

Fedosov A., Boos D., Schmidt-Rauch S. Ojala J., and Lewkowicz M. (2021): Challenges of transferring UX designs and insights across products and services. In: Proceedings of the 19th European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centred Computing on the Design of Cooperation Technologies - Exploratory Papers, Reports of the European Society for Socially Embedded Technologies (ISSN XXX-XXXX), DOI: 10.18420/ecscw2021-to-be-added

Challenges of transferring UX designs and insights across products and services

Anton Fedosov¹, Daniel Boos², Susanne Schmidt-Rauch³,
Jarno Ojala⁴, Myriam Lewkowicz⁵

¹University of Zurich, Switzerland; ²SBB Swiss Federal Railways, Switzerland;

³evux AG, Switzerland; ⁴Vincit Oyj, Finland; ⁵Troyes University of Technology,
France

*antonf@ifi.uzh.ch, daniel.boos@sbb.ch, susanne.schmidt@evux.ch,
jarno.ojala@vincit.com, myriam.lewkowicz@utt.fr*

Abstract. The increased popularity of UX design practices in the industry led to the creation of more usable, useful, and enjoyable digital products and services. Nonetheless, the scope of the UX efforts generally concerns a *single* product or project under development. In this workshop, we call for the shift beyond a single product paradigm towards a more ecosystemic approach in UX design to create long-lasting, reusable, and transferable UX artifacts. Gathering a group of scholars who are interested in UX processes at work, and UX practitioners, leaders, and managers, we aim to synthesize the current state of the discussion to create a UX research agenda for designing integrated digital work environments, unpacking development, users, and change perspectives to aid knowledge transfer across projects and overtime.

Copyright 2021 held by the Authors, DOI: ...

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, contact the Authors.

Introduction

The increasing digitalization of work practices naturally leads to increased use of applications and digital services to perform work. Therefore, employees have to face the constellations of different communication and reporting tools to support their tasks at hand, in addition to the main tools used to perform those tasks. For example, a member of a Swiss train crew uses a dozen apps to perform their work: a ticket checking app, railway maintenance apps, regulation repositories, intranet apps, a personal planning app, a timesheet app, a rail traffic management app, etc. A shunter operates multiple devices e.g., a smartphone, radio, specialized communication devices, and even several physical objects to coordinate and perform their work. In many cases those applications and devices are not well aligned with each other and, hence, gaps exist between the applications to ensure effortless completion of the desired user goal (e.g., challenges of transferring data among apps to serve a train passenger). Those gaps have often been managed by the workers, causing additional work, breakdowns, errors, slow adoption of new tools, fatigue, and, ultimately, workers' stress.

Several factors may contribute to this situation. First, applications usually come from various vendors or have been designed and developed during different projects, by different contractors. Despite that the orientation to the design for end-users may have gained recent popularity within the enterprise software sector (Sheppard et al., 2018), their UX efforts are merely focused on just *that single* product under development, rather than anchoring the UX culture within the organization (Boos and Horvath, 2020). The main objective of those efforts concerns how to make the application usable and useful on its own and not about how it is integrated into an existing company's infrastructure with a myriad of tools in the corporate software ecosystem and established work practices. Second, widespread agile methodologies emphasize an iterative, incremental approach for software development, and thus do not necessarily allow for comprehensive upfront analysis of complex work environments. Oftentimes, however, employee-centered issues in these environments cannot be fixed by a small sprint iteration within an agile cycle (e.g., tweaks to a UI). Third, the products are frequently rolled out and deployed by different teams (e.g., external consultants, IT) and organizations in large enterprises. Those teams may pursue different, at times even conflicting, objectives. Finally, drawing upon our own broad experiences in the industry, formative evaluations, e.g., work systems analysis, are conducted before deploying a product, however, any learnings are just used for *that particular* product and not

for other related products in the portfolio. We also noticed that the translation of research insights to design, and to requirements is hardly supported by contemporary tools and, hence, remains opaque. Consequently, we observe the emergent challenges of longevity and connectivity of (UX) design artifacts when it comes to both handing over the project from one team to another, and across projects within a team.

That marks a salient motivation for our workshop.

In this workshop, we aim on unpacking contemporary learnings and challenges of transferable UX design and insights across multiple products and services. We ask: “*How can we depart from a paradigm of designing a single product and turn to the holistic UX design approach at work?*” With the fact that many collaborative enterprise applications were developed and deployed over time, we see the value and the need to effectively integrate those apps within existing software ecosystems and work practices. Instead of focusing on *a product*, we call UX researchers and practitioners to center on an ecology of artifacts (Bødker & Klokmoose, 2012), e.g. a portfolio. This, in turn, may help to improve existing and to develop new large-scale software systems, where many actors need to effectively coordinate their actions (e.g. a railway traffic management system, infrastructure maintenance, production systems in factories, healthcare trajectories of patients). That, ultimately, may lead not only to improved quality of work and create pleasurable experiences for their end-users, but also establish a ground for successful company-wide collaboration when it comes to preserving and transferring UX insights and rules.

Background

Prior work examined how user-centered design (UCD) processes can be effectively adopted in large organizations and complex projects with multiple stakeholders. CSCW has a long tradition looking at how to improve coordination and collaboration of various stakeholders within large-scale technical projects e.g., through co-creating, co-editing, sharing, linking, and archiving project documentation and materials in highly dynamic, event-driven environments (Grønbaek et al., 1992). Thamhain (2011) concluded that effective collaboration among different teams is crucial within complex technology-intensive product development. He argued that the project leaders should recognize the organizational and cultural differences of all contributing organizations to create “a

true partnership among all the stakeholders with strong linkages for communication, decision making, and technology transfer” (Thamhain, 2011).

Iivari and Abrahamsson (2002) studied the implementation of the UCD processes within software development environments. They concluded that different organizations’ subcultures (e.g., usability specialists, software engineers, managers) consider the nature, the role, the interpretation, the success criteria, and the benefits of implementing the UCD processes in the organization differently. They emphasized the importance of early identification of incongruence in views of UCD techniques and expectations concerning its implementation. Those can be clarified and agreed upon a shared vision during initial projects’ stakeholder meetings.

Furthermore, based on a set of case studies Junginger (2005) provided insights on how methods of human-centered product development can be applied in a project that involves a large system problem and a complex organization. She argued that to reap the benefits from UCD in an organization, it requires that both design managers and designers rethink their concept of “product”. One way to think about it is to consider the organization as a product in itself and subsequently design an organization (or user-centered organizational culture for that matter). To do so the design needs some C-suite supporters to climb up the organizational ladder, away from focusing narrowly on product development aspects to influencing and guiding an organization’s design strategy and culture.

Next, Hauser (2007) offered some strategies and tactics on how to institutionalize the UCD process within a large organization. This include (a) establishing shared goals between product managers and UX designers; (b) providing a description of the UCD processes and scaffolding easy-to-use examples; (c) defining clear responsibilities across organizational boundaries; (d) setting up pilot projects involving developers, product managers, designers; (e) using project participants as proxies to spread the word about the values of UCD in their teams; (f) providing opportunities for training and coaching; (g) defining use cases as mandatory project deliverables; and (g) establishing quality control routines. UX leads need to create opportunities for win-win situations among the teams to make the UCD process stick. Once UX leaders implement the UCD processes within the organization, it requires *continuous* support and nurturing. Our workshop concerns how to go *beyond* a single project towards changing organizational mindsets with respect to UCD and establishing a holistic view of the stakeholders’ needs.

Boy (2012) synthesized several perspectives on effectively using UCD in large-scale organizations. He related that to managing complexity, maturity reaching in design, product integration in large organizations and provided examples from the aerospace industry (e.g., air traffic management and control systems). He further argued (Boy and Narkevicius, 2014) that holistic approaches to systems engineering are often failing due to the complexity of the highly-interconnected large organizations. UCD can provide the necessary creativity to embrace complexity rather than avoid it. Modeling and simulation approaches from UCD are considered to be effective strategies, thus, can be employed not only in the early stages but also throughout the product life cycle, and can shape human-systems integrations and create better socio-technical systems. Ultimately, Boy (2017) defined properties of a complex system: a large number of components and interconnections, many people involved in the life cycle, emergent behaviors and properties are not anticipated, adaptability issues, and unpredictability. He also referred to the work of Grudin (1994), and Norman and Stappers (2016) who discuss complex socio-technical systems from people and technology perspectives.

In parallel, there were efforts in adapting UX into popular agile approaches to software development (Beyer, 2010; Kuusinen et al. 2012; Larusdottir et al. 2018). Furthermore, Heimgärtner (2020) developed an assessment model for UCD processes and exemplified its usage. Recently, within the community of practitioners, we notice the emergence of a number of UX research approaches such as ResearchOps¹ and Atomic Research², which aims to operationalize and to streamline the user research practices within a company and increase their impact through e.g., quality standards, standardized processes, the use of established toolkits or frameworks. These efforts show a promising avenue for a more consolidated approach to employ and to transfer UX and user research insights across various products and services over time. What is more, these initiatives inspired the creation of collaborative repositories (e.g., Glean.ly), and thus can be seen as a first attempt to go beyond a single product mindset towards applying UX practices at scale.

This interest in comparing projects or interventions is close to the work that has been developed around grounded design (Rohde et al, 2017) through the realization of design case studies (Wulf et al., 2011). In order to allow a comparative analysis of design case studies across domains, and the building of concepts, Li and

¹ <https://researchops.community>

² <https://blog.prototypr.io/what-is-atomic-research-e5d9fbc1285c>

colleagues (2020) suggested the idea of an e-portfolio. Furthermore, Wulf et al. (2015) outlined the most prominent cross-cutting issues in that space:

- The appropriation work that is needed to build the interaction between the technological system and the social system. This leads to reflections about tailorability and sharing of experiences among users.
- The ways to conduct the end-user development process in order to be agile and to adapt to ever-changing requirements and environment.
- The fact that technology should be transformative, which could lead to some evolution of practices. The question is then how to ensure that the development of practice and technology are integrated.

Our workshop looks into unpacking the challenges and opportunities when it comes to adopting such portfolio initiatives within and across organizations and product teams beyond a single product development life-cycle.

Themes and Topic Areas

The workshop will explore the following topical areas when it comes to generating cross-project knowledge within large-scale organizations. Those topics are interrelated, however, they may help us to distinguish between different elements of our overall goal of the workshop to unpack learnings and challenges of transferable UX design and insights across multiple products and services.

Development view: integrating UX early on and throughout the development

The development view emphasizes the actual processes and practices that lead to a new service or a solution. Contemporary UX approaches need to fit with those fast-paced development practices (e.g., agile methods). Therefore we inquire:

- How might we adapt our user insights and recommendations to the particular stage of the development of a new solution and the different involved contributors (e.g., portfolio manager, enterprise architect, agile team)?
- How might we do it within the popular agile approaches for development (e.g., Scrum) and their design adaptations (e.g., Lean UX)?
- How might we collect and share user insights to design new work environments that combine and integrate multiple products at once?

Worker view: designing for the end-user considering a myriad of tools

We argue that end-users struggle with not only the myriads of existing tools but also continuous changes in their work processes often introduced with those new tools. Therefore we prompt participants:

- How might we design integrated digital environments, where several products are well aligned from a user and group of users' perspectives?
- How do we take issues, such as awareness, safety, accessibility, usability, and worker well-being, into account before, during, and after the introduction of a digital solution into a workplace with many other parallel solutions and workarounds?
- What kind of design research approaches may foster a more holistic and systemic view?

Change view: adopting new forms to communicate, coordinate and collaborate

Companies undergo the ongoing processes of change, which particularities need to be addressed during the deployment of a new solution. We propose to discuss learnings around:

- How might we better design the change process from one socio-technical work system to a new socio-technical system, without having a final view from the outset?
- How might we take into account companies' organizational culture?
- How might we incorporate the re-design of the collaborative practices and related team-work in the design process of a new digital system in a given environment we design it for?

Goals of the Workshop

The goals of the workshop are to:

- bring together and encourage collaboration not just between academic researchers, but also with UX design managers and practitioners navigating complexity within large-scale projects when it comes to UX knowledge transfer;
- review and scaffold existing strategies and practices to support the transfer of UX knowledge “from the field” to the level of decision-makers (e.g., managerial level, policymakers);

- gather a diverse community of scholars, designers, human factor specialists, and product managers to collect a set of hands-on strategies and tactics valuable in the different levels of product decision-making voicing the perspectives of different stakeholders;
- aim to synthesize stakeholders' perspectives to create a research agenda for designing integrated digital work environments, where applications from different solution providers are well aligned to an end-user perspective, with a particular focus on the interdependencies between ongoing and envisioned projects.

Activities and Structure

We propose a half-day, 4-hour online workshop with up to 20 participants from academia and industry. In the workshop, we will combine a discussion of the position papers with hands-on activities around the selected set of case studies.

Prior to the workshop: We will circulate the accepted participants' position papers and case studies with a view of collecting critical questions based on the theme of the workshop.

Convene and introduction (60 min): The organizers will kick-off the workshop with a brief presentation of the agenda, goals, and format. They will then moderate a short round of flash presentations, providing each participant an opportunity to introduce themselves, their research interests and thoughts stemming from their position paper.

Large group discussion (45 min): The organizers will present the emergent challenges of transferable UX (based on the prior art as well as our own experiences) and introduce themes of the workshop. Participants will contribute to the discussion by revisiting relevant prior research and case studies, and suggesting any outstanding perspectives in addition to those we have initially outlined. This phase will generate material for the subsequent break-out group activity.

Break (30 min)

Breakout groups (60 min): Participants will be split into smaller groups (4-5 people) based on research interest and prior experience in each topical area. The goal is to identify distinctive opportunity areas and formulate detailed questions as to how CSCW/HCI research and practice can support the transferability of UX when it comes to product and service design beyond a single product cycle. The

facilitators will ensure that the groups are composed of both academic and UX practitioners and include early career researchers and graduate students.

Synthesis and Next Steps (45 min): The workshop will conclude with a group discussion reviewing what has been achieved from the breakout groups and outlining steps for further collaboration.

Organizers

Anton Fedosov, Ph.D. is a postdoctoral interaction design researcher at the People and Computing Lab at the University of Zurich in Switzerland. His research interests lie at the intersection of social aspects of ubiquitous computing, collaborative economy, and user experience design of interactive systems and services. Prior to his engagement with academia, Anton was working in applied research groups in the mobile industry in large companies in North America, Western Europe, and Japan.

Daniel Boos, Dr.sc ETH leads the User Experience team at the Swiss Federal Railways. He has strong practical experience in user research, socio-technical system design, and digital transformation. For more than a decade, he applied UCD approaches in organizations to increase their user-centricity and to improve the UX of their products and services. He co-organizes the Design Leadership Therapy, a platform for design leaders and managers, which discusses emergent challenges of how to practice leadership in companies building their design culture.

Susanne Schmidt-Rauch, Dr. Inform. is co-founder and C/UX consultant at evux AG, a Zurich-based UX consultancy firm. From her early doctoral studies at the Information Management Group at the University of Zurich focussing on CSCW, she incorporates human-centered research and design practices to software development processes into both waterfall and agile models. She facilitates the Swiss interest group on financial advisory support systems. One of her interests in research and practice is the transfer of scientific CSCW knowledge to organizational practice.

Jarno Ojala, Ph.D. is a lead UX researcher and designer at Vincit, a large service design and software development and consultancy company founded in Finland. His design and research interests include accessible and universal design, CSCW, and the sharing economy. One of his interests is to incorporate best practices into

design and development projects with varying clients, products, and different sizes of development teams.

Myriam Lewkowicz is a full professor of Informatics at Troyes University of Technology (France), where she heads the multidisciplinary research group Tech-CICO. Her research involves defining digital technologies to support existing collective practices or to design new collective activities. From 2020 she chairs the European Society for Socially Embedded Technologies (EUSSET).

Maximum Number of Participants Expected

We envision bringing together up to 20 participants from academia and industry. Our intended audience is primarily HCI and CSCW researchers who are looking at the breadth of design processes across UX teams, UX architects, who are working on large-scale projects in the industry as well as human factor experts. We will also encourage graduate students to participate in the workshop, who can be interested in developing their careers in the UX industry.

Participants Selection

Participants for the workshop will be recruited from the (E)CSCW community, attendees of previous workshops on the related topics (e.g., Christensen et al. 2020), and the extended research networks of the workshop organizers. We distribute the call for participation using the CSCW-related mailing lists (e.g., EUSSET, CHI-Announcements) as well as UX practitioners listservs (e.g., UX Schweiz, EuroIA) and specialized Slack channels (e.g., IxDA, ResearchOps). To promote broader participation from UX practitioners, product managers, and human factors experts, we offer the option of submitting alternative material in the form of a short case study, a white paper, a design portfolio, or alike.

References

- Beyer, H. (2010): 'User-centered agile methods', *Synthesis lectures on human-centered informatics*, vol. 3, no.1, pp. 1-71.
- Bødker, S., & Klokrose, C. N. (2012): 'Dynamics in artifact ecologies', In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*, pp. 448-457.

- Boos D. and Horvath, P. (2020): 'Was es wirklich bedeutet, User Experience im Unternehmen zu verankern', Retrieved December 22, 2020 from <https://www.swissict.ch/was-es-wirklich-bedeutet-user-experience-im-unternehmen-zu-verankern/>
- Boy, G. (2012): *Orchestrating human-centered design*. Springer Science & Business Media.
- Boy G. A., Narkevicius J.M. (2014): 'Unifying Human Centered Design and Systems Engineering for Human Systems Integration', in: Aiguier M., Boulanger F., Krob D., Marchal C. (eds) *Complex Systems Design & Management*. Springer, Cham
- Boy, G. A. (2017): 'Human-centered design of complex systems: An experience-based approach', *Design Science*, vol. 3.
- Christensen, L. R., Erickson, I., Harper, R., Lewkowicz, M., & Nauwerck, G. (2020): 'Why Do CSCW Insights Lose Out to Management Intuitions?' In *Proceedings of 18th European Conference on Computer-Supported Cooperative Work, Reports of the European Society for Socially Embedded Technologies* vol. 4, no. 2
- Grønbaek, K., Kyng, M., & Mogensen, P (1992): 'CSCW challenges in large-scale technical projects—a case study'. In *Proceedings of the 1992 ACM conference on Computer-supported cooperative work*, pp. 338-345.
- Grudin, J. (1994): 'Computer-supported cooperative work: history and focus.' *Computer*, vol. 27, no. 5, pp. 19-26.
- Heimgärtner R. (2020): 'Development of an Assessment Model for the Human Centered Design Processes Specified in ISO 9241-220', in: Kurosu M. (eds) *Human-Computer Interaction. Design and User Experience. HCII 2020. Lecture Notes in Computer Science*, vol 12181. Springer, Cham
- Hauser, A. (2007): 'UCD collaboration with product management and development', *interactions*, vol. 14, no. 3, pp. 34-35.
- Iivari, N., & Abrahamsson, P. (2002): 'The interaction between organizational subcultures and user-centered design—a case study of an implementation effort'. In *Proceedings of the 35th Annual Hawaii International Conference on System Sciences*, pp. 3260-3268. IEEE.
- Junginger, S. (2005): 'A different role for human-centered design within the organization', *Design System Evolution Proceedings*.
- Kuusinen, K., & Väänänen-Vainio-Mattila, K. (2012): 'How to make agile UX work more efficient: management and sales perspectives'. In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*, pp. 139-148.
- Larusdottir, M. K., Nielsen, L., Bruun, A., Larsen, L. B., Nielsen, P. A., & Persson, J. S. (2018): 'UX in Agile before and during development', In *Proceedings of the 10th Nordic Conference on Human-Computer Interaction*, pp. 984-987.
- Li, Q., Tolmie, P., Weibert, A., Schorch, M., Müller, C., and Wulf, V. (2020): 'E-Portfolio: value tensions encountered in documenting design case studies', *Ethics and Information Technology*.
- Norman, D. A., and Stappers, P. J. (2015): 'DesignX: complex sociotechnical systems', *She Ji: The Journal of Design, Economics, and Innovation*, vol. 1, no. 2, pp. 83-106.
- Rohde, M., Brödner, P., Stevens, G., Betz, M., and Wulf, V. (2017): 'Grounded Design—a praxeological IS research perspective', *Journal of Information Technology*, vol. 32 no. 2, pp. 163-179.
- Sheppard B., Sarrazin H., Kouyoumjian G., and Dore F. (2018): 'The business value of design', *McKinsey Quarterly*, Retrieved January 7, 2021 from <https://www.mckinsey.com/business-functions/mckinsey-design/our-insights/the-business-value-of-design>
- Thamhain, H. J. (2011): 'The role of team collaboration in complex product developments', In *2011 Proceedings of PICMET'11: Technology Management in the Energy Smart World (PICMET)*, pp. 1-7. IEEE.

- Wulf, V., Rohde, M., Pipek, V., and Stevens, G. (2011): 'Engaging with practices: design case studies as a research framework in CSCW', In *Proceedings of the ACM 2011 conference on Computer supported cooperative work*, pp. 505-512.
- Wulf, V., Müller, C., Pipek, V., Randall, D., Rohde, M., and Stevens, G. (2015): 'Practice-based computing: Empirically grounded conceptualizations derived from design case studies', In *Designing socially embedded technologies in the real-world*, pp. 111-150.