

Prof. Dr. Çağla DOĞAN, Prof. Dr. Owain PEDGLEY, Prof. Dr. Bahar ŞENER-PEDGLEY, Asst. Prof. Dr. Yekta BAKIRLIOĞLU
Part-time Instructors: Sezgin AKAN, Pelin BİLGİN, Dr. Dilruba OĞUR AYDIN, Ece YALIM
Research Assistants: Koray CANLAR, Mert KULAKSIZ, Zeynep YALMAN YILDIRIM

3 October 2022, Monday

Information Sheet: Project Brief & Biomimicry Sketch Analysis

Zero-Waste Takeaways and Deliveries: Reusable Product Family Solutions to Replace Single-Use Packaging

Single-use disposable products/items for food and drinks have become a greater environmental problem considering the influencing factors such as convenience and hygiene as part of the new normal of Covid-19. Particularly for takeaways/delivery (e.g., canteens, cafeterias, small businesses), over-packaging leads to ever-increasing waste of plastic containers, cutlery, stretch films, plastic bags, etc.

In the project context, people get either pre-packed takeaways or through preparing/ordering personalized combinations they enable and empower the practices of local/small-scale businesses. In order to rethink the food waste and associated packaging waste, design solutions can enable various users to make more informed choices about the whole cycle of food experience (e.g., preparing, storing, packaging/transporting, and serving) of takeaways. **The project aims to develop sustainable design solutions for a product family supported by accessories that enhance the whole cycle of the food experience for healthy eating.**

As part of the project, **you are expected to select one of the two zero-packaging takeaway food service business models** loosely defined below:

1. Borrow-a-container takeaway/delivery service is about local businesses lending reusable containers and accessories to customers.

This business model consists of a local/small-scale business' preparation of the products and accessories based on pre-listed items or the users' selection, borrowing the takeaways, serving, eating/drinking the food, returning and maintenance steps.

2. Bring-your-containers takeaway service is about buying food using personal containers and accessories.

This business model consists of carrying the products and accessories, having food from a local/small-scale business, serving, eating/drinking, and maintenance steps.

In this project, you need to explore the scenario steps further for the business model you focus on. As a team, you will develop a business model for takeaway/delivery services showing how the system would work in terms of actors, resources, tools and environments, and how those are related to each other for the continuity of the business model considering the needs of diverse stakeholders (mainly including business owners, users with diverse needs and producers of the product family components).

The business model will involve:

- **systems thinking map** showing the details and relationships of the business model,
- **thematic/visual identity of the local business** (e.g., app or user interface showing how the system would work) reflecting the nature of the business explaining the takeaway and delivery stages,
- **approaches to packing and delivering food & drinks involving product family members** (as explained below) by considering reusable options (e.g., fabric, paper-based materials, etc.) and diverse user needs.

You will develop a zero-waste takeaway solution for a product family. Product family refers to a set of products with variations and differentiation, such as patterns and scales adapted to different needs and/or contexts.

The main materials for containers and cups include **glass, ceramics, metals and natural fibre composites**, and their applications.

The product family also includes accessories (e.g., lids, covers, serving mats, trivets, coasters, strainers, etc.), which would support storing, carrying and serving for different needs/or contexts.

The accessories can be made of wood, glass, metal, cork, fabric, etc.

The product family should involve at least three diverse product categories. Considering the main theme and focus of the business model, each member of the team will be responsible for developing unique solutions from the following product categories.

- **Food containers** for various types (e.g., solid and liquid; hot and cold)
- **Drink containers** for various types (e.g., hot, cold)
- **Servicewares** (e.g., depending on food/drink type: cutlery, straws, trays, measuring cups, saucers, condiment holders)

There should be coherence and aesthetic unity while designing solutions for each category, as they will be presented together in line with the main theme and focus of the business model. **The target user group of this project** is people who purchase **takeaway or delivery** food from local businesses. The main preparation and serving phases include different working environments and stakeholders, shared kitchens, canteen/cafeteria staff, etc. These provide different scenarios to take into account when developing solutions.



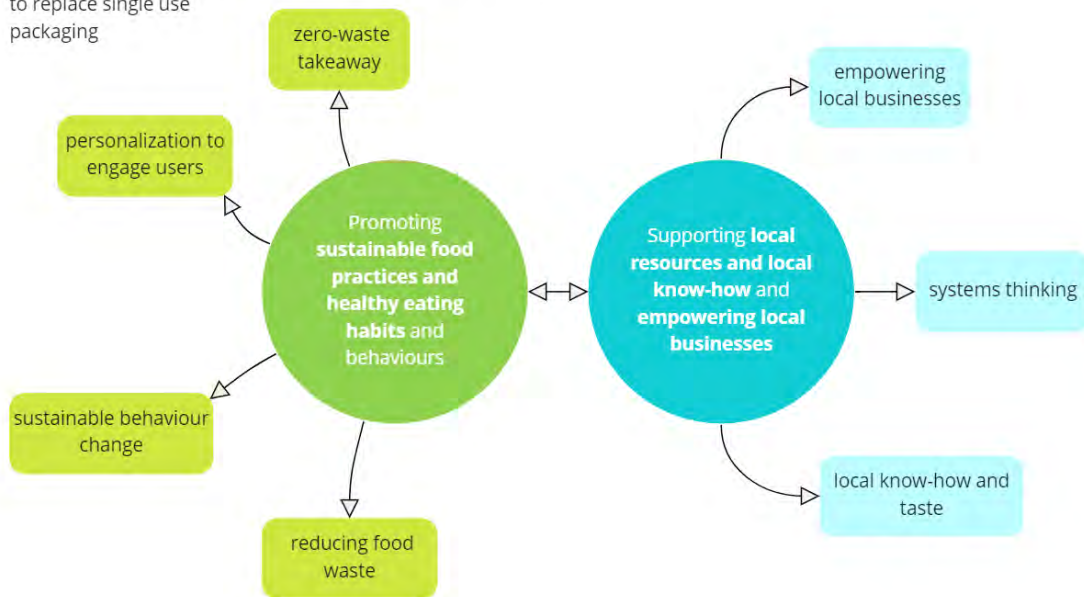
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of the European Union



Within the context of this project, we will facilitate the idea generation phase in collaboration with the **Nature Conservation Center [Doğa Koruma Merkezi - DKM]** which is currently a partner in an EU Erasmus+ Project, namely **CARE – Connect to Nature**. Our collaboration with the NCC will help us explore the Biomimicry approach more in-depth and incorporate this into the design process in line with our design considerations at the product, service and system levels.

zero-waste deliveries & takeaways

reusable product solutions
to replace single use
packaging



For this project, you will respond to the following design considerations:

1. Promoting sustainable food practices and healthy eating habits and behaviours

- Zero-waste:** Promoting zero-waste takeaway food, including drinks, meals and snacks in different contexts such as offices, schools, homes and outdoor environments by storing and serving easily, replacing single-use containers and accessories, polystyrene plates and cups, stretch film or aluminum foil for sealing, dip sauce containers, etc.
- Zero-food waste:** Reducing food waste by emphasizing the homemade quality of food, its freshness, hotness or coldness, keeping food fresh, safe and secured, proper/personalized portioning.
- Personalization:** Making containers and accessories more engaging and attractive via personalization (dietary needs, portioning needs, aesthetic needs, shared environment needs).
- Behaviour change:** Adopting healthy eating habits, taking action for zero-waste and taking responsibility for cleaning and maintaining containers and accessories by creating new aesthetics and food experiences.

2. Supporting local resources and local know-how

- Local business:** Defining the business model and its challenges, pricing the food being sold (i.e., weigh, measure or count the food being sold).
- Systems thinking:** Considering the whole service system and actors in the business model, the lifespan of the design solutions in the system including storage, use, and return/take back mechanisms (e.g., containers should be cleaned and sanitized properly for reuse).
- Local know-how and taste:** Understanding and supporting local food cultures such as local ingredients (locally sourced fruits, veggies and spices), local needs, preferences and tastes; providing opportunities for labeling and sharing information and recipes in the preparation and serving phases.



Current Stage of the project

Until the CARE – Connect to Nature project visit to the studio for the Biomimicry Sketch Analysis Workshops, the ID301 students have finalised:

- Food Experience Workshop to identify opportunities and challenges of storing, transportation and cleaning for different types of food and drinks,
- User Research to understand users' needs, preferences and wants from takeaway/delivery services and their attitudes towards packaging,
- Literature Search to identify existing takeaway/delivery services, opportunities and challenges of different materials, visual and digital identities of such services, and healthy eating habits and trends,
- Networked Business Model Canvas workshops to explore alternative delivery/takeaway businesses that use zero packaging and create economic, environmental, social and cultural values.

During the CARE – Connect to Nature project visit, the students and visitors will carry out Biomimicry Sketch Analysis (Assignment 2 of Zero-waste Takeaways/Deliveries project) together. The assignment description can be found below.

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24 October 2022, Monday

ASSIGNMENT #02

Biomimicry Sketch Analysis (BSA) Part 1 & 2

'Zero-waste takeaways: Reusable product solutions to replace single-use packaging'

Digital submission: (only PDF, real size 200 dpi, three A4 Portrait, two A3 Landscape, based on the formats provided). **Please compile Part 1 one PDF file and Part 2 in another one PDF file:** <http://odtuclass.metu.edu.tr> ([ID302 All Sections], Industrial Design III),

Part 1: 24 October 2022, Monday 13:40

Part 2: From 24 October 2022, Monday 17:00 to 27 October 2022, Thursday, 17:00

BSA Part 1 & 2

Biomimicry involves evolving strategies inspired and informed by nature. In this assignment, you are expected to explore the following strategies: (resource: asknature.org; https://asknature.org/?s=&page=0&hFR%5Bpost_type_label%5D%5B0%5D=Biological%20Strategies&is_v=1)

1. **Make / Physically Assemble Structure:** Living systems use physical materials to create structures to serve as protection, insulation, and other purposes. These structures can be internal (within or attached to the system itself), such as cell membranes, shells, and fur.
2. **Modify / Modify physical state:** Living systems change their physical state in a wide variety of ways for a wide variety of reasons, such as to move or fit into small spaces. They may change volume, color, speed, density, or any other number of states.
 - **Modify Size / Shape / Mass / Volume:** Many living systems alter their physical properties, such as size, shape, mass, or volume. These modifications occur in response to the living system's needs and/or changing environmental conditions.
 - **Modify Position:** Many resources that living systems require for survival and reproduction constantly change in quantity, quality, and location.
3. **Modify / Adapt or Optimize:** Living systems are adapted to survive within certain ranges of environmental conditions. Some thrive only at a specific elevation or within a narrow temperature range, while others have wider ranges of tolerance.
 - **Optimize Shape/Materials:** Living systems optimize, rather than maximize, resource use. Optimizing shape ultimately optimizes materials and energy.

4. **Move or stay put / Attach:** Living systems must sometimes stay in one place, climb or otherwise move around, or hold things together. Each of these requires some kind of attachment, whether permanent or temporary and releasable.
 - **Attach-temporarily:** Living systems must sometimes, temporarily, stay in one place, climb or otherwise move around, or hold things together. This entails attaching temporarily with the ability to release.
5. **Protect From Physical Harm:** From large, complex ecosystems to tiny organelles within cells, all living systems face threats to their physical well being. These threats come from both living and nonliving sources. Threats can exert structural forces on the living system and cause structural failure.
 - **Manage Structural Forces:** Everyday, living systems are subjected to structural forces. These forces include impact, tension, compression, chemical and mechanical wear, and more.
 - **Prevent Structural Failure:** Everyday, living systems are subjected to structural forces. These forces include impact, tension, compression, chemical and mechanical wear, and more. Living systems are subject to many forces and have strategies to minimize the impact of those forces.
 - **Self-defined:** (You may choose or identify your own strategy related to the project theme)

BSA Part 1 • 24 October

For the first part of BSA, to explore the strategies given above, select **three** sources of inspiration from diverse strategies as outlined above; **at least one from observations in nature** and **two from Internet databases or websites such as asknature.org**. You may be inspired and informed by any of the sources shared in the source file but you need to make further research on it prior to your submission. Please use the format provided on ODTÜClass (ID301_2021_BSA_format_part I_2021.docx) that includes the image(s) of the source of inspiration, the related strategy (see above) and a brief description explaining why you selected that source. You will submit one template-page for each inspiration, **in total three A4**.

BSA Part 2 • 27 October

For each source of inspiration, prepare a detailed hand sketch analysis (e.g. Figure 1 and 2) which describes and visualizes the following aspects and **reflect on that practice**:

- **The source of inspiration**
- **Its unique feature(s) and component(s)** in terms of the biomimicry strategies (e.g. make, modify/adapt, move/attach, protect, etc.) presented in BSA Part I
- **The implications of the feature(s)** for this particular design project in terms of connection details, form, color, surface, pattern, feedback, scale, etc.

Make sure that each biomimicry sketch analysis would focus on diverse strategies.

Submit in a total of two A3 (landscape) biomimicry sketch analyses considering the format provided on ODTÜClass (ID301_2021_BSA_format_part II_2021.pdf - you can open this pdf in Photoshop or Illustrator for editing).

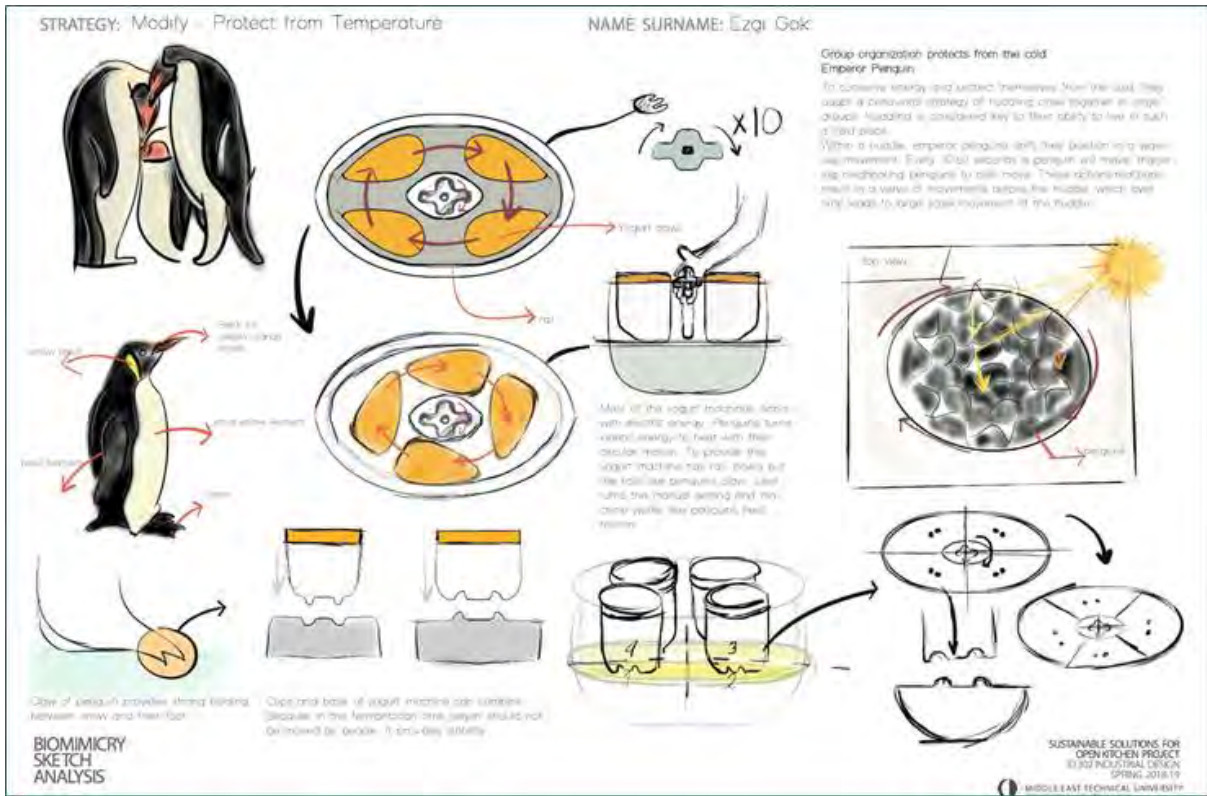


Figure 1: An example of Biomimicry Sketch Analysis presented by Ezgi Gök, METU ID, 2019.

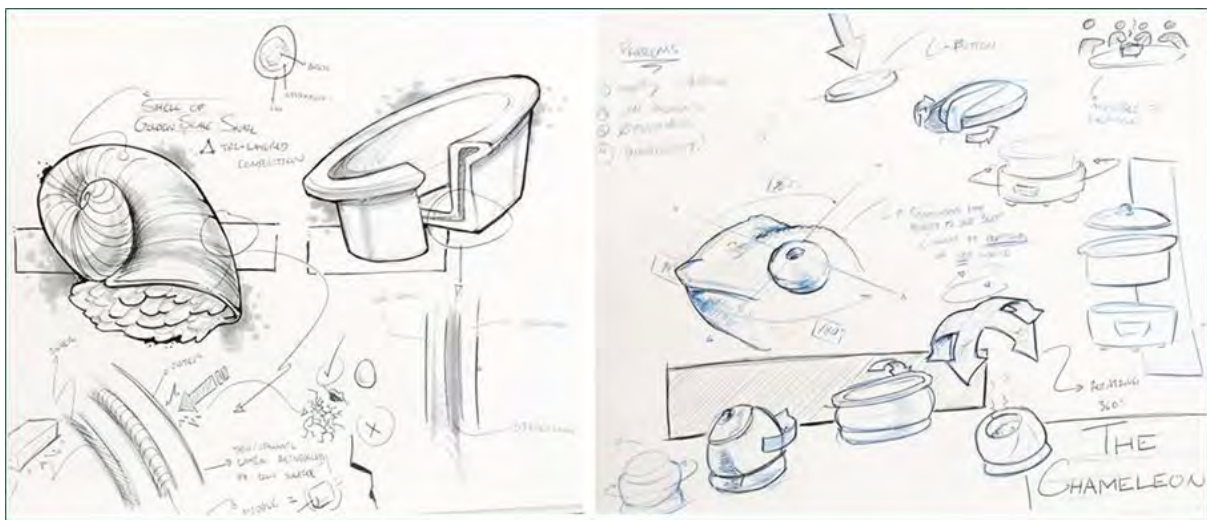


Figure 2: An example of Biomimicry Sketch Analysis presented by Andres Vasquez Valiente, Carleton U., SID, 2017.