UNIFORM DESIGN INNOVATION

BRIDGING ACADEMIA AND INDUSTRY THROUGH MULTIDISCIPLINARY COLLABORATION

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Abstract

The article presents a proposal for a multidisciplinary and multistakeholder learning and collaborative model that connects the worlds of business and academia through the presentation of an experimentation. The model is presented through an experimentation of uniform design, led by University of Bologna, commissioned by the railway company Trenitalia Tper, and in collaboration with the Polytechnic University of Milan. The project aimed to dress the staff of the company by involving students and faculty from the two schools of fashion, product, and service courses with local businesses. The experimentation presented here aims to highlight the ways in which a learning model involving professionals from the world of research and industrial production can enable the elaboration of outputs in line with the current challenges of the contemporary fashion system. The experimentation, along with the proposed method and model, aims at testing and verifying the relevance of the so-called collective intelligence in design-driven innovation processes, particularly those of 'open innovation'. The proposed experiment confirms the relationship between collective intelligence, as a result of the combined knowledge and expertise of a diverse group, and innovation readiness in enterprises. In this light, a model is presented that, through co-design processes, can propose new strategies for an industry transformation, in a challenging application theme such as technical clothing and uniforms, where what is worn is loaded with values and symbols in society.

INTRODUCTION

The article presents a proposal for a multidisciplinary and multistakeholder learning and collaborative model that connects the worlds of business and academia through the presentation of an experimentation. 'Pluriform: Pluriverse Uniform Design' is a project led by the Advanced Design unit, a research group heading the courses in Design at the University of Bologna, commissioned by Trenitalia Tper, the regional rail transport company in Emilia-Romagna, and in collaboration with the Polytechnic University of Milan, School of Design. The project aimed to dress the staff of the commissioning company by involving students and faculty from the two schools of fashion, product and service courses with local companies. The experimentation presented here aims to highlight

the ways in which a learning model involving professionals from the world of research and industrial production can enable the elaboration of outputs in line with the current challenges of the contemporary fashion system. The experimentation, along with the proposed method and model, aims at testing and verifying the relevance of the so-called collective intelligence in design-driven innovation processes, particularly those of "open innovation". The latter is defined as "as a distributed innovation process based on purposively managed knowledge flows across organisational boundaries" (Chesbrough & Bogers, 2014). The topic of collective intelligence has become increasingly popular in literature since the advent of the Internet and has been addressed in various scientific fields. Analysis of the most significant contributions

shows how the application of the concept is independent of the size of the reference group, ranging from detecting cooperation dynamics in small offline groups to those in large groups in distributed online contexts (Salminen, 2012). The proposed experiment confirms the relationship between collective intelligence, as a result of the combined knowledge and expertise of a diverse group, and innovation readiness in enterprises (Lee, 2019). In this light, a model is presented that, through co-design processes, is able to propose new strategies for an industry transformation, in a challenging application theme such as technical clothing and uniforms, where what is worn is loaded with values and symbols in society.

METHODOLOGY

This article presents the case study of a multidisciplinary and multistakeholder model that has been designed and applied into a hybrid research-education-business context. The article structure follows the steps that from the meta-design and preparatory analysis led to the implementation of the model. The model design started with the analysis of the practices that the Advanced Design Unit has adopted in similar hybrid contexts. A brief overview is presented in the state-of-the-art paragraph. The specificity of 'Pluriform' is addressed to define a flexible model capable to mediate the expected outcomes, needs, and schedules of the different stakeholders. The phases of the collaborative model structure are introduced describing the three macro-phases, the involved actors, the means and methods of collaboration, and the expected outcomes. For the scope of this article, an in-depth analysis of the first meta-design phase is presented highlighting the sub-activities and the range of modalities that have been adopted. The implemented participatory, co-design, and training models are presented from the perspectives of the involved actors. In the discussion paragraph, the identified strength, and limits of the meta-design phase of the model are investigated, also in relation to the subsequent development and implementation phases that will be presented in future works. The last paragraph presents the conclusion and the possible future development of the experimented model.

MULTIDISCIPLINARY AND MULTI-STAKEHOLDER LEARNING AND COLLABORATIVE MODELS: PROCESSES AND PRACTICES

In the contemporary landscape, organisational boundaries have evolved into permeable constructs, facilitating the shift of innovation from internal realms to dynamic relational systems inclusive of external partners (Bogers & West, 2012; Chesbrough, 2006). Open Innovation processes serves as a conduit, enabling organisations to assimilate and exploit resources and capabilities beyond their internal perimeter, thereby augmenting value and optimising the outcomes of innovative endeavours. This process fosters the convergence of knowledge flows between external and internal domains, involving a diverse array of stakeholders such as suppliers, collaborative firms, competitors, technology hubs, customers, governmental bodies, and universities. Particularly, the cooperation between university and enterprise is crucial for innovation (de las Heras-Rosas & Herrera, 2021) and models of collaboration range from formal knowledge development alliances (Hagedoorn, Link & Vonorotas, 2000) to informal networks (Oliver, 1998). Universities play a pivotal role as trusted intermediary within academic commitment (Perkman, 2008), referring to collaborations involving academic researchers and non-academic organisations which encompass both formal activities such as collaborative research, contract research, and consultancy, as well as informal activities like personalised advice, networking with other professionals and knowledge production, regeneration, and distribution among actors. Knowledge production can be considered as a cause and an effect of collective intelligence. Lévy (1997) coined the modern version of collective intelligence, which he defines as a "new universally distributed intelligence that constantly improves and coordinates in real-time". For the first time in history, argues the author, the Internet has made it possible for members of a decentralised system to interact with each other within the same virtual knowledge universe. This has enabled a new knowledge-producing culture based on rapid and open exchange of data and ideas. Lévy foresaw that this would lead to a fundamental change in how we think of ourselves. Knowledge is no longer about established facts, but rather the essential part of an ongoing knowledge construction project that includes all human beings.

In project-based learning, which inherently characterises the approach embedded in design education, various forms of collective intelligence behaviour can be amalgamated (Hogan et al., 2023), encompassing *swarm behaviour* (direct forms of coordinated aggregate behaviour), *stigmergy* (indirect coordination through the environment among agents or actions), and *collaborative behaviour*. It is observed that collaborative behaviour facilitates the expansion of group coordination dynamics by leveraging diverse skills and technologies in tandem. If, on one hand, collective intelligence thrives and simultaneously leverages collaborative dynamics, on the other the experimentation examined in this paper, along with others conducted in various organisational contexts involving collaborations between universities and industry, has highlighted how it is able to foster agency. Emirbayer and Mische (1998) define agency as a process of temporally embedded social engagement, informed by the past, oriented towards the future, and contextualised within the contingencies of the present. Barandiaran (2009) identifies three conditions that a system must meet to be considered a true agent: defining its own individuality, being the active source of action in its environment, and regulating its activity in relation to specific norms. Agency of individuals engaged in the co-production processes of innovation, both students and enterprise members had a positive effect on motivation, engagement, and outputs of the overall design-driven innovation process.

The Advanced Design Unit research group has a history of integrating knowledge across disciplines in multi-actor contexts to train young designers. Through initiatives like the 'Frontier' international workshop, they foster dialogue among students, teachers, researchers, and businesses from Italy, Brazil, and Colombia, focusing on digital technologies to innovate traditions like textile-related crafts. This interdisciplinary approach cultivates collaborative and transversal knowledge transmission, enhancing skills in diverse cultural processes (Celaschi, 2008; Mattioli et al., 2020). Hybridising disciplines adds complexity to projects, incorporating methodologies and tools while embracing cultural diversity (Migliore et al., 2020; Augsburg, 2014; Celaschi et al., 2013).

'Data Challenge' project explores the transformation of Bologna's libraries into vibrant cultural hubs, aligning with trends towards increased cultural access and community engagement (Golten, 2019). Collaborating with the Bologna Municipal Library Sector, the Advanced Design Unit conducts experiments using a systemic and multimodal approach to data collection, involving big data, qualitative student-generated data, and project data. This collaboration engages Design students in space redesign, enriching their educational journey and fostering discussions on education renewal through design (Colitti, Formia, Gianfrate, & Succini, 2023). Embracing Responsible Innovation principles, the project activates inclusive cross-sectoral connections, expanding traditional education horizons and fostering collaboration between universities, cities, territories, and public administrations, leading to innovative approaches to education and culture (Bailey et al., 2016).

AN EXPERIMENTATION IN UNIFORM DESIGN

'Pluriform' is intended to design uniforms for three categories of regional rail transportation staff: the driving staff (those who are responsible for driving the train), on-board staff (trainmaster, on-board assistance, and anti-evasion), and commercial staff (sales and station ground staff). The employees of a transportation company are the frontline of a complex system of technologies, investments, and organisation that give evidence of the company's efficiency and quality of performance to the travellers who entrust their safety and comfort to it. Trenitalia Tper's on-board, conducting, and commercial staff numbers 1441 people of at least three different demographic generations, education levels, geographic origins, personal aspirations and expectations. These are in direct contact with customers every day in every weather season of the year, in any eventuality of operation of the machines, often in contact with critical relational and human situations, playing a role as a public official to transfer order, regularity of service, assistance, continuous indication and observation, reporting to the Company and presiding over every occurrence. Against this problematic backdrop is the 'Pluriform' project, an activity that involved 9 faculty and 19 students, both bachelor's and master's degrees, from the two universities involved, and 3 companies.

The activities were divided into three macro-phases (fig. 01):

1. *Metaproject*: A core group of researchers from the University of Bologna activated a Trenitalia Tper focus group (a group
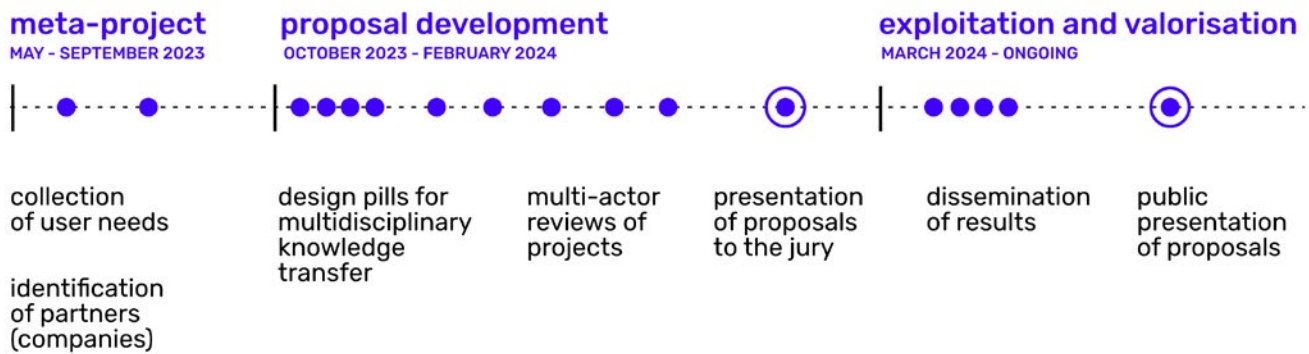
meta-project
MAY – SEPTEMBER 2023

proposal development
OCTOBER 2023 – FEBRUARY 2024

exploitation and valorisation
MARCH 2024 – ONGOING

collection of user needs

identification of partners (companies)

design pills for multidisciplinary knowledge transfer

multi–actor reviews of projects

presentation of proposals to the jury

dissemination of results

public presentation of proposals

Fig. 1

of employees mixed by age, gender and professional profile, consisting of 8 individuals selected by the company) in order to generate in an organised and collective way the project theme by defining the characteristics and performance, discussing equivalent case studies, responding to collaborative design processes. The purpose of this phase was to arrive at the drafting of a briefing document capable of summarising the need in a technical and cultural way. Outcome of the project was the 'Metaproject document' that served to build a shared and clear design brief to be entrusted to the designers of phase 2 and build in the company a climate of adherence to change and cohesion to the values of uniformity.

2. *Proposal Development*: Four project groups made up of recent graduates and students from the Bachelor's Degree Course in Industrial Product Design, the Master's Degree Course in Advanced Design of Products and Services at the University of Bologna, and the Bachelor's Degree Course in Fashion Design at the Polytechnic University of Milan were administered and organised by the research and teaching staff of the two universities in order to interpret the brief developed in the first phase on the basis of the elements that stimulate innovation and tradition from the outside. Each group had four months to prepare a project line and formalise the design of a collection and a digital

prototype understandable by Trenitalia Tper employees and referents. This phase took place in constant comparison with the focus group involved in phase 1, which, at three separate times, was called upon to evaluate the students' progress. In addition, 2 companies from the district of Carpi, one of the main districts in the Fashion Valley of Emilia-Romagna that stands out for the production of Knitwear and Clothing, consisting of more than 1,000 companies with about 7,000 employees (www.carpifashionsystem.it), which supported the students from a technical and industrial point of view. Finally, a company provided and supported the use of 3D representation modelling software with which students could visualise and present garments from their collection.

3. *Exploitation and valorisation*: The outcome of the groups' work was assessed by a panel of judges made up of the focus group members, and additional staff members called upon to participate in this last phase, and the collection that will become the future uniform of Trenitalia Tper staff was identified. This internal event will be followed by a public event at which the selected uniform will be presented, also by means of physical prototypes, and the best design based on the brief adopted will be recognised and publicised.

METAPROJECT

The project began with defining the brief collaboratively with company members. Three phases

ensued: systemic mapping, employing systemic questioning techniques (Radatz, 2006) to elicit internal perspectives and challenge beliefs. The "4A" approach - Analysis, Ambitions, Actions, (Self) Assessment - guided experimentation, revealing employee nuances like innovation, collaboration, and autonomy. Qualitative findings formed a systemic map, guiding participant selection for the co-design phase while maintaining diversity. Ten out of fifteen participants were chosen, with the remaining five invited as validators in the final phase. This process fostered innovation, addressing operational insights and improvement challenges, while reflecting on collaboration styles in decision-making. Following the first macro-step's results, approximately fifteen days later, the second phase involved a co-design day with the selected employees. The aim was to define an initial high-level brief while simultaneously engaging the group's meta-dimension to prepare members for active participation and contribution throughout the process. Given the diversity among attendees in terms of company vision, roles, expectations, and desires for uniformity, creating and facilitating a participatory yet protected space for group expression proved crucial for the project's overall success. The 8-hour co-design session was divided into four phases: 1. *icebreaking*, 2. *setting*, 3. *inspiring*, and 4. *building*.

After an ice breaking phase focused on emphasising acceptance of others' viewpoints and fostering an empathetic relationship rather than focusing on output perfection, the focus group had a second session based on LEGO Serious Play. Here, participants alternated between individual and collective moments to explore the uniform's identity, delineate its main identity traits, and construct a shared aspirational and inspirational map. According to Heikkinen and Nemilentsev (2014), this methodology encompasses the four fundamental principles: ensuring everyone can express their viewpoint; allowing inquiries about the specifics of others' creations without challenging them; recognizing that there is no singular correct solution to the given challenge; and deriving all answers from the constructed artefacts. Through individually constructed models made by bricks, multiple distinct viewpoints and interpretations of solutions regarding the same challenge can be easily obtained. To initiate collective construction efforts, each participant first creates their own model. Subsequently, these individual contributions

are amalgamated through negotiations among group members to form a comprehensive collective construction. This approach facilitates the reconciliation of differing perspectives and requirements in addressing the challenge.

The third part of the day was dedicated to sharing a variety of innovative uniform case studies from the transportation industry and beyond, followed by the fourth and final building phase. This segment featured a collage technique where participants were divided into two subgroups, with one focusing on developing an aspirational idea for the future train conductor's uniform and the other on the engineer's uniform. Each group was provided with superhero cards and tasked with creating an hero consisting of three components: head (identity), heart (emotions), and legs (functionality), composing three parts from different superheroes. The co-design day concluded with a pitch presentation of the two heroes to the company's CEO and management team, signalling strong commitment from the company's leadership to the project.

The outputs of this phase integrated into the *Metaproject d*ocument were 1) the *Project Purpose & Brief*, a document that reported the results of the focus group, 2) the *Photocatalog* of current Trenitalia Tper uniforms, a document with a description of the individual garments currently used, their combinations, the regulations and the feedback obtained on the individual garments during the focus group, 3) a portfolio of stimuli for the project with an initial search for case studies and design trends identified from the results that emerged in the focus group that went into supplementing the research and competence domains for students.

PROPOSAL DEVELOPMENT

After the activation and call to action directed at the DZC, the Design Community of the University of Bologna that brings together students, alumni, and young designers interested in the field of design and fashion, the co-design process was initiated with common grounding sessions. These sessions aimed to establish a common ground of knowledge, objectives, and languages, thus facilitating the collaborative process. They were used to ensure that all participants shared the same vision of the project and understood the needs and expectations of Trenitalia Tper related to the new uniform design. The collaboration methods were mixed, utilising remote work

platforms such as Microsoft Teams to allow students who could not be physically present to contribute significantly. In-person meetings and workshops were organised to promote greater interaction and idea exchange among participants. The participants were divided into small mixed groups, composed of students from different disciplines and levels of study, to promote diversity of thought and an interdisciplinary approach. Each group was tasked with developing design proposals based on feedback from the focus group, taking into account the functional, aesthetic, and ethical constraints identified in the project.

The co-design process unfolded in several phases, each with specific goals and deliverables. The students were accompanied by expert tutors who guided them through the creative process, from idea generation to prototyping, up to the presentation of the final proposals to the clients. The journey was enriched by moments of evaluation and feedback, where industry professionals and representatives of Trenitalia Tper provided the student groups with feedback on ongoing proposals, thus ensuring that the final result best met the company's needs and the input from the workers.

Phase 2 consisted of two main stages: 1) the transfer of knowledge and skills to students on key and current issues related to fashion and textiles, managed by the team of researchers and lecturers of the two university, also involving selected companies, and 2) sharing and reviewing on the project's progress with all stakeholders (professors, researchers, client, and textile and apparel businesses). In defining the interventions for the skills transfer phase, the coordinating team gave attention to the key issues in the field: attention to biological and gender distinction, the size and anatomical shapes of types, the ability to create products that can respond to the different climatic conditions to which the workforce is subjected-whose criticality is now increased by climate change-the need to create products that are attentive to environmental sustainability and circularity, and attention to employee safety and well-being. These themes were declined and deepened in six short lectures called Design Pills on the following topics: service design for fashion, circular practices for textile product, fashion design, applied anthropometry and visual perception, the role of designer-mediated technology for the well-being of users, and tools and technologies for virtual garment represen-

tation. In addition, students were lectured on materials and technologies for technical apparel design by companies in the Carpi district, which they were also able to visit for field research.

The Design Pills on Circular Practices for Textiles aimed to provide students with useful tools to think about the sustainability and circularity of garments and products from the uses of materials. The textile sector is now the second largest sector in terms of pollution due to its method of production, consumption, and purchase (Ellen MacArthur Foundation, 2021). Students received guidance on how the introduction of processes proper to the circular economy can enable them to reflect on a systemic vision of design to respond effectively to the complexity that describes the contemporary industrial context (Bompan, 2021) and, in particular, that of fashion. Reasoning about the different levels on which the designer can act for a circular and sustainable transition (Author, 2023), students were provided with examples of circular materials to be used (Pellizzari & Genovesi, 2021), material libraries from which to select them, paying attention to origin, disposal but also to the processes applied; in addition, strategies to lengthen the life of fashion and textile products such as disassembly of parts, customization, and repair were addressed (Circular Fashion, 2019).

The Design Pills on Service Design practices for Fashion aimed to promote systematic innovation that considers not only the product but also the related service ecosystem. This approach can be defined as the process of designing, planning, and organising the relationships among people, infrastructure, communications, and material components of a service, to enhance its quality and the interaction between service providers and customers (Stickdorn et al., 2018). Addressing projects through the lens of Service Design entails recognizing and managing unpredictability (Kimbell, 2011), considering the influence of constraints, entrenched cultures, and the goals of various stakeholders. This process leads to the discovery of new insights, revealing how even well-designed systems may overlook the less obvious aspects of users' everyday lives. Co-creation, a fundamental part of Service Design, calls for a serious engagement with end-users (Mager, 2006); this process can unleash energy and motivation for change. A change that often pertains not to machines or production processes, but rather to structures, cultures, and behaviours of people. There were two 'Design Pills' that focused on the

human body and its relationship to well-being. The first pills circumscribed, from an ergonomics perspective, some elements of primary importance with respect to the project at hand. After an initial orientation on the fundamentals of anthropometry within a work context, designers were guided to the critical observation of uniforms using historical models from the field of transportation. In a second step, the concept of well-being was explored as a balanced condition of the human when in relation to specific machines and environments. The condition of well-being was then investigated with respect to the multiple users, direct and indirect, who come into play (Sicklinger, 2020). The uniform then becomes an instrument of the wearer but also of those who relate to the wearer. Further insight into well-being has been the relationship between the human body and digital technologies resulting from the intensive use of computing devices. This is a situation, for example, very present in train staff where tablets, pos, cameras and other devices demand continuous actions and attention. These dynamics result in often uncomfortable movements and postures that, if repeated over time, lead to excessive fatigue or even pain. In relation to technologies, the issue of well-being has been studied as a measurable condition that can be verified with quantitative data to identify critical issues on which to intervene. The designers therefore considered the appropriateness of detecting data pertaining to different areas by placing sensors on the body of personnel.

The 'Design Pill' dedicated to the 3d garment design and visualisation had the goal to give the participants basic knowledge on modelling and visualisation technologies. This section had the scope to evaluate the opportunities offered by the adoption of digital tools both for productive and communicative purposes. Participants engaged both in guided and autonomous software training. Each group identified an iconic outfit representative of the whole collection. The modelled 3D garment was collected and presented on a digital runway. The 4 working groups, each consisting of 2 fashion design students, 1 product design student and 1 service design student, were then constantly followed by the coordination team (teachers, customer and companies) in the production of 4 collections. Professors acted as discipline references, guiding students through project themes related to service, product, or fashion. Discussions alternated between whole team reviews and discipline-specific reviews. This ensured

horizontal involvement in decisions across different backgrounds while maintaining vertical focus on specific disciplines. The resulting collections integrated creative skills from diverse disciplines, with each design step collaboratively shared. This approach highlighted the systemic and comprehensive nature of uniform design, showcasing how varied sensibilities contributed to a unified outcome. The coordination team facilitated client reviews by managing staff comments and providing constructive feedback to students using evaluation tools.

The four collections produced tangibly represent the outcome of this multidisciplinary and multi-stakeholder relationship (Fig. 02): the fashion product, designed in detail and visualizable not only through sketches but also through a digital representation of it in the form of an animated fashion show, was associated with new luggage accessories and equipment products to facilitate and make staff activities more pleasant, and each of the projects proposed services both to improve the process of supply or use of uniforms and to implement processes useful for the well-being of workers. The complexity of the projects implemented makes it clear that a company's request was not given an unambiguous answer but an opening to further avenues that can be further elements of deepening, development, and design.

DISCUSSION

The four uniform collections for Trenitalia Tper staff, demonstrate the efficacy of multidisciplinary and multi-actor learning and collaboration models (Fig.03). This approach integrates industrial practices into education, fostering a community of future designers adept at navigating the supply chain and attuned to transformation and sustainability. The model serves as a blueprint for university-business collaboration and multilevel learning. Faculty and businesses bring real-world design, research, and production issues to students. Students, from diverse backgrounds, exchange skills and tools in a peer-to-peer manner. The commissioning company gains awareness of contemporary issues like sustainability and digital transition. Scalability hinges on thematic research and selection by the coordination group. Themes such as gender issues, circular and sustainable materials, and worker well-being were added to address the complexity of the product. The aim was to showcase the multidimensional nature of the uniform, incorporating fashion, accessories, and
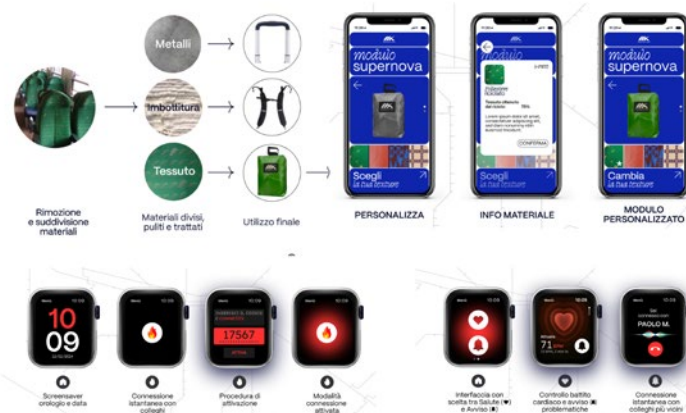
Fig. 2

services across disciplines. Continuous collaboration fosters staff understanding and cohesion, aiding in the development of shared outputs. However, limitations exist, such as the blended working mode due to distance between universities. While main advancement moments occurred in person, more face-to-face interactions could enhance activities like material selection and staff interviews, improving the scalability of the process.

CONCLUSIONS

In conclusion, this paper has successfully illustrated the implementation of a multidisciplinary and multistakeholder learning and collaborative model that effectively bridges the gap between academia and the business world. The case study of the collaboration between the Advanced Design Unit research group, Polytechnic University of Milan and Trenitalia Tper, in conjunction with local fashion and design entities, has not only showcased the potential of collective intelligence in design-driven innovation processes but has

also demonstrated its practical application in a real-world setting. This model has proven that involving a diverse group of stakeholders in the co-design process can lead to innovative solutions that address complex challenges in the contemporary fashion system, particularly in the technical clothing and uniforms sector. The successful integration of academic knowledge with industrial production capabilities emphasises the relevance of open innovation as a strategy for enterprise innovation readiness and systemic industry transformation. The implications of this research extend beyond the immediate project outcomes. They suggest a scalable and replicable framework that other sectors can adapt to foster similar collaborative innovations. The involvement of students and faculty in these real-world projects not only enriches their learning experience but also prepares them to enter the workforce with a practical understanding of industry challenges and the dynamics of collaborative innovation. Future research could explore the longitudinal impacts
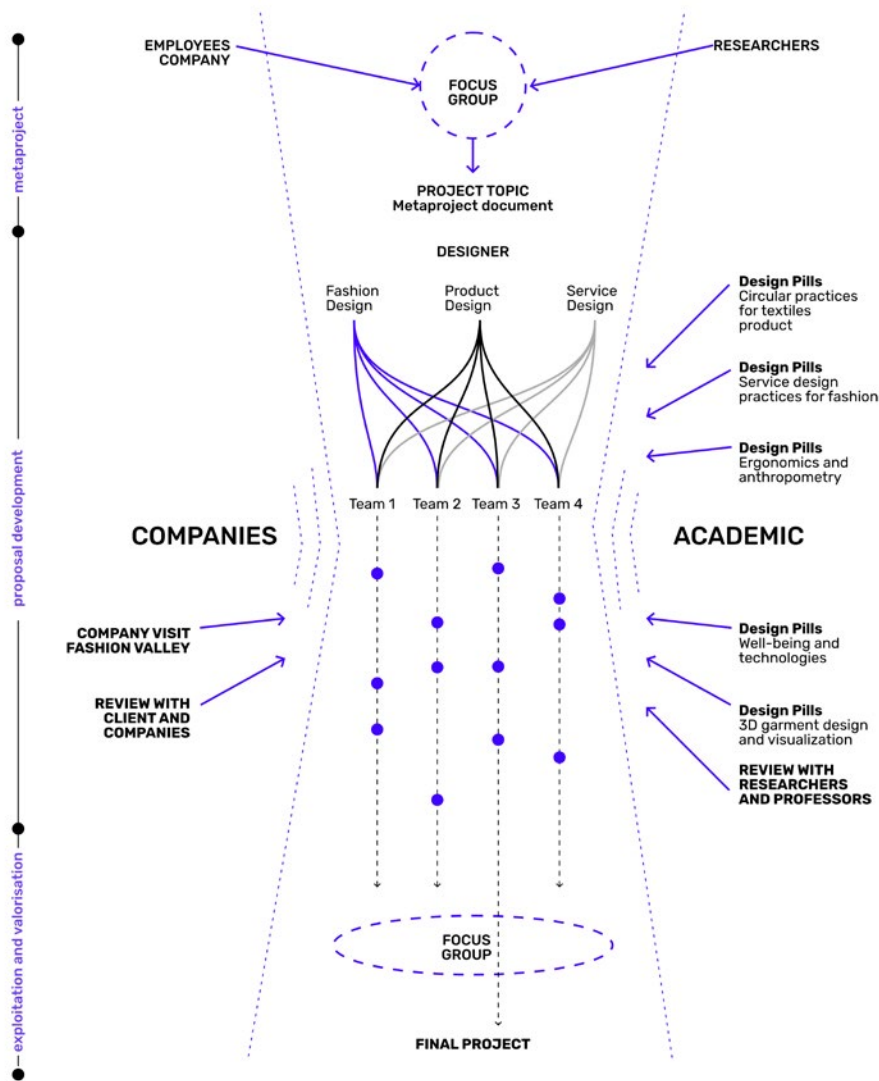
EMPLOYEES COMPANY

RESEARCHERS

FOCUS GROUP

PROJECT TOPIC
Metaproject document

DESIGNER

Fashion Design   Product Design   Service Design

Design Pills
Circular practices
for textiles
product

Design Pills
Service design
practices for fashion

Design Pills
Ergonomics and
anthropometry

Team 1   Team 2   Team 3   Team 4

COMPANIES   ACADEMIC

COMPANY VISIT
FASHION VALLEY

REVIEW WITH
CLIENT AND
COMPANIES

Design Pills
Well-being and
technologies

Design Pills
3D garment design
and visualization

REVIEW WITH
RESEARCHERS
AND PROFESSORS

FOCUS GROUP

FINAL PROJECT

metaproject

proposal development

exploitation and valorisation

Fig. 3

of such collaborations on the participants and the industries they engage with, potentially leading to further refinements of the model. Additionally, expanding the scope of these collaborative efforts to include more diverse industries and comparing the outcomes could provide deeper insights into the universal applicability and effectiveness of this model. By fostering a culture of continuous learning and adaptation, the model outlined in this paper promises to contribute significantly to the ongoing discourse on the convergence of education, research, and business, ultimately driving forward the frontiers of innovation in design education and beyond.

ACKNOWLEDGEMENTS

CAPTIONS

[Fig. 01] Project timeline. Credits: Ludovica Rosato.

[Fig. 02] Selection of images from one of the collections developed. Project credits: Federico Primosa, Michelle iezzi, Marco Fiore, Stefania Morandi, Graphic layout: Ludovica Rosato.

[Fig. 03] Summary diagram of the disciplines and actors involved in the learning and collaborative model tested. Credits: Giorgio Dall'Osso.

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