

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name Arkes

initials JR given name Julie Rebecca

student number _____

street & no. _____

zipcode & city _____

country _____

phone _____

email _____

Your master programme (only select the options that apply to you):

IDE master(s): IPD Dfi SPD

2nd non-IDE master: _____

individual programme: - - (give date of approval)

honours programme: Honours Programme Master

specialisation / annotation: Medisign

Tech. in Sustainable Design

Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair dept. / section:

** mentor dept. / section:

2nd mentor

organisation:

city: country:

comments (optional)

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

Procedural Checks - IDE Master Graduation

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Elvin Karana

date

- -

signature

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: EC

Of which, taking the conditional requirements into account, can be part of the exam programme EC

List of electives obtained before the third semester without approval of the BoE

YES all 1st year master courses passed

NO missing 1st year master courses are:

name

date

 - -

signature

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name

date

 - -

signature

Creating a web-based platform for living textiles

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

 start date 10 - 03 - 2021
08 - 11 - 2021

end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Following a report of MCKinsey 2021 (Sneader & Singhal) the covid-19 situation is contributing in re-shaping the global economy and creating imperative for companies to reconfigure their operations. Within this scenario also for the fashion industry the necessity to innovate is becoming more evident. Firstly nowadays the textile industry is responsible for producing 1.2 billion tonnes of greenhouse gas emissions annually (MacArthur, 2013). Therefore, the main focus should be creating sustainable change. This can be done by; one; produce what we sell, two; make the system circular by keeping used textiles in the loop again and again and thirdly look at new textiles that are circular themselves. Secondly according to Lay (2019) consumers are increasingly making use of digital channels to be better informed, more selective and take more care about the sustainability and safety of the goods they buy and own. Such shift towards the use of digital channels particularly increased the past year due to social distancing measures as a consequence of Covid-19 (Shetch, 2020).

In order to move towards a more circular future for the fashion industry, the complex interaction between production, communication and consumption of textiles should change. This creates an opportunity to combine biodesign, digital communication and consumer engagement to revolutionize the fashion industry. To facilitate this revolution, firstly the rise of bio derived materials for this industry that are not harmful for people and the environment could be valuable. Secondly platforms capable of properly introducing such materials and engaging the consumers in taking part into the circular process can form an example.

Examples of bioderived materials for the fashion industry are biodesigned textiles. Living organisms (i.e., algae, bacteria and fungi) are used in biofabrication processes as building blocks to develop textiles and fabrics that are non-toxic and compostable (D'Olivo & Karana, n.d.). Biodesigned textiles further differentiate according to their 'livingness' aspect (Karana et al., 2020), namely the characteristic for which the living organisms used in the biofabrication process become inert or are kept alive in the material outcome. Examples of materials where the living organisms used in the process become inert are: BrewedProtein™ by Spiber where fermentation of bacteria with other natural ingredients is used to produce silk proteins that are later turned into fibers, and Mylo™ a type of mycelium leather which is based on mycelium cells grown on beds of renewable organic matter. Instead, an example of a 'living' biodesigned textile is Biogarmentry designed by Roya Aghighi in collaboration with University of British Columbia and Emily Carr University. Biogarmentry consists of a type of single-cell green algae that is spun together with nano polymers thereby the first non-woven living textile that is capable of photosynthesis is created. The design aims to change the relationship to our clothing from consumption-oriented habits towards caring behaviour. Communicating through online platforms such as websites can have an important role in enhancing the adoption of such materials by triggering consumers awareness (D'Souza et al., 2015) and acceptance (D'Olivo & Karana, n.d.). Finding new ways of creating material narratives through such media can specifically influence: i) consumers' willingness to purchase biodesigned textiles, ii) the length of the life cycle of the biodesigned textiles (e.g., through repairing or reusing garments), and iii) the possibility of recycling those materials when are no longer reusable (Dahlbo et al., 2017).

space available for images / figures on next page

Personal Project Brief - IDE Master Graduation

introduction (continued): space for images

Design methods and tools selected for the project

- The Material Framing framework (D'Olivo & Karana, n.d.) is chosen to describe the biodesigned textiles under study following the three categories of material origins, fabrication processes and material outcomes.

- The Material Driven Design (MDD) method (Karana et al., 2015), is chosen to envision the material experience that should be provided through the web-site platform. In Figure 1 the model is detailed.

- Research through Design (RTD) approach because the act of making prototypes helps to face several confrontations, and makes it possible to test with users in a early phase of the process.

To build a narrative the web based platform should be a symbioses of form and content (Sanchez-Lopez et al., 2020) and therefore consist of the following elements ;
 Form; User experience, (videos, images etc.), Sharing with others, (Wolmann, 2021) Interactivity, (Sanchez-Lopez et al., 2020)
 Content; Authority, purpose,evidence based information, currency, (Wolmann, 2021) vocabulary, (Sanchez-Lopez et al., 2020)

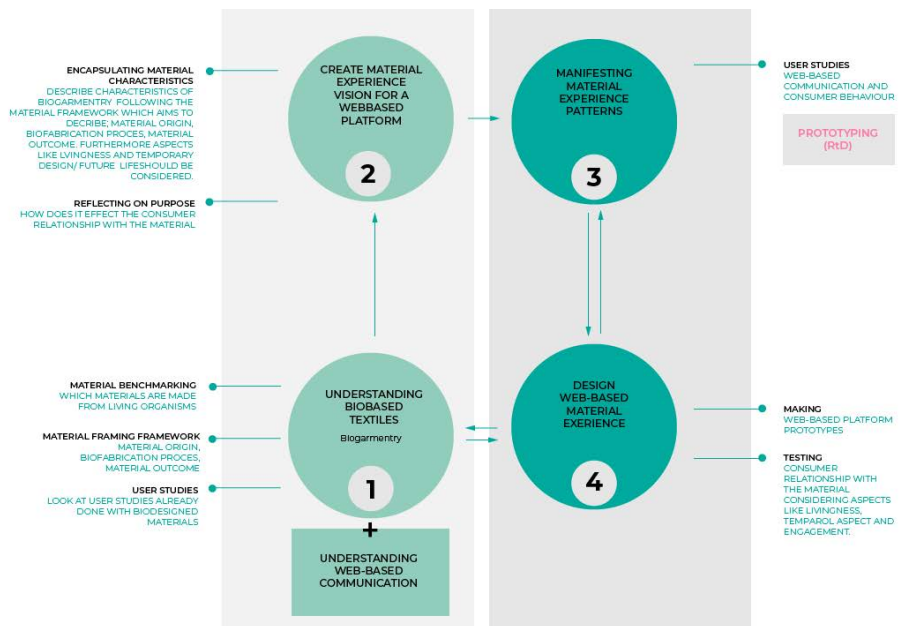


image / figure 1: Application of the Material Driven Desig Method (MDD) (Karana, 2015) to address the project's goal.

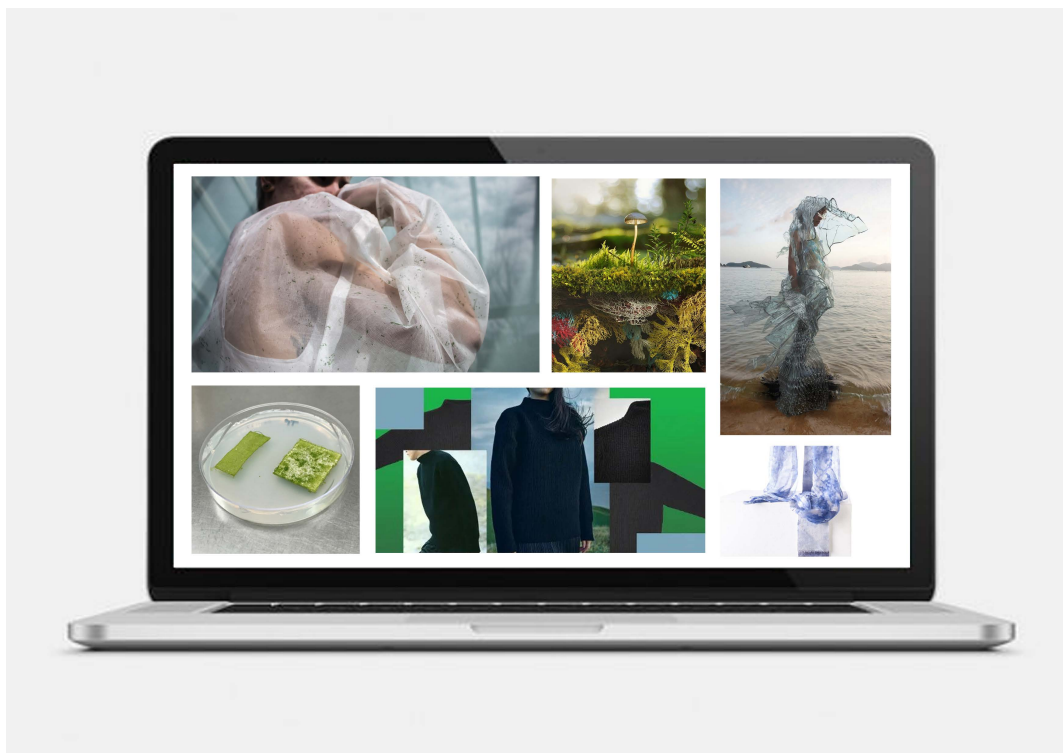


image / figure 2: Moodboard; Envision a world where biodesign revolution is supported by digital storytelling

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Despite the great interest in the use of bio-designed materials, they nevertheless occupy a smaller market share than wished for. (D'Olivo & Karana, n.d.) This can be due to the fact that the adoption of a new material within society takes about 20 years (Maine et al, 2000). An opportunity to accelerate the adoption of new materials within society could be found in the use of web-based platforms. However, an analysis done by D'Olivo & Karana (n.d.) confirms that the traditional online tools remain inadequate to capture and communicate the qualities of novel material which are still unfamiliar to society.

Therefore, to design a web-based platform with the aim to properly introduce biodesigned textiles, trigger the long-term engagement of consumers and consequently improve circularity; the project will be structured according to the following research questions and sub-questions:

R.Q.: How should biodesigned textiles be introduced and communicated to society through web-based platforms?

1. Which biodesigned materials from living organisms (biodesigned textiles) are available for the fashion industry? 1.1

What are the properties and qualities of biodesigned textiles from living organisms? 1.2. How is their 'livingness' expressed and how does their 'livingness' contribute to a circular economy? 1.3 How can the materials' 'livingness' and its contribution to circular economy be communicated?

2. How should a web-based platform for biodesigned textiles look? 2.1 What elements would better support the communication of properties, qualities and livingness of such materials? 2.2 How could these elements be used to create a 'circular' material narrative for biodesigned textiles?

3. How can a web-based platform inform, engage and support consumers in maintaining a long-term relationship with biodesigned textiles to contribute to circular economy? 3.1 Do consumers prefer an active or passive engagement? 3.2. Do consumers prefer a personal-vs. shared experience?

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

I want to take the revolution of biodesigned textiles made from living organisms to the next level by providing a _____ web-based platform that stimulates adoption of these materials within our future society.

This web-based platform should be able to:

-[1] communicate the 'livingness' of biodesigned materials which might enhance the appreciation of these materials and help their seamless integration in our daily life (D'Olivo & Karana, n.d.);

-[2] communicate the 'temporal aspect' of biodesigned textiles to inform consumers about the extended lifespan and the future life within our circular economy;

-[3] engage the consumer to accelerate the adoption of these materials.

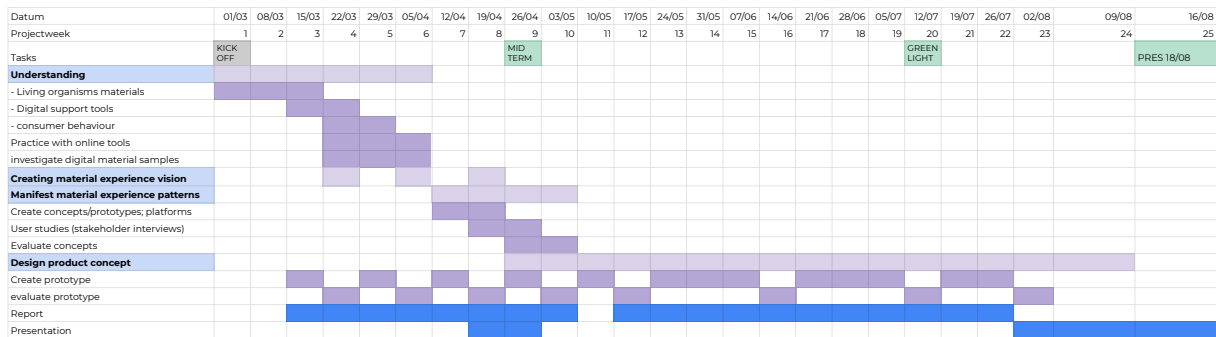
In order to address these three points, within this graduation project I am planning to adopt a RtD (Research through Design) approach. Hence, I will make use of prototypes to conduct design exploration while developing scientific knowledge (Stappers & Giaccardi, 2017) In order to test the ability of creating innovative ways to communicate livingness, the temporal/dynamic aspect and the lifespan in relation to consumer behaviour, I will specifically explore the case study of Biogarmentry focussing on two variables of consumer engagement 1) active vs passive interaction, and 2) the social dimension of sharing vs personal information. The several paper prototypes iterations will result in a final working website. To evaluate the intermediate prototypes and the final website study with users will be set up.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 10 - 3 - 2021

8 - 11 - 2021 end date



With this planning I aim to make it possible to create a web-based platform built upon understanding biodesigned textiles made from living organisms. The structure of the planning is based on some elements of the Material Driven Design method (MDD) which facilitates designing for material experiences. Nevertheless my project aims to create a digital product that aims to further develop consumer relationships with the material instead of a physical object that is often used in cases that use the MDD methodology to develop the material/product itself. Furthermore, the Research through Design approach (RtD) will be used to generate new knowledge and capture valuable insights. Hereby digital prototypes will be developed iteratively based on innovative findings from the research. The first 6 weeks will be meant to understand the design brief, to gain knowledge about bio based textiles and web-based communication techniques and to practice with certain digital tools. This research will be complemented with the aim to make 1 simple prototype each week in order to gain feedback on insights which are tested low key with only a few people. This research and the prototypes will form a base for the material experience vision which will be developed in week 6 till 7. Thereafter, week 8 to 10 will focus on ideation and conceptualization of the final web-based platform. Within these weeks the mid-term presentation will be held that presents an overview of all insights gained from research and design (prototypes) which have led to the material experience vision. The last 10 weeks will focus on building a web-based platform that is able to engage the consumer. Creating different prototypes that will test the following variables; passive <> active, sharing <> personal. Meanwhile the prototype will be evaluated on its potential to accelerate adoption of biodesigned textiles based on a specific case study of Biogarmentry. Within my planning I aim to consistently capture valuable insights by making prototypes or reporting. I aim to reach the 100 days on the 18th of August. This is caused by taking free time on national holidays plus some extra days free, because of the combination with another strategy project for the company fronteer (6/8 a week).

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

As an Integrated Product Designer my passion lies not only within power of creating new concepts but also in the implementation of new ideas. As a designer I would like to play a role in translating innovative research into real time-solutions that can be introduced to create a more sustainable society.

As a designer you will be trained to bring new innovative products on the market, this is sometimes at odds with the methodology where we want to create less waste. Because of this paradox my interest in the creation of novel materials developed. By designing materials from quickly renewable and biodegradable natural resources, the resulting product will be less of an environmental burden. There are already a lot of materials on the market that aim to be suited for commercial use. Within my graduation project I aim to gain knowledge about the diversity of biodesigned materials and their properties in order to eventually apply this knowledge in the industry that requires it. By designing materials from quickly renewable and biodegradable natural resources, the resulting product will be less of an environmental burden. I think this graduation project would be very suitable to learn a lot more about designing with biobased materials. I specifically enjoy designing with textiles. I have been sewing clothes for a long time and started a new brand where clothes are made from waste materials. I am looking forward to diving deep into a future road of textiles, enabling brands to work to a future without waste.

Next to that I aim to learn more about different design approaches in order to systematically create a design that is born to visualize textiles made from living organisms. I am open to explore and use new methods.

Next to this, I am going to design an online material experience, while doing this I hope to learn about a lot of possible ways of material storytelling in order to create a prototype that can present my research. I hope to gain skills in video, animation or 3d modelling in order to tell present innovations in such a way they can be spread and adopted in society.

In short, my learning ambitions are: - to acquire knowledge on designing with textiles made from living organisms; - practice with online storytelling techniques in order to introduce and communicate new novel materials; - to learn about and apply the Design methods in order to systematically create a functional product with a unique user experience;

REFERENCES

- Wollmann, K., van der Keylen, P., Tomandl, J., Meerpohl, J. J., Sofroniou, M., Maun, A., & Voigt-Radloff, S. (2021). The Information needs of internet users and their requirements for online health information-a scoping review of qualitative and quantitative studies. *Patient education and counseling*.
- Berg, A., Magnus, K. H., Haug, L., & Hedrich, S. (2020). Time for change: How to use the crisis to make fashion sourcing more agile and sustainable. *McKinsey & Company*, New York, NY, USA, May.
- Sheth, Jagdish. (2020). Impact of Covid-19 on Consumer Behavior: Will the Old Habits Return or Die?. *Journal of Business Research*. 117. 10.1016/j.jbusres.2020.05.059.
- Lay, R. (2019, 9 december). Digital transformation - the ultimate challenge for the fashion industry. *Deloitte Switzerland*.
- Elicia Margaret Anne Maine, 'Innovation and Adoption of New Materials' (University of Cambridge, 2000): 81; Elicia Mckinsey & company. (2020). The digital transformation of fashion now or never. *McKinsey*.
- Karana, E., Barati, B., Rognoli, V., & Zeeuw Van Der Laan, A. (2015). Material driven design (MDD): A method to design for

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

D'Olivo,P, Karana.E (n.d.). Framing Novel Materials in Design; A Case study on Biodesign Companies' Web Communication.

Karana, E., Barati, B., & Giaccardi, E. (2020). Living artefacts: Conceptualizing livingness as a material quality in everyday artefacts. *International Journal of Design*, 14(3), 37-53.