

Key Partners

Procedure / Description

- Knowledge Mapping can be used to graphically represent knowledge and information. This can be subjective knowledge, i.e. individual thought models of a person, or knowledge to be conveyed in pedagogical-psychological learning processes.

- Terms or central concepts on a topic are taken as nodes in a net and the relations between these concepts are shown as connecting lines (arrows)

Visualization / Example

Financial institutions — Invest money to develop → New product
Business Consultants — Assist product development → New product
New product → Monitors the development of → Management
New product — Requires other → Supplier
New product — Is sold by → Retailers
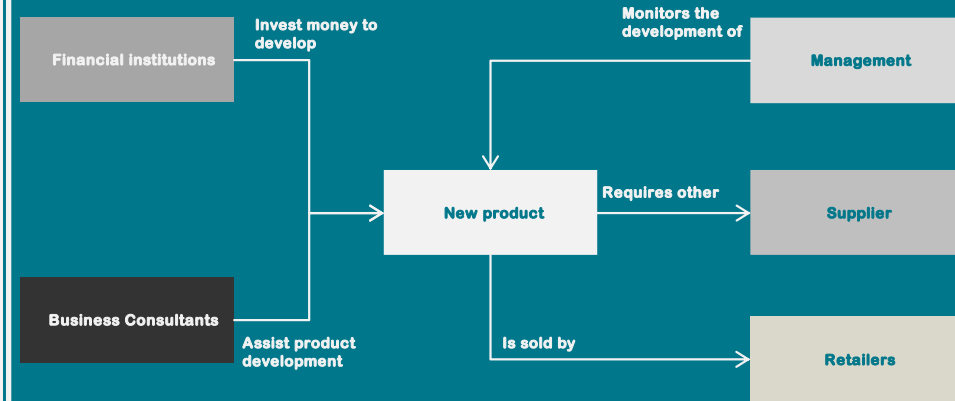
References & Links

Pelz et al. (2004)

Templates

Knowledge Mapping

Index

BMA – M7.5

Title

RACI

Application for…

| BMA – A7.5 | BMA – A8.1 | BMA – A8.2 | BMA – A8.3 |

Link to the Business Modelling Approach

Key Partners, Organization

Procedure / Description

1. Assign each stakeholder to the RACI Map by using the following rules:
   - **R**esponsible: Doing the work – the core team, generally
   - **A**ccountable: Answers for the work – often leadership
   - **C**onsulted: Experts/SMEs to learn from
   - **I**nformed: Kept in the Loop
   - Markers
     - Decision Maker
     - Heavy Influencer
     - Manage Closely
2. Describe the relationship of each stakeholder to the other
3. Set up RACI-Matrix to assign Roles to tasks/activities

Visualization / Example

☆ Decision Maker

◇ Heavy Influencer

▲ Manage Closely

Informed
Consulted
Accountable
Responsible

Miscommunication in the past

Work well together

Difficult

S1 · S2 · S3
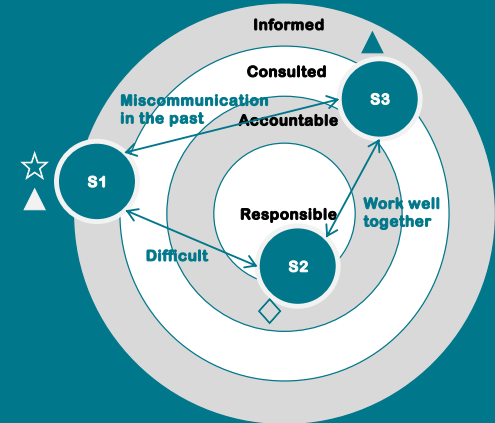
References & Links

Smith et al. (2005)

Templates

RACI-Mapping

RACI-Matrix

Index

BMA – M9.1

Title

Cost Breakdown Analysis

Application for…

BMA – A9.1   BMA – A9.2

Link to the Business Modelling Approach

Cost Structure

Procedure / Description

- Cost Breakdown Analysis is a cost analysis technique that breaks down the cost of a product or service into individual components – the cost drivers.
- This approach is commonly used to reduce costs and is a good opportunity for businesses.
- Direct costs such as labor, raw materials, and subcontracting are the most common factors. These are areas where a business has direct control and can identify ways to save money through proper use of cost breakdown analysis. But also, indirect costs are relevant.
- Costs should be differentiated in variable and fixed costs.

Visualization / Example
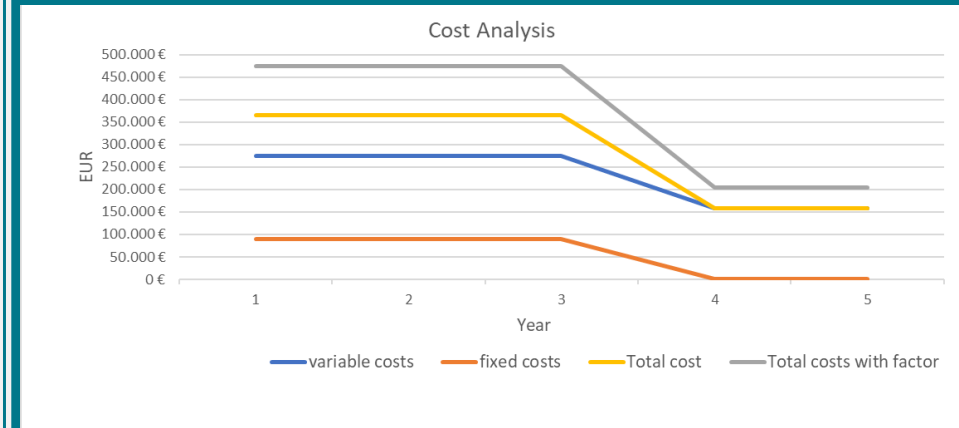
References & Links

Ehrlenspiel et al. (2021), Asking and Gustavsson (2011)

Templates

Cost Analysis, Break-Even Analysis

Methods & Tools – How can the activities be supported?

Index

BMA – M7.5

Title

Break Even Analysis

Application for…

BMA – A9.3

Link to the Business Modelling Approach

Cost Structure

Procedure / Description

- Break-even analysis is about calculating the margin of safety for a business by comparing its revenues and costs.
- It shows how many sales are needed to cover the cost of doing business. By analyzing different price levels and their corresponding demand levels, break-even analysis determines the level of sales required to cover the company's fixed costs.
- A demand-side analysis can provide valuable insights into a seller's selling capabilities.

Visualization / Example

Legend:
- Total cost
- Total costs with factor
- Total revenue
- Total revenue with factor
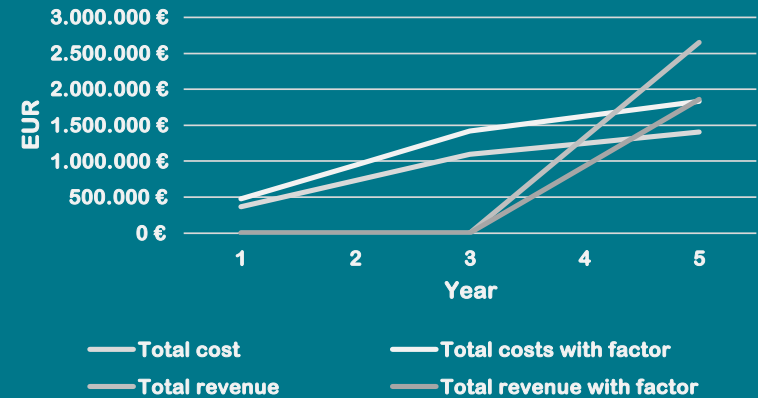
References & Links

Ehrlenspiel et al. (2021), Hayes (2008)

Templates

Cost Analysis, Break-Even Analysis

Deliverable – What has to be achieved?

Index
BMA – D1.1

Title
Prioritized Use Cases and Use Case Clusters

Input for…
BMA – A2.1

Link to the Business Modelling Approach

Development Concept, Customer Segments

Content

- List of Use Cases generated by trend analysis and evaluated business model

- Use Case List categorized

- Categorized Use Case List prioritized

- Use Cases aggregated to clusters

- Internal or External Use Case

- Decision with which use case to proceed.

Goal

- Restricting the broad application space of Digital Twins

- Early preselection reduces business modelling effort

- Concretize the abstract project goals

- Facilitate business modelling of the Digital Twin by creating manageable use cases

- Specifying a concrete direction for the business modelling

Check Questions

- ☐ How does the company grow in the existing business model? (BMA-A1.2)
- ☐ How can global trends/innovative technologies be applied to the business model? (BMA-A1.1, BMA-A1.3)
- ☐ Which Use Cases are the most attractive for the current business model? (BMA-A1.4, BMA-A1.6)
- ☐ How ready is the organization for the Digital Twin? (BMA-A1.5)
- ☐ What is the Digital Twin-readiness concerning the data/information flow in the process and the used technologies in the IT ecosystem? (BMA-A1.5)
- ☐ Are there additional digital solutions that could enhance the current product/system? (BMA-A1.1, BMA-A1.2, BMA-A1.3)

Deliverable – What has to be achieved?

Index
BMA – D2.1

Title
Information to validate value proposition

Input for…
BMA – A3.1 BMA – A3.3

Link to the Business Modelling Approach

Customer Segments, Value Proposition

Content
- Information on customer segments
- Information on market size
- Information on market background

Goal
Well-founded basis of information to be able to validate the value proposition properly

Check Questions
- ☐ For whom do we create value? [Osterwald, 2014] | Are they internal or external customers? (BMA-A2.1)
- ☐ How do we describe and differentiate our target customers? [Nagl, 2018] (BMA-A2.1)
- ☐ Is the market growing? If yes, in which direction? [Nagl, 2018] (BMA-A2.2)
- ☐ Does the service/product offering run the risk of cannibalizing existing customer relationships? [Nagl, 2018] (BMA-A2.3)
- ☐ Which customer might find which data interesting? (BMA-A2.1)
- ☐ Which customer is ready for the Digital Twin topic? (BMA-A2.1, BMA-A2.3)
- ☐ Which customers could be champions in Digital Twin/Data? (BMA-A2.1)

Deliverable – What has to be achieved?

Index
BMA – D2.2

Title
Possible Customer Segments and their profiles

Input for…
BMA – A3.2 | BMA – A4.4 | BMA – Business modelling Canvas

Link to the Business Modelling Approach

Customer Segments, Value Proposition, Revenue Stream, BM

Content
- Information on customer segments

Information on customer profiles

Information on market background

Goal
- Narrowing down the possible customer segments

- Definition of the customer segments in order to be able to adapt to them more strongly

Check Questions
☐ For whom do we create value? [Osterward, 2014] | Are they internal or external customers? (BMA-A2.1)
☐ How do we describe and differentiate our target customers? [Nagl, 2018] (BMA-A2.1)
☐ Is the market growing? If yes, in which direction? [Nagl, 2018] (BMA-A2.2)
☐ Which customer might find which data interesting? (BMA-A2.1)
☐ Which customer is ready for the Digital Twin topic? (BMA-A2.1)
☐ Which customers could be champions in Digital Twin/Data? (BMA-A2.1)

Deliverable – What has to be achieved?

Index
BMA – D3.1

Title
Validated value proposition

Input for…
BMA – A4.1 | **BMA – Business modelling Canvas**

Link to the Business Modelling Approach

Value Proposition, Revenue Stream, BM

Content

- Information gathered about customers validated

- Adjusted value proposition based on Feedback

- Decision, whether to continue with the Use Case or return to the List of Prioritized Use Cases

Goal

- Validation, if assumptions about Use Cases are valid and to which degree they are valid

- Decision whether to continue with the Use Case, to adapt it to the feedback or return to the list of prioritized Use Cases

Check Questions

☐ Which customer needs do we meet? Osterwalder (2011) (BMA-A3.1, BMA-A3.3)
☐ Which problems of our customers do we help to solve Osterwalder (2011) (BMA-A3.1)
☐ Have we validated the value proposition? (BMA-A3.4)
☐ What alternatives does the customer have? Are we building more valuable customer value? Maurya (2012) (BMA-A3.2)

Deliverable – What has to be achieved?

Index

BMA – D4.1

Title

Product to be offered to each segment

Input for…

| BMA – A5.1 | BMA – A5.4 | BMA – Business modelling Canvas |

Link to the Business Modelling Approach

Revenue Stream, Key Activities, BM

Content

- Define a value proposition for each customer segment

- Forge the value proposition into a product

Goal

- Tailored product and value proposition for each individual customer segment

Check Questions

☐ Which value is offered to which customer? (BMA-A4.1, BMA-A4.2)
☐ How strong is the added value of the potential data use for the customer? (BMA-A4.2)

Deliverable – What has to be achieved?

Index
BMA – D4.2

Title
Understand the way how to generate revenue from each customer segment

Input for…
BMA – A5.2

Link to the Business Modelling Approach

Revenue Stream, Key Activities

Content

1. Channel through which the transaction/payment from the customer segments will be done

2. How the customer segments will pay for the product (Pricing)

3. Mechanism to scale the revenue

Goal

- Framework how transactions/payments of the customer segments will be done

- Pricing Model for each customer segment and product

- Assessment of Use Case scalability

Check Questions

- ☐ Which value is offered to which customer? (BMA-A4.1, BMA-A4.2)
- ☐ How will the revenue be generated? (BMA-A4.4)
- ☐ What are the possible sales scenarios? (Best-Case, Most-Likely, Worst-Case) (Nagl, 2018) (BMA-A4.4)
- ☐ What pricing is assumed for the products/services? (Nagl, 2018) (BMA-A4.4)

Deliverable – What has to be achieved?

Index
BMA – D4.3

Title
Expected revenue or value created

Input for…
BMA – A9.3	BMA – Business modelling Canvas

Link to the Business Modelling Approach

Revenue Stream, Cost Structure, BM

Content
- Benefits of using the Digital Twin
- Benefits assigned monetary value

Goal
- Determine to which extent the Value Proposition creates value for the customer
- Determine to which extent the customer is willing to pay for this value

Check Questions
- ☐ How strong is the added value of the potential data use for the customer? (BMA-A4.2, BMA-A4.3)
- ☐ How much does the customer save or increase her/his revenue by using Digital Twin? (BMA-A4.3)

Deliverable – What has to be achieved?

Index
BMA – D5.1

Title
The activities needed to implement the Digital Twin

Input for…
BMA – A6.1	BMA – A8.1	BMA – A8.2	BMA – A9.1	BMA – A9.2	BMA – Business modelling Canvas

Link to the Business Modelling Approach

Key Activities, Key Resources, Organization, Cost Structure, BM

Content

1. The technical activities needed to implement the Digital Twin

2. The organizational and business activities needed to implement the Digital Twin

Goal

- Shows the activities for the implementation of the Use Case

Check Questions

- ☐ Which Key Activities do our value propositions require? (implementing and running the Digital Twin) (Osterwalder et al., 2014) (BMA-A5.1)
- ☐ How do I get customers to share their data? (BMA-A5.1)
- ☐ How will the data processing be handled? (BMA-A5.1)
- ☐ What are the main steps to go through to analyse and evaluate the data? (BMA-A5.1)

Deliverable – What has to be achieved?

Index
BMA – D5.2

Title
The activities needed to support the revenue stream and manage the customer communication and relationship

Input for…
BMA – A6.1	BMA – A8.1	BMA – A8.2	BMA – A9.1	BMA – A9.2	BMA – Business modelling Canvas

Link to the Business Modelling Approach

Key Activities, Key Resources, Organization, Cost Structure, BM

Content

- The channels through which the value proposition is communicated to the customer:
  - Value communication
  - Value delivery
- The organizational and business activities needed to support the revenue stream
- The activities through which the customer relationship is established
- The activities through which the customer relationship is maintained
- The activities through which the customer relationship can be improved and extended

Goal

- Shows the activities for the setup of the customer communication and relationship

Check Questions

- ☐ Which Key Activities are needed to generate and maintain the revenue stream? (Osterwalder et al., 2014) (BMA-A5.2)
- ☐ Which channels do our customers expect us to use for communication and value delivery? (Jodlbauer, 2020) (BMA-A5.3)
- ☐ How do I get customers to share their data? (BMA-A5.2)
- ☐ How will the data processing be handled? (BMA-A5.2)
- ☐ What are the main steps to go through to analyze and evaluate the data? (BMA-A5.2)

Deliverable – What has to be achieved?

Index

BMA – D5.3

Title

The activities needed to run the solution

Input for…

BMA – A6.1	BMA – A8.1	BMA – A8.2	BMA – A9.1	BMA – A9.2	BMA – Business modelling Canvas

Link to the Business Modelling Approach

Key Activities, Key Resources, Organization, Cost Structure, BM

Content

- The technical activities needed to run the solution after the implementation phase

- The organizational and business activities needed to run the solution after the implementation phase

Goal

- Shows the activities for the continuous run of the Use Case/Digital Twin

Check Questions

- ☐ Which Key Activities do our value propositions require? (implementing and running the Digital Twin) (Osterwalder et al., 2014) (BMA-A5.4)

Deliverable – What has to be achieved?

Index
BMA – D6.1

Title
The resources needed to realize the Use Case

Input for...
BMA – A7.1	BMA – A7.3	BMA – A8.1	BMA – A8.2	BMA – Business modelling Canvas

Link to the Business Modelling Approach

Key Resources, Key Partners, Organization, BM

Content

- List of Required resources to realize the Use Case (people and equipment)

- Assignment of resources to the points in time these resources are needed

Goal

- Overview of required resources

- Overview to which degree and at what point in time resources are required

Check Questions

- ☐ What key resources do our key activities require ? (Jodlbauer, 2020) (BMA-A6.1)
- ☐ Do we need to acquire more knowledge? If yes, which? (BMA-A6.1)
- ☐ Which key resources do we provide ourselves? (Jodlbauer, 2020) (BMA-A6.2)
- ☐ What data do I need and where do I get this data from? (BMA-A6.1, BMA-A6.2)
- ☐ What IT infrastructure do I need to implement the Digital Twin? (Nagl, 2018) (BMA-A6.1)
- ☐ What data do I need from the customer? (BMA-A6.1)

Deliverable – What has to be achieved?

Index
BMA – D6.2

Title
The activities & resources that can be covered internally

Input for…
BMA – A7.1   BMA – A7.3

Link to the Business Modelling Approach

Key Resources, Key Partners

Content
- List of Resources that are currently available in the company

- List of Resources that need to be sourced externally

Goal
- Identify Resources that need to be sourced externally

- Assessment how internal capacities need to be changed in order to fill the created resource gaps

Check Questions
- ☐ What key resources do our key activities require ? (Jodlbauer, 2020) (BMA-A6.1)
- ☐ Do we need to acquire more knowledge? If yes, which? (BMA-A6.1)
- ☐ Which key resources do we provide ourselves? (Jodlbauer, 2020) (BMA-A6.2)
- ☐ What data do I need and where do I get this data from? (BMA-A6.1, BMA-A6.2)
- ☐ What IT infrastructure do I need to implement the Digital Twin? (Nagl, 2018) (BMA-A6.1)
- ☐ What data do I need from the customer? (BMA-A6.1)

Deliverable – What has to be achieved?

Index
BMA – D7.1

Title
All Key Partners identified to provide the resources not covered internally

Input for…
| BMA – A8.1 | BMA – A8.2 | BMA – A9.1 | BMA – A9.2 | BMA – Business modelling Canvas | PM – A4.1 |

Link to the Business Modelling Approach

Key Partners, Organization, Cost Structure BM

Content
- Assessment whether resources can be provided by partners
- Assessment how beneficial outsourcing to partners can be for specific resources
- List of Resources that are to be provided by partners
- Benchmark of partners to find the best partner for each resource

Goal
- Decision, which partner to include in the project team
- Acquisition of reliable and dependable partners who enhance the Use Case realization process

Check Questions
- ☐ Which key partners are needed for which activities/resources? (Jodlbauer, 2020; Nagl, 2018) (BMA-A7.1, BMA-A7.2)
- ☐ Do we have existing key partners, who could provide the needed resources and activities? (Nagl, 2018) (BMA-A7.2)
- ☐ Which partner can process the customer's data (and generate added value from it)? (BMA-A7.2)

Deliverable – What has to be achieved?

Index
BMA – D7.2

Title
Stakeholder organization structure with the most positive impact

Input for…
| BMA – A8.1 | BMA – A8.2 | BMA – Business modelling Canvas | PM – A1.6 |

Link to the Business Modelling Approach

Key Partners, Organization, BM

Content

- Map of relevant stakeholders

- Categorization of stakeholders depending on attributes (e.g., Power, Interest, Attitude)

- Plan how to manage stakeholders depending on their attributes

- Knowledge how stakeholders behave to other stakeholders

- Stakeholder organization structure with the most positive stakeholder impact

Goal

- Stakeholders that could influence the project identified

- Integrate supporting stakeholders into the realization of the Use Case

- Difficult stakeholders identified and manage them closely

Check Questions

☐ Which stakeholders have a strong influence in this project and need to be managed? (BMA-A7.3, BMA-A7.4, BMA-A7.5)

☐ Which stakeholders have an interest in how the data is used? (BMA-A7.3, BMA-A7.4)

Deliverable – What has to be achieved?

TUM

Index
BMA – D8.1

Title
Overview of Project Organization

Input for…
BMA – A9.1 | BMA –A9.2 | BMA – Business modelling Canvas

Link to the Business Modelling Approach

Organization, Cost Structure BM

Content
- Project Organization established
- Visualization of the organization by connecting activities, resources, partner & stakeholders

Goal
- Clear view how activities, resources, stakeholders and work together to realize the Use Case

Check Questions
- ☐ How are tasks distributed? (BMA-A8.3)
- ☐ Who is responsible for which task? (BMA-A8.1, BMA-A8.2)
- ☐ Who is accountable for which task? (BMA-A8.1, BMA-A8.2)
- ☐ Who takes care of which data and the data connection? (BMA-A8.1, BMA-A8.2)

Deliverable – What has to be achieved?

Index
BMA – D9.1

Title
Comparison of cost to value created/revenue streams

Input for…
BMA – Business modelling Canvas

Link to the Business Modelling Approach

Business Model

Content

- Comparison of costs to the value created/revenue streams

- Determination of the Break-Even-Point

- Calculation of project profitability

- Visualization of Costs and Value Created / Revenue

Goal

- Profitability result of the business modelling approach

- Shows the potential success/failure of the project

Check Questions

☐ Which activities, resources and partnerships create costs and by what driver are these created? (Jodlbauer, 2020; Nagl, 2018) (BMA-A9.1)

☐ Are all costs incurred defined? (Nagl, 2018) (BMA-A9.1)

☐ When is the Break-Even-Point reached? (BMA-A9.3)

☐ How much does it cost to acquire/generate and process the data? (BMA-A9.1)

☐ How much does it cost to analyze and evaluate the data? (BMA-A9.1)

☐ How much does it cost to provide the data to the customer? (BMA-A9.1)

Deliverable – What has to be achieved?

Index
BMA – D9.2

Title
Total Cost determined to implement and maintain Digital Twin

Input for…
BMA – Business modelling Canvas

Link to the Business Modelling Approach

Business Model

Content

- List of cost factors during the implementation phase and categorize them

- List of cost factors to uphold the Digital Twin and categorize them

- Monetary values based on experience, reference prices or competition assigned to the cost factors

- Summary of total costs

Goal

- Detailed overview on cost factors

- Comparison of cost to revenue -> profitability realizing the Use Case

- Identify cost factors that can be optimized

Check Questions

☐ Which activities, resources and partnerships create costs and by what driver are these created? (Jodlbauer, 2020; Nagl, 2018) (BMA-A9.2)

☐ Are all costs incurred defined? (Nagl, 2018) (BMA-A9.2)

☐ How much does it cost to acquire/generate and process the data? (BMA-A9.2)

☐ How much does it cost to analyze and evaluate the data? (BMA-A9.2)

☐ How much does it cost to provide the data to the customer? (BMA-A9.2)

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