



Relating Systems Thinking and Design
2022 Symposium
University of Brighton, Brighton, UK,
October 13-16, 2022

Using Systemic Design to Drive the Transition of the Professional Kitchen towards the Circular Economy Scenario

Chiara Battistoni

Università IUAV di Venezia

This research project considers the professional kitchen as a system where the food and the work of cooks draw connections among different tools and kitchen equipment to produce a meal. The project, which is in process, applies systemic design to design the future of professional kitchen equipment into a circular economy scenario – not taken in isolation but as part of the system of the professional kitchen. This design challenge is being approached as a systemic design project because requirements beyond the kitchen will be considered – product, environmental, economic, cultural, and social. Moreover, the research is being conducted simultaneously; therefore, systemic design methodologies, methods, and tools make it possible to identify design solutions beyond the current ones, which have been conceived in a linear economy. While trying to solve this design dilemma, tools for designers will also be developed.

The research started with a holistic diagnosis of the context to establish a complete picture of the state-of-the-art around the topics. Development involves delving into the kitchen environment, where there is significant use of resources (food, energy, water, people, products) to understand how they are used and assess the flow of information and resources. Results will be illustrated in a gigamap (holistic diagnosis). A kitchen will be analysed in detail to afterwards make general conclusions from this specific data collection. Thanks to the involvement of a large industry producer of professional kitchen equipment in

this research, it will be possible to conduct field research in their canteen to incorporate specific data. In addition, the primary draft will be tested through interviews with chefs to collect also feedback about the problems related to the management of resources.

At the end of the data collection process and the development of the tools, future work will be testing their efficacy in workshops with design students approaching the design for a professional circular kitchen and discussing the results. The research also extends to understanding the usefulness of this approach to design solutions for a circular economy scenario.

KEYWORDS: systemic design, kitchen equipment, circular economy, food service system, food waste

RSD TOPIC(S): Socioecological Design, Sociotechnical Systems, Cases & Practice

Presentation summary

As the RSD11 focus area suggests, “products are systemic objects,” the professional kitchen can be considered a system where the food and kitchen workers draw connections among different tools and equipment to produce a meal as a food service. This research applies a systemic design framework to design the future of professional kitchen equipment into a circular economy scenario, not taken in isolation but as part of the system of a professional kitchen. Moreover, this design challenge can also be considered a systemic one because it considers different requirements simultaneously – products, environmental, economic, cultural and social.

Changing cultural points of view and integrating systems thinking are fundamental to transition from the current linear economy to a circular economy (Ellen Macarthur Foundation, n.d.). In a circular economy, products at the end of their life cycle are not viewed as waste for the landfill but valuable resources to be reintegrated into the product life cycle, creating closed (or open) loops. This way, there is no need to create more landfills but systems to re-insert the resources in the cycles. In this scenario,

products are no longer viewed as single objects but are part of the systems where they are nested. A systemic design approach, together with related tools and methods, can be helpful to use to design different solutions in this scenario (Barbero, 2017).

Related to the goal of trying to solve the dilemma of designing kitchen equipment and appliances for the circular economy, this project is creating tools to help the work of designers in the process: from a theoretical framework to a flow gigamap. In particular, the research in progress started from a holistic diagnosis (Battistoni et al., 2019) of the context to have a complete picture of the topics included in this research.

Method

The project started with desk research, including a literature review of scientific papers and reports, led by a research framework inclusive of the contributions. These started with the main steps of the product life cycle: design, manufacturing, sales, distribution, use, and post-use (paper by the author pending publication). This framework (the core in Figure 1) started with the domestic context and afterwards extended to the professional one. It can be defined as a gigamap (Sevaldson, 2018) which helps to manage the complexity of the topic that is increasing during the research path.

In development is an assessment of the flows of information and resources in the kitchen environment, where there is significant use of resources (such as food, energy, water, people, products,..).

The first graphic draft of the flow map (holistic diagnosis phase 1: energy and matter analysis) will be developed starting from the core of the process represented in Figure 2. Gigamaps are created on open software that supports sharing the work with others and collecting feedback.

Information and data from field research in a specific professional kitchen are being collected and analysed. A second layer will be added to this phase to collect information regarding the problems faced with the management of the resources and processes and share it with people working in this professional environment for feedback from their experience. The analysis starts from a specific professional kitchen to collect detailed data to afterwards extend the conclusion to a general professional kitchen.

The involvement of a large industry producer of professional kitchen equipment in this research will ease the field research in their canteen kitchen and, moreover, the challenge of directly connecting chefs and others working with the industry to test the primary draft through interviews and collect feedback about the problems related to the management of resources.

Conclusion

The study will give insights into understanding what are (in quantity and quality) the resources used in a professional kitchen and their management. Indeed, in kitchens, energy consumption is the one that the appliances and kitchen equipment industries are more focused on, thanks to the introduction of energy labels (EU, n.d.). Although there is a lot of water consumption involved, there needs to be serious attention to the quantity and quality of it because the input is drinkable water for all uses, and the wastewater is a value wasted (e.g. the heat from hot water). Water will become a scarce and expensive resource, sure to gain more attention in future research - *"Water is considered the gold of the 21st Century"* (ICWRGC, n.d.) There are also several contemporary studies on food waste and the circularity of the food system (Fassio & Tecco, 2018), albeit the project is grounded in the view that the function of the kitchen, its use and quality are also dependent on the clients/users choices in menu and cooking processes.

At the end of the data collection process and the development of the tools, future work will be to test their efficacy. Workshops will be conducted with design students approaching the design for a professional circular kitchen to discuss the results, in terms of education method but also at the design level. Also, designers and product managers working in the industry will be involved in workshops to let them reflect on these topics that nowadays they are not considering. The research also extends to understanding the usefulness of this approach to design solutions for a circular economy scenario.

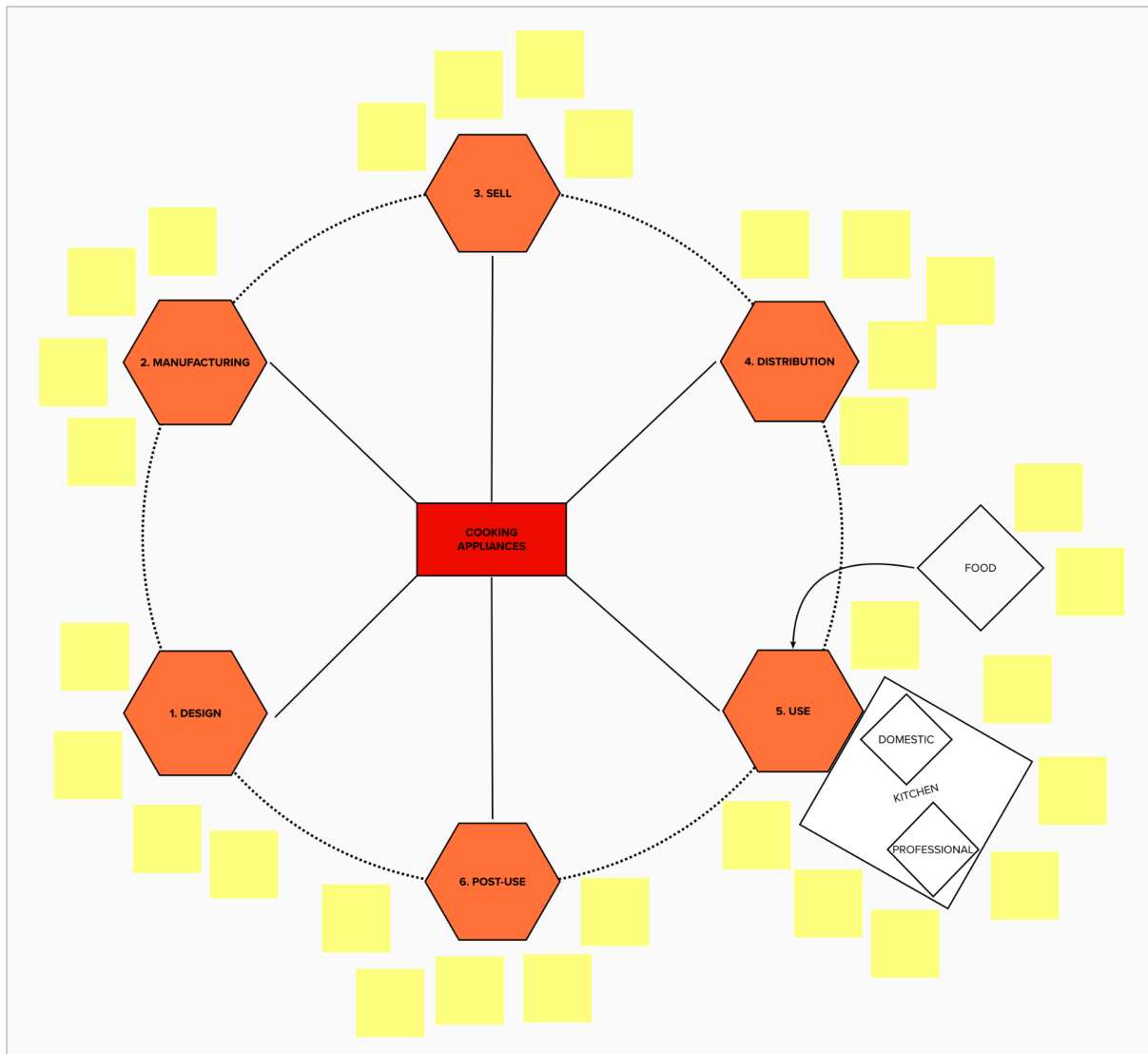


Figure 1. The core of the framework. Published in a paper by the author pending publication.

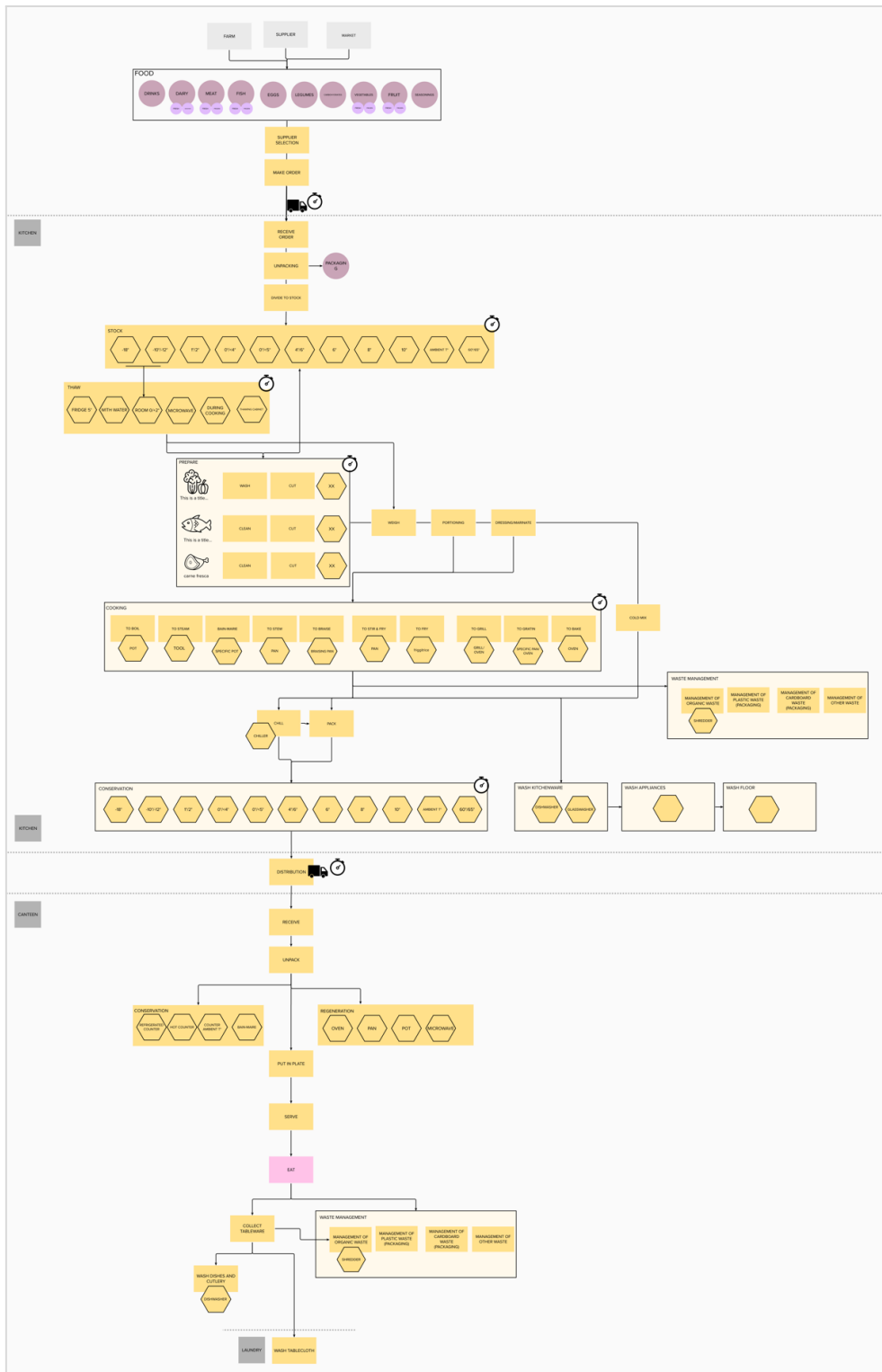


Figure 2. The core of the process for the flow map. Example taking into consideration a general canteen.

References

1. Barbero, S. (2017). Systemic Design as Effective Methodology for the Transition to Circular Economy. In: Barbero, S. (edited by), *Systemic Design Method Guide for policy maker: a circular Europe on the way*. Torino: Allemandi. Retrieved from <http://ilgiornaledellarte.com/articoli/2017/10/128271.html>
2. Battistoni, C. (in publication). A framework to design appliances for the circular economy scenario. *Proceedings of the conference 8th International Forum Design as a Process*.
3. Battistoni, C., Giraldo Nohra, C., & Barbero, S. (2019). A Systemic Design Method to Approach Future Complex Scenarios and Research Towards Sustainability: A Holistic Diagnosis Tool. *Sustainability*, 11(16), 4458. <https://doi.org/10.3390/su11164458>
4. Ellen Macarthur Foundation (n.d.). *Systems and the circular economy*. Retrieved from <https://archive.ellenmacarthurfoundation.org/explore/systems-and-the-circular-economy>
5. European Commission (2020). *A new Circular Economy Action Plan for a cleaner and more competitive Europe*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>
6. European Commission (n.d.). *Etichettatura energetica e progettazione ecocompatibile*. Retrieved February 9, 2022, from https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/about_it
7. Fassio, F., & Tecco, N. (2018). *Circular economy for food. Materia, energia e conoscenza, in circolo*. Milano: Edizioni Ambiente.
8. ICWRGC (n.d.). *Water – the Blue Gold*. Retrieved February 9, 2022, from <https://www.waterandchange.org/en/water-the-blue-gold/>
9. Sevaldson, B. (2018). Visualizing Complex Design: The Evolution of Gigamaps. In Jones, P.H. *Systemic Design* (pp. 243–269). Springer.