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A. Given problem

Ultimaker is looking for a DFI or SPD (graduate) intern who can:

- Analyse the internal company structure
- Analyse and visualise the product propositions on the roadmap (long, mid and short term)
- Make clear user types, environments and usage scenario’s / journeys.
- Together visualise our growing ecosystem: how product elements relate to which goals / applications.
- Translate all findings into a concept
- Prototype and test the concept (e.g. by facilitate workshops / discussions in the room)

You will be working internally, closely with the product management team.

Preferably you will start in March / April. A monthly compensation is available.

Interested?
Please email your motivation to: h.lub@ultimaker.com
B. Expert interviews

Experts were approached to form a better understanding of the concept of War room. Through phone conversations the experts were interviewed and asked questions led by a short interview guide.

Interview guide

During the interviews a list of questions was used to steer the conversation. However, the interviews often deviated from the prepared questions. The following questions were meant to be answered.

1. What is your role in the company?
2. In what way do you create product strategy?
3. How do you think strategy can be best communicated?
4. How do you involve the end user in your product strategy creation?
5. How are the different departments aligned?
6. How would a structural approach to product strategy alignment look like?
7. What challenges do you foresee in communicating strategy in the future?
8. Are you familiar with the War room concept and how do you interpret it?
9. How would you suggest to use a War room to create alignment?

Participant selection

Participants were contacted based on recommendations by the company coaches. Additional companies were approached in the network of the researcher. Participants preferably work at consultancy and product development companies.

Results

Results were collected in bullet-point format. Selecting the most valuable insights resulted in the folowing list, ordened by expert in random order.

Eric Roskam-Abbing (group director of innovation @ Livework)
- important to have someone manage the room
- represent the strategy, which is changeable, in the room as well
- use artifacts to create clarity
- stakeholder onboarding through leadership and empathy

Willem Boijens (senior director ecosystem design @ Adidas)
- create strategic concepts from experiences instead of numbers
- go to market as fast and as much as possible
- mushroom landscape to build many projects versions works for Adidas
- use expositions to check and selects the concepts
- very important to keep the fire burning
- ingredients of strategy may change, but the core stays the same overall

Vera van Groos (design consultant @ Flatland)
- apply visual thinking to create clarity in complex topics
- process is very valuable to develop the system
- people need incentives to use a different way of working
- the road to understanding is more important than the understanding itself
Cees van Dok (chief product officer @ TomTom)
- appoint leader in order to make decisions
- visuals have a function of capturing ideas and decisions
- important to combine different parts of the company in projects
- red line through the project clarifies the whole
- too many one on one sessions disrupts group validation and discussion

Guido Stompff (creative lead @ Océ)
- problem needs to be superclear
- shared workspace is needed to develop
- representations of what people have in their head
- process is more important than the result because it creates involvement

Dora Panayotova (lead coach for innovation & corporate learning @ wildchild innovations e.V.)
- people need to get inspired by physical objects
- the people should contribute to building the space
- prototyping to make things explicit
- specify rules on the room’s use
- room should be used to think about the future

Mathijs Braamhaar & Jeroen van Eijk (founders & CEO @ Handmade)
- develop artifacts to convince stakeholders and pick out errors
- combining digital and physical represents almost every product nowadays
- remove ambiguity and show barriers
- don’t fill in the blanks yourself

Jo Geraedts (full professor @ TU Delft)
- have someone maintain the room

Main insights
Based on the insights from each expert, three main takeaways were deemed to be most useful and important to the alignment project.
- create a process
- make someone a manager
- communicate through physical objects

For more information, contact the researcher.
APPENDICES

C. **Excursions**

In addition to the interviews with experts, more information was gathered by going on two field trips. The first trip included a masterclass and case at Flatland. The second trip included a business visit of Ultimaker at Handmade.

**Flatland**

At Flatland two separate events took place. First, Flatland organised a masterclass. The masterclass included the practice in making strategies visual. The second included me joining a meeting with an actual client: Stichting Lezen en Schrijven.

In the masterclass the participants were taught that by using simple drawings, it becomes much easier for others to understand your ideas. Remarkable was that the employees at Flatland had developed a certain style, or form language. The same elements popped up everywhere. What makes visualisations powerful is that it enhances collaboration immensely.

Figure 1-1. Masterclass at Flatland

The masterclass started of by having each person explain him- or herself through visuals on large Post-its. Next activity was a crash course in drawing abstract things. The afternoon was filled by a case study in which teams of participants were coached to produce a convincing visual to support a presentation at the end of the day for the company.
The case at Flatland was not very different. Main insights are based on the tools used during the meeting. A few canvases were used to structure the discussions. One of the important insights is to use diverging and converging activities. At first the team explores several options. Then, a choice is made to create focus and priorities. Another insight is to make the visiting party owners of their own strategy. It is much more powerful to work with people who are engaged and who have ownership of the final result, because it increases the chances that they will actually value the outcome and use it.

Preceding to the meeting, Flatland’s employees constructed a planning and prepared the materials. The meeting started with an individual question about what everyone’s goal with the meeting was. After that the participants began by filling a kick-off canvas, a tool to discover what the main goal was and how that was going to be realised. Goals can only be achieved by acting on them and therefore a washing-line method was used to produce a list of action points and arranging them on importance. In the end of the meeting a proposal for a visual was made and the visiting organisation left happily.

Figure 1-2. Company visit at Handmade
Handmade
The trip to Handmade had different interests. Since more people from Ultimaker joined on the trip it was a business visit as well, next to the exploration of war room insights. Main findings can be found in the expert interview appendix. What was striking about the visit, apart from the interview, was the way in which they approached projects. Handmade believes small teams work better. The office was decorated with that in mind to provide small teams with the tools to quickly build prototypes or mock-ups early in the process. Employee interviews
D. Employee interviews

In the discover phase of the project a number of employees were interviewed to gain insights into the company, the problem, and the working methods. Topics that were discussed included the company vision, the company's product strategy, the corporate culture, workflows surrounding product strategy, collaboration with other employees, level of involvement, and the future of the company regarding product strategy.

To obtain information, interview guides and a journey map canvas were built. The second used in a later stage to gain more in depth knowledge about the working methods relevant to product strategy alignment.

Goals of the interviews

Goals for different parts of the company were formulated.

Strategy

- How they manage the strategy
- How they experience the transfer of strategy to others
- What they think of others’ input
- How they try to improve
- What barriers they run into
- With whom they communicate the strategy

Technical Development

- How they experience the strategy management
- What they think of the collaboration with PM
- How they collect information about the strategy

Project Management

- How to structurally integrate strategy in the projects
- How to align product strategy among colleagues
- What they notice about other projects and how they overlap
- How they can collect information about the strategy

Marketing

- What the touch points with the strategy are
- How they influence the strategy
- What feedback they provide
- How they can collect information about the strategy

Interview guides

Interview guides were based on the position of the employee in the company. Strategy owners were asked slightly different questions than the strategy translators. The interviews were constructed according to the Path of Expression (Sanders and Stappers, 2012).

What do you do?

1. role: Can you tell me more about your role in the company?
2. activities: Can you explain what your main responsibilities contain?
3. strategy: What is the strategy of Ultimaker in your own words?
4. capture: How do you document strategy concerning information?
5. vision: What part of the vision do you think is most important and how is that evident in your work?

How do you experience your work?

6. atmosphere: How would you describe the culture at Ultimaker?
7. transition: How do you experience the transition to a more professional work environment?
APPENDICES

8. inspire: How do you get inspired?
9. voice: How are you able to voice your opinions?
10. value: What values do you find important in your work?
11. collaborate: What do you experience collaborating with your colleagues?
12. big picture: How do you stay updated on other projects?
13. progress: How do you experience the channels through which you communicate?
14. friction: Did you ever experience friction in working with the strategy and how does that manifest?

How do you see the future?

15. envisioning: How would you improve the communication of strategy?
16. strategy: How would you like to include strategy in your work?
17. fit: How do you think the structuring of strategy will fit in with the rest of the company practices?
18. feedback: In what way would you like to receive feedback about your progress?
19. other: Do you have any questions or comments?

Additional questions were asked based on the three groups mentioned in the product strategy chapter:

Owners

20. strategy: How do you go about creating the strategy?
21. struggles: What problems do you run into in developing strategy?
22. struggles: What barriers can you identify in communicating the strategy?
23. others: How do you include other opinions in the strategy?

Translators

24. transfer: How do you make sure the strategy is properly executed?

Receivers

25. sense: How do you make sense of the product strategy and include it in your work?

Participant selection

Participant selection was based on recommendations by the company mentors. One of the criteria was that people from different parts of the company were contacted that are in some way connected with the product strategy. In total a number of thirteen people were interviewed.

Executing the interviews

The interviews were audio recorded and notes were being taken during the meeting. Afterwards interviews were listened to and extended note taking took place, resulting in lists of bullet points with interesting comments deemed insightful to the researcher.

Results

Notes from interviews were collected in bullet-point format after revisiting the audio files of each interview. Applying the same filter to the notes as with the expert interviews resulted in a selection of interesting quotes. After clustering the following categories were discovered (figure 1-4).
Main insights
From the clusterings, problems have been distilled in appendix E.

**Vision & Strategy**
- make strategy tangible/visible
- combination of market pull and technology push
- synergise the different roadmaps

**Access**
- make information meaningful
- informal place to easily discuss
- central information point
- low threshold

**Resources**
- create knowledge map
- efficiency collaboration through team composition

**Planning**
- work from launch to launch
- direct schedule alignment across departments
- prevent project delays

**Culture**
- silos bridged by engagement
- manage expectations
- informal, flat structure
- need for freedom

**Performance**
- ensure holistic product system
- clarify feedback loops
- research technical aspects
- overview of KSPs

**Collaboration**
- validating arguments
- create multidisciplinary activities
- mapping links between departments
- monitor competencies

**Decision Making**
- collect relevant information
- reduce number of changes
- balance input from business, technology, and user
- identify key decision makers
- evaluate decision risk

**Alignment**
- short presentation events
- easy interpretation of project status
- reflecting on projects and activities in bigger picture
- creating a shared language
- manage expectations
- involve the right people
- fit different practices together

**Feedback**
- regular feedback moments
- face to face feedback
- reward system
- systematic processing of feedback

**Responsibility**
- clear responsibilities assigned
- knowing whom to contact
- multidisciplinary responsibilities

**Competition & External**
- partnership exploration
- risk assessment
- understand playfield

**User & Context**
- streamline user input
- validate project value based on user
- involve consumer in all stages

**Structure**
- making requirements explicit
- create framework of connections
- balance processes and freedom

**Figure 1-3.** Clustering interview data

**Figure 1-4.** Overview of interview data
E. Identified problems

By analysing interviews and getting a feel for the environment, a list of problems were uncovered. The list includes problems experienced by few, to problems mentioned by most not in any particular order. The main three problems are described in the report.

Structure

- difficult to onboard people
- unclarity about structure
- no clear development program
- hard to bring the right people together
- organisational developments are happening
- unclear how to document
- many decision changes
- not many structures in place
- different documentation systems

Vision & strategy

- not much awareness of other projects
- not always same priorities
- unclarity of vision and strategy
- unclarity of the end goal
- losing essence in development
- difficult to create shared understanding
- unclarity about context of projects

Interrelations

- unclarity about roles
- unclarity about interrelations
- feeling of silos
- noticing people work towards different goals
- culture change
- differences in ways of working
- hierarchical struggles
- not much communication between departments

Feedback

- feeling of not being heard
- feeling of not feeling safe to voice opinion
F. Product strategy tools

Product strategy tools consist of software tools that structurize project information. In this case the focus is on the structures. At Ultimaker the department responsible for the product strategy is Product Management. Main goals of Product Management are the tracking of the backlog, overviewing projects’ progress, and the management of the roadmaps. To do so many templates can be applied, central examples being:

- Business Model Canvas (Osterwalder and Pigneur, 2010)
- Lean Canvas (Maurya, 2012)
- Value Proposition Map (Osterwalder and Pigneur, 2014)
- Product Canvas (Pichler, 2012)
- Project Canvas (Kalbach, 2012)
- Team Canvas (Ivanov and Voloshchuk, 2015)
- Role Model Canvas (Botta, 2017)
- Design Brief (ClearDesignUK, n.d.)
- Product Brochure (Over the Fence, 2016)
Figure 1-5. Business Model Canvas (Strategyzer, 2010)
**Product Strategy Canvas**

**VISION**

*This is the lofty, futuristic goal for where your company or division is heading. Think long term.*

| In | will be | Time frame | Company, division | Vision statement |

**CHALLENGE**

*The first big goal to tackle on your way to the vision. Think in terms of user journeys, ideal states, objectives and KPIs that relate to the product lifecycle.*

| In order to reach our vision, we need to | measurable objective | by | time frame |

**TARGET CONDITION**

*This is a smaller, measurable objective that teams can start exploring today.*

| In order to reach our Challenge, we first need to | measurable objective |

**CURRENT STATE**

*What’s the status today as it relates to the target condition?*

| After measuring, we know our current state is | measurements of current state |

---

**Figure 1-6.** Product Strategy Canvas (Produc, 2016)

To decide on a template that creates an overview of projects an iteration was made based on product strategy templates (e.g. figure 1-5 and 1-6). This iteration will become relevant in the conceptualisation stage of the report.

**Figure 1-7.** Iteration on a project overview template
G. Stakeholders

Although many employees were interviewed, clear users were not identified. What did result from the interviews were a large number of stakeholders that are closely involved in Ultimaker's product strategy. For the course of this project these stakeholders were identified and consulted when necessary, but in the end the target groups were divided into three main groups: product strategy owners (blue), product strategy translators (green), and product strategy receivers (red). The different stakeholders are described in figure 1-8.

Figure 1-8. Iteration on a project overview template (1/2)
Function: PM hardware
Activities: Responsible for the hardware roadmap.
Strategy: ...

Function: System architect
Activities: Responsible for advising HW developers on architectural matters.
Strategy: Being part of HW management joins in the discussions concerning HW operations.

Function: Product owners
Activities: Responsible for the SW products and their developments. Managing the team members.
Strategy: Functions as translator and mediator between PM and the development teams.

Function: Department manager
Activities: Responsible for the management of the hardware department. Ensuring projects are provided for.
Strategy: Being member of the MT the manager ensures that HW is working in the proper direction.

Function: Project leaders
Activities: Responsible for the HW products and their developments. Managing the team members.
Strategy: Function as translator and mediator between PM and the development teams.

Function: Team members
Activities: Responsible for the execution of the projects. Working on subtasks in collaboration with other members.
Strategy: Receiving design requirements from POs/PLs and providing feedback on their feasibility.

Figure 1-9. Iteration on a project overview template (2/2)
**H. Journey mapping sessions**

The journey mapping sessions were conducted to study communication concerning product strategy and alignment.

**Strategic meetings**

In consultation with the company six key strategic sessions were identified as can be seen in figure 1-10.

**Tools**

During the interviews with key stakeholders of the meetings two tools were used. First a journey map canvas (figure 1-11) was constructed to guide the discussion through the strategic meeting. Second was a set of cards (figure 1-12), developed on basis of the employee interviews, that was used to highlight what the most important topics were.
<table>
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<tr>
<th>Stages</th>
<th>work</th>
<th>prepare meeting</th>
<th>meeting</th>
<th>post meeting</th>
<th>work</th>
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<tbody>
<tr>
<td>Activities</td>
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<td>Actors</td>
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<td>Goals</td>
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<td>Touchpoints</td>
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<td>Emotions</td>
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<td>Thoughts</td>
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<td>Information</td>
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**Figure 1-11.** Journey map canvas

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**Figure 1-12.** Set of value cards
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A guide was constructed to systematically fill the template and use the cards (figure 1-13).

Journey maps
The journey maps were conducted individually with each of the stakeholders. During the meeting the journey map was filled with Post-its (figure 1-14).

<table>
<thead>
<tr>
<th>steps</th>
<th>time</th>
<th>flow</th>
<th>supportive questions</th>
<th>notes</th>
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</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
<td>explanation of the goal of the project, how the project arrived at this point, why this meeting is important, how the meeting will look like, and what will be done with the results</td>
<td>use journey map</td>
<td></td>
</tr>
<tr>
<td>timeline</td>
<td>10</td>
<td>using the journey map to make a distinction between the different tasks, recollecting most recent meeting, how does this compare to other meetings</td>
<td>how did your last meeting look like in chronological order? use journey map</td>
<td></td>
</tr>
<tr>
<td>goals</td>
<td>5</td>
<td>what is reason behind the meeting</td>
<td>what is it that needs to be accomplished? use journey map</td>
<td></td>
</tr>
<tr>
<td>actors</td>
<td>5</td>
<td>identify key actors in achieving the goal</td>
<td>whom do you collaborate with? use journey map</td>
<td></td>
</tr>
<tr>
<td>information flow</td>
<td>5</td>
<td>exploring what information is</td>
<td>what do you bring with you? what do others bring? use journey map</td>
<td></td>
</tr>
<tr>
<td>topic importance</td>
<td>5</td>
<td>give participant a couple of minutes to consider the different topics, ask him to pick the top five most important ones and order them on importance</td>
<td>use of cards</td>
<td></td>
</tr>
<tr>
<td>topics</td>
<td>10</td>
<td>discover why these topics are most important for the participant, how they are evident in his current meetings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ideal situation</td>
<td>10</td>
<td>how would you envision an ideal meeting</td>
<td>when would be ideal times to hold such a meeting? what should be talked about? how would you like the meeting to be supported? where do you think would be the most appropriate place to hold such a conversation?</td>
<td></td>
</tr>
<tr>
<td>closing</td>
<td>5</td>
<td>revise what has been said, ask if there is anything else that needs to be mentioned, thank participant for their insights</td>
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</table>

Figure 1-13. Journey mapping guide

Figure 1-14. Conducting the journey mapping sessions
Strategy Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>work</th>
<th>prepare meeting</th>
<th>meeting</th>
<th>post meeting</th>
<th>work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>- co-create high-level questions - deciding on aspects to focus on</td>
<td>communicate main idea to different people - define large trend through validating with people - deciding on what needs to be done to target the strategy choice - create structure in the story - create visuals to communicate</td>
<td>on-airing of board</td>
<td>- sign off of strategy - sharpen proposition</td>
<td>work</td>
</tr>
<tr>
<td>Actors</td>
<td>- CEO - CFO - internal stakeholders - Portfolio Manager - external partners</td>
<td>- Portfolio Manager - external partners</td>
<td>- Portfolio Manager - external partners</td>
<td>- external partners</td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>- prepare presentations - gain support - breaking status quo - convincing others of direction</td>
<td>- changing paradigms</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touchpoints</td>
<td>- walkways</td>
<td>- presentation</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotions</td>
<td>- primary - disagreement</td>
<td>- lonely - experience resistance - difficulty in translating into</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts</td>
<td>- ideas ripen with time - everybody can propose ideas and dates</td>
<td>- renewed for a team</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td>- complete picture</td>
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</table>

Portfolio Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>work</th>
<th>prepare meeting</th>
<th>meeting</th>
<th>post meeting</th>
<th>work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>- meet with external partners - collect ideas - gather customer input - report on workshops</td>
<td>- visualise ideas (positive, negative) - check ideas with stakeholders (MT) - identify key stakeholders from different stakeholders</td>
<td>1. introduce strategy 2. explain research process 3. share results from research 4. define customer needs 5. present product proposal 6. elaborate business case</td>
<td>- reserve space to keep &amp; update visualisations of strategy</td>
<td>- keep making changes to concept</td>
</tr>
<tr>
<td>Actors</td>
<td>- board - MT - SPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>- discover opportunities - research options - ensure completeness of information - make ideas credible</td>
<td>- land ideas - buy in - sharpen propositions - make proposals choices - validate propositions</td>
<td>- guest concept value</td>
<td>- proceed with proposition creation</td>
<td></td>
</tr>
<tr>
<td>Touchpoints</td>
<td>- meetings</td>
<td>- face to face interaction</td>
<td>- powerpoint - portfolio - mockup</td>
<td>- walkways</td>
<td>- responsible</td>
</tr>
<tr>
<td>Emotions</td>
<td>- control</td>
<td>- customer - support</td>
<td>- energetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts</td>
<td>- user perspective validation - balance business technology human factors - ensure people - manage perspectives &amp; priorities - test initial insight creation</td>
<td>- each people - original arguments - that make the case should remain if we need to be kept in the loop</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>Tools</td>
<td></td>
<td></td>
<td>- heartbeats in projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td>- market analysis - customer hassles - proposition content - validation criteria - UI/UX system</td>
<td></td>
<td></td>
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</tbody>
</table>

Program Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>work</th>
<th>prepare meeting</th>
<th>meeting</th>
<th>post meeting</th>
<th>work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>- update status</td>
<td>- manage tasks - main gaps</td>
<td>- update of planning - what is needed when planning is not met - represent interests</td>
<td>- inform MT</td>
<td>- gather sufficient information</td>
</tr>
<tr>
<td>Actors</td>
<td></td>
<td></td>
<td>- very big meetings - project leaders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>- delegate responsibilities</td>
<td>- integral leadership - create clarity about targets - focus on priorities</td>
<td>- refinement - account for mandate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touchpoints</td>
<td>- dashboards - google docs</td>
<td>- planning</td>
<td>- email</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotions</td>
<td>- intrinsically experience projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts</td>
<td>- understand what happens below dashboard level</td>
<td>- transparency - role division</td>
<td>- uncertain communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools</td>
<td></td>
<td></td>
<td>- planning - issues - risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
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</tbody>
</table>

Technology Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>work</th>
<th>prepare meeting</th>
<th>meeting</th>
<th>post meeting</th>
<th>work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td></td>
<td></td>
<td>- quantify roadmap specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actors</td>
<td></td>
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<td></td>
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<tr>
<td>Goals</td>
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<tr>
<td>Touchpoints</td>
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<tr>
<td>Emotions</td>
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<tr>
<td>Thoughts</td>
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<tr>
<td>Tools</td>
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<td>Information</td>
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</tbody>
</table>
### Program Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>Activities</th>
<th>Actors</th>
<th>Goals</th>
<th>Touchpoints</th>
<th>Emotions</th>
<th>Thoughts</th>
<th>Tools</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vision &amp; Strategy</td>
<td>clarify problem - clarify chance</td>
<td>stakeholders</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>2. Decision Making</td>
<td>gather stakeholders - clarify meeting goals</td>
<td>project leaders</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>3. Responsibility</td>
<td>evaluate improvements for next meeting</td>
<td>MT</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>4. Collaboration</td>
<td>plan, planning</td>
<td>multidisciplinary teams</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>5. Information Access</td>
<td>- evaluate improvements for next meeting</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
<td></td>
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</tr>
</tbody>
</table>

### Technology Management

<table>
<thead>
<tr>
<th>Stages</th>
<th>Activities</th>
<th>Actors</th>
<th>Goals</th>
<th>Touchpoints</th>
<th>Emotions</th>
<th>Thoughts</th>
<th>Tools</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competition &amp; External Drivers</td>
<td>- competitiveness, - competition, - competition</td>
<td>- wall of planning, - presentation, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Vision &amp; Strategy</td>
<td>clarify problem - clarify chance</td>
<td>stakeholders</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>3. Feedback</td>
<td>gather stakeholders - clarify meeting goals</td>
<td>project leaders</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>4. Collaboration</td>
<td>evaluate improvements for next meeting</td>
<td>MT</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
<tr>
<td>5. Information Access</td>
<td>plan, planning</td>
<td>multidisciplinary teams</td>
<td>sell ideas, make changes</td>
<td>work</td>
<td>- presentations, - wall of planning, - discussion of ideas</td>
<td>- conversations - post its - digital designs</td>
<td>- agenda not always clear - keep topic small and sharp</td>
<td>- planning - issues - risks</td>
</tr>
</tbody>
</table>
Meeting structure
Although meetings are extensively present in Ultimaker, it is necessary to explore the meetings. During the discover phase, journey mapping sessions were conducted in which strategy meetings were analysed. The results of the meetings showed overlap between them and could be combined into a rough overview (see figure 1-15).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define goal</td>
<td>Gather participants</td>
<td>Collect information</td>
<td>State agenda</td>
<td>Status update / share information</td>
<td>Propose ideas</td>
<td>Identify challenges &amp; provide solutions</td>
<td>Decide on plan of action</td>
<td>Close meeting</td>
<td>Share agreements</td>
<td>Evaluate meeting</td>
<td>Plan next meeting</td>
</tr>
<tr>
<td>PM / PL</td>
<td>PM / PL</td>
<td>PM &amp; PLs / PL &amp; TM</td>
<td>PM / PL</td>
<td>PLs / TM</td>
<td>PM &amp; PLs / PL &amp; TM</td>
<td>PM &amp; PLs / PL &amp; TM</td>
<td>PM &amp; PLs / PL &amp; TM</td>
<td>PM / PL</td>
<td>PM / PL</td>
<td>PM / PL</td>
<td></td>
</tr>
<tr>
<td>Track Calendar ?</td>
<td>PPT / vocal</td>
<td>PPT / visuals</td>
<td>PPT / visuals</td>
<td>PPT / visuals</td>
<td>Vocal</td>
<td>Vocal</td>
<td>Vocal</td>
<td>Mail</td>
<td>Text</td>
<td>Calendar</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1-15. Ultimaker meeting process

The meeting structure presented in figure 1-15 is not tuned to facilitate the creation of boundary objects. A well-known method that does so is the LEGO Serious Play method (LEGO Group, 2010). They describe a three stage process consisting of challenge, build, and share. Adjusting this process to fit Ultimaker’s meeting structure results in the following scheme in figure 1-16.

Figure 1-16. Joint meeting structure
l. Ideation

Some of the ideation methods deployed are gathered here.

Inspiring stories

Having read the experts input regarding experiences, another perspective can be obtained when looking at other ways of meeting. Therefore inspiring stories were conducted with other students to think about gatherings or meetings in general. These situations resulted in some general characteristics surrounding those meet-ups that could be applied to the War room project as well (figure 1-18 on the next page).

During the group sessions (see also figure 1-17), when people were asked to draw and describe their most favourite meeting, they mentioned very differing situations.

Although the situations were different from each other, the dialogues following each person’s explanations contained similar characteristics. Having a shared activity, focus directed towards a central focal point, the feeling of being safe, and having empathy for others were the main characteristics that could be applied to almost any situation.
Figure 1-18. Inspiring stories
How to initiate purpose?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>standard program</td>
</tr>
</tbody>
</table>

How to gather participants?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>ask in person</td>
</tr>
</tbody>
</table>

How to create boundary objects?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>building bible</td>
</tr>
</tbody>
</table>

How to share findings?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>present</td>
</tr>
</tbody>
</table>

How to make decisions?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>vote count</td>
</tr>
</tbody>
</table>

How to save information?

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>generic forms</td>
</tr>
</tbody>
</table>
How Tos
How Tos were created on several instances. Here the latest of the How Tos are displayed in a Morphological Chart (figure 1-19). The How Tos reflect parts of the process chosen in light of this project. Based on the How Tos ideas were created shown in figure 1-20.
APPENDICES

J. Tests
In this entry the tests are gathered. Early in the process small tests were conducted to explore several ways of facilitating and order the meetings. Later on more focus was paid to the workings of building blocks and templates.

Collaboration test
Research questions:

• What topics need to be discussed to create alignment?
• How much guidance do participants need?

Execution:
One of the first tests was focused on providing a structure to the meeting. The idea was to see if part of the standard Ultimaker meeting structure could be applied in an orderly fashion. Therefore a template with ideas, challenges, and plans was made.

Results:

Figure 1-21. Collaboration test
Topics that need to be discussed vary greatly between meetings. Therefore a preference for multiple templates is required or a focus on a certain goal needs to be determined.

A template does create a lot of guidance. By focusing on the topics, participants are directed towards creating content aimed at the topics.
Therefore the template can be considered a leading element in the discussion.

After the meeting participants mentioned that they especially valued the insights in each other's point of view. However, it was hard for them to create focus on what had the most priority. Therefore more information or indicators were necessary to make proper judgements.

**Diverging test**

Research questions:

- Do diverging and converging activities help in creating alignment?
- What template structures are desired?

Execution:

The focus was on the generation of a template that allowed for decision making processes. A subgoal, which will be clear in the next test, was to see if the template could be resumed in a later meeting. So that when a meeting was closed and resumed a different time, that the information would be relevant and easily reviewable. What was added was a point system in which participants could indicate which topics they found most important at the end of the meeting.
Results:
The diverging activities created a lot of engagement. Everybody had opportunity to suggest ideas and opinions. Besides, by creating an overview on the wall it was clear to everybody what the options were, although they sometimes needed more explanation.

The template, consisting of areas with different topics, was appropriate for the goal of the meeting. However, it was clear that this was a strategy creation session, limiting the template’s effectiveness for alignment purposes in a later stage of the process.

What resulted from the meeting was a positive feedback on the way in which choices could be made. After making a visual overview of the possibilities it was much easier to indicate what should get priority.

Recollection test
The recollection test was about evaluating a template. It was also a continuation of the previous test, in which input for the template was generated. At the start only the prioritised information was present. However it turned out to be insufficient. Still, prior explorative knowledge was requested to recall why certain choices were made.

Research questions:
• What background information is needed to continue the meeting?

Execution:
Prior to the meeting a selection of the information, generated in the previous meeting, was made. By presenting only the outcome of the last meeting the participants were asked to continue to fill the template.

Results:
At the start of the meeting a short recap uncovered the need for more information from the previous meeting. Only showing the results wasn’t enough. Why they had made this choice was being called into question and therefore more information was needed.

Focussing the attention on the template created little distraction. This ensured people kept paying attention. After a while, the meeting lasted for four hours, the participants seemed to lose their energy.
**Tuning tests**

The tuning tests are already described in the iteration chapter. The building blocks and templates have been developed, which we will elaborate on.

To give shape to the building blocks, an inventarisation of the topics was needed. Therefore meetings in which the progress of projects was discussed were attended to discover the topics. The results are captured in the following list:

- hardware, software, services, materials, personas, partonas, applicatas, environments, stakeholders, channels, markets, facts, principles, developments, trends, needs, barriers, values, money, people, time, priority, actions, departments, research, and technology.

For each topic a corresponding icon was found. The items were laser cut as can be seen in figure 1-24 and 1-25 to create physical objects.

As the product strategy chapter mentioned, many templates try to describe projects. However, for this test the business model canvas was selected because it is a familiar template for the participants. To create engagement from all participants a round format constructed (figure 1-25).

![Lasercutting](image-url)
Figure 1-25. Business Model Canvas template (Osterwalder and Pigneur, 2010)

Figure 1-26. Building blocks
K. Building blocks
L. Meeting topics

Two meetings were attended with special attendance for the aspects. From an observer role the discussion was followed. From the discussions a list of aspects was created that reflect a number of strategic topics being discussed. Together with prior knowledge and consult with the company coach a complementary list is presented below.

- hardware
- software
- services
- materials
- personas
- partonas
- applicatas
- environments
- stakeholders
- channels
- markets
- facts
- principles
- developments
- trends
- needs
- barriers
- values
- money
- people
- time
- priority
- actions
- departments
- research
- technology
- links (thread/lines)
M. Concept selection

The concepts, Transparent Templates, Battlefield, and Serious Play, are evaluated based on the criteria mentioned earlier in the define phase. The concept which scores best on the criteria is selected for further development.

The criteria, in order of importance, are listed below:

- highlights interrelations
- communicates the shared goals
- clarifies product strategy
- creates engagement
- effective usage of boundary objects

The concept are rated on a 4-point scale and therefore definitions of the scales are described in table 10-1.

Based on table 10-1 a Harris Profile was constructed in which a summary of the concept ratings are displayed in a visual way. The Profile can help to create an overview of which project is most viable.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Interrelations</th>
<th>Shared Goals</th>
<th>Product Strategy</th>
<th>Engagement</th>
<th>Effective Usage of Boundary Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>Interrelations are not clear. Stakeholders are not aware of each person’s responsibilities and connections to each other.</td>
<td>Shared goals not clear. Stakeholders have no awareness of what the goals are and are not evident.</td>
<td>Product strategy is not clear. Stakeholders have no knowledge about the different components of the product strategy.</td>
<td>Engagement is not evident. Tasks are managed as one-man jobs.</td>
<td>Building blocks are not relevant. Using them doesn't add any value.</td>
</tr>
<tr>
<td>-1</td>
<td>Interrelations are somewhat clear. It costs stakeholders a lot of effort to find out the connections between their work and others.</td>
<td>Shared goals are somewhat clear. Stakeholders have an idea of the shared goals in their mind.</td>
<td>Product strategy is somewhat clear. Stakeholders have an idea of the different strategic components.</td>
<td>Engagement is somewhat accounted for. The opinions of others are taken into consideration, but ownership is not shared.</td>
<td>Building blocks offer some kind of support. However, the blocks still cause confusion.</td>
</tr>
<tr>
<td>1</td>
<td>Interrelations are clear. However, connections are not easy to identify in the tangible systems models.</td>
<td>Shared goals are clear. The goals are visualised in tangible systems models, but are hard to interpret.</td>
<td>Product strategy is clear. Strategic components are visualised in systems models, but the system of components is not clear.</td>
<td>Engagement is created. Ownership is shared because people are involved in the product strategy creation process.</td>
<td>Building blocks are of some use. The blocks represent information well and focus discussions.</td>
</tr>
<tr>
<td>2</td>
<td>Interrelations are clear. Stakeholders can easily detect them in the systems models. The relations between the parts are visualised.</td>
<td>Shared goals are clear. The goals are clear to all participants and clearly visualised.</td>
<td>Product strategy is clear. Strategic components are visualised in systems models. The stakeholders are able to interact with different compositions, creating a complete picture.</td>
<td>Engagement is created. Ownership is shared because people are actively involved in the creation of product strategy.</td>
<td>Building blocks are useful. The blocks represent information well and are easy to compose. The discussions are directed by the building blocks and their compositions.</td>
</tr>
</tbody>
</table>

Table 1-1: Criteria scale definitions