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Abstract: This paper examines the design of a digital platform supporting sustainable food transformation across six European regional Hubs. Through multi-phase participatory evaluation involving contextual inquiry across culturally diverse contexts, responsive redesign, and formal usability testing, we identify a fundamental tension between technical standardization and cultural adaptation. While formal metrics demonstrated strong usability and aesthetic appeal of our platform design, Hub-based evaluation revealed that participants' requests for regional adaptation such as representing traditional production methods, biodiversity, and place-specific sustainability logics challenged fundamental platform assumptions about capturing food knowledge in standardized structures. We articulate emergent design principles including minimizing barriers while maintaining community identity, prioritizing integration over substitution, and facilitating knowledge circulation rather than data collection. Our findings suggest that meaningful transformation requires reconceptualizing platforms as distributed infrastructures that enable local adaptation while maintaining cross-regional knowledge exchange.

Keywords: digital platform; sustainable food systems; design process; participatory evaluation

1. Introduction

Contemporary food systems must balance food security, environmental sustainability, and human well-being through approaches that integrate health, agriculture, ecological impacts, economic viability, and socio-cultural factors (Alsaffar, 2016; Fanzo & Miachon, 2023). This challenge calls for interventions that can support both individual dietary choices and systemic change across diverse cultural and institutional contexts (Biesbroek et al., 2023). Digital platforms are increasingly positioned to support such transitions (Marshall et al., 2022), yet their design often presumes universal user needs, overlooking how food practices are embedded in cultural landscapes, local identities, and traditions (Bos et al., 2015).

This paper presents the case of the SWITCH Project, developed as part of a European Commission Horizon Europe initiative to support sustainable and healthy dietary transitions.



The project centres on six regional Hubs: living labs spanning diverse territories from Northern to Southern Europe. Each Hub operates as a city-region food system (Building Sustainable and Resilient City Region Food Systems, 2023) that engages multiple stakeholders - citizens, chefs, policymakers, producers, educators, and researchers - in co-creating and evaluating innovations for dietary transformation. Our role in SWITCH is to design a digital platform that serves dual audiences: available openly to all Europeans while providing Hub-specific features and content tailored to regional contexts. The platform looks to connect diverse stakeholders across different cultural backgrounds, regional food systems, and expertise levels to maintain regional identity and local relevance while enabling broader systemic impact through cross-regional knowledge exchange.

We report on the development of the platform's first functional prototype through preliminary stakeholder inquiry followed by two evaluation phases with intermediate redesign: (1) participatory inquiry across regional Hubs to surface context-specific needs and (2) formal usability testing to assess interface usability and aesthetics.

This paper contributes to design research on platform-based cultural transformation in three ways. First, we demonstrate how multi-phase participatory evaluation methods - combining contextual inquiry with standardized usability testing - can surface culturally specific needs and design insights. Second, we identify a fundamental standardization-localization tension: participants' requests for regional adaptation challenged core platform assumptions, revealing architectural conflicts between scalability and cultural specificity. Third, we derive emergent design principles for culturally grounded transformation platforms. We present these principles not as universal solutions but as context-specific responses involving trade-offs between competing values.

As this represents an intermediate phase of an ongoing project, the analysis acknowledges both methodological opportunities and limitations in addressing the broader challenges of designing for cultural food transformation. The continuing project timeline provides opportunities to develop more collaborative approaches and explore whether the design principles identified can effectively support long-term cultural change.

2. Related work

2.1 *Participatory design for food system transformation*

Food occupies a distinctive position in transformation-oriented design research, simultaneously embodying tangible sustenance and cultural identity, individual dietary choices and collective practices, stability and adaptation (Dolejšová et al., 2020; Juri et al., 2022; Katzman et al., 2025). Unlike other design domains, food practices are inseparable from cultural meaning-making (Boncompagni et al., 2025): what counts as "good food" or "sustainable eating" varies across cultural contexts (Pryor et al., 2024). Moreover, food knowledge is often tacit, embodied, and learned through experience rather than formal instruction (Fonte, 2008). Food practices continuously adapt, creating hybrid cultural identities while maintaining connections to place-based knowledge systems (Daou & Sarantou, 2026; Zheng & Carter, 2024; Zhou & Hua, 2024). This creates a fundamental design

challenge: supporting transformation while respecting and adapting to the cultural specificity that gives those practices meaning.

Addressing these intertwined dimensions of food systems requires coordinated action across multiple levels and actors. This makes participatory, cross-sector collaboration essential for sustainable transitions (Borsellino et al., 2024; Marti et al., 2023; UNEP et al., 2023).

Participation must engage diverse stakeholders - farmers, policymakers, communities - in co-creating solutions that foster a shared language, mutual learning, and a sense of ownership (Béné et al., 2024; Ciaccia et al., 2019). Related human computer interaction (HCI) work on infrastructuring shows that sustaining such collaboration depends on relationships negotiated over time and anchored in socio-material contexts (Prost et al., 2019). Through collaborations between academic and non-academic actors (Wopereis et al., 2024), participation can address power imbalances and ensure transformative pathways for all actors, not just dominant groups (Borsellino et al., 2024). Nonetheless, an acknowledgement of local power dynamics and social hierarchies is critical as designers often occupy powerful positions whose decisions inherently carry cultural influence and imposition (Merritt & Stolterman, 2012).

The translation from participatory insights to design decisions presents methodological challenges when working in multiple culturally diverse contexts. When designers themselves represent different cultures than participants, the process entails iterative cycles of co-design sessions, reflective analysis, and coding to surface implicit cultural values, worldviews, priorities and identities (Anderson-Coto et al., 2024). In addition, there is evidence that both usability practices and cultural understandings vary systematically across contexts (Sayago, 2023), reinforcing the need to adapt the nature of participation within specific projects rather than imposing predetermined techniques (Wen et al., 2024). Whether digital systems can structurally support the cultural diversity uncovered through participatory methods remains a gap.

2.2 Digital platforms as transformation infrastructure

Digital platforms are emerging as promising interventions for sustainable food transitions, but their development and conceptualisation do not come without challenges. Hedin et al.'s (2019) systematic review of digital behaviour change interventions for sustainable food consumption reveals a field dominated by individual-focused applications that emphasize personal tracking, feedback, and education. These interventions typically assume that providing better information about environmental impacts will enable more sustainable choices. However, information-based approaches show limited effectiveness unless integrated with other policy instruments and structural changes (Ammann et al., 2023). This suggests that platforms focused solely on individual behaviour may inadequately address the systemic dimensions of food transformation. Moreover, integrated approaches that address health and sustainability together, rather than in isolation, show greater promise for meaningful change (Boncompagni et al., 2025).

This tension between individual and systemic approaches reflects a deeper architectural challenge in digital platform design: the conflict between scalability and local context. Light and Miskelly (Light & Miskelly, 2019) demonstrate through a longitudinal study of neighbourhood sharing platforms that while digital systems can facilitate resource exchange at scale, this scalability often undermines the “relational assets” - social bonds, collective

agency, and community trust - that enable sustainable transformation. Their work reveals that locally grounded platforms preserving community relationships may prove more effective for long-term sustainability than standardized solutions optimized for broad reach. Standard platform architectures can embed organizational logics that privilege certain interactions while marginalizing others, despite claims of neutrality (Gillespie, 2010; Plantin et al., 2018). For food platforms, where cultural practices are embedded in local ecologies, these standardization pressures may be particularly consequential. In response, research on digital media ecologies point to the need for "controlled scalability" in food systems; expanding reach while safeguarding the community values and practices that give such systems meaning (Hutchinson et al., 2025). For food transformation platforms that must coordinate action across diverse cultural contexts while remaining responsive to local food practices, this architectural challenge becomes particularly relevant.

Addressing this scalability-locality challenge requires fundamentally rethinking platform architectures. They must facilitate decentralized and participatory decision-making, enhance transparency, and promote collective ownership (Engelbutzeder et al., 2025). Béné et al. (2024) discuss the issue of information overload for non-experts and emphasize the need for simplicity and managed information when creating tools for food system transformation. Indeed, food system dashboards co-constructed with stakeholders can strengthen sustainability while maintaining local relevance when the design manages to synthesize complex systems into a manageable set of key indicators tailored to the country's specific features. Platforms can offer mechanisms to integrate stakeholders, increase transparency, drive data-informed decision-making, and challenge unsustainable norms (Pang et al., 2024). Digital technologies can also function as guidance for sustainable food purchasing, mediators connecting consumers to producers, and tools for reflection through impact visualization (Lindrup et al., 2022).

However, existing research has primarily examined platforms within single cultural contexts or analyzed cross-context platforms without systematic evaluation across diverse food cultures simultaneously. The question of whether unified digital architectures can accommodate sufficient cultural adaptation while maintaining technical coherence - or whether the relational assets necessary for transformation fundamentally resist standardization - remains underexplored.

3. A multi-phased design approach: Methods and outcomes

We devised a multi-stage, mixed-method process to navigate the inherent complexities of designing for food system transformation. A purely quantitative, lab-based approach would have failed to capture the nuances of food practices across Europe. Conversely, a purely qualitative approach would have lacked the usability metrics needed to refine a functional digital interface. Therefore, our methodology was structured as an iterative research journey, starting from preliminary generative research followed by two distinct evaluation phases with intermediate redesign between them. This approach reflects best practice for inclusive prototyping, emphasizing the need to engage diverse user and stakeholder perspectives early in the design cycle (Steinke et al., 2022). The multi-stage and multi-site research was granted ethical approval from the Human Research Ethics Committee of EPFL

(HREC000491) following protocols of Swiss and European Law. Informed consent forms were signed by all participants across the different phases and locations of the study.

3.1 Semi-structured interviews and first prototype

As a first step, we conducted semi-structured interviews with three stakeholder groups: Hub managers (n=4), general citizens (n=15) and professional chefs (n=5) across multiple regions of the project. Hub manager interviews explored organizational activities, data practices, regional characteristics, and platform expectations. Citizen interviews investigated how cultural backgrounds shape food choices, exploring relationships with healthy and sustainable eating, cooking practices, and digital technology adoption. Chef interviews examined professional practices around sustainability, technology use, supplier relationships, digital and social media engagement, and kitchen workflows.

Building on preliminary insights from the interviews and responding to the project brief which defined that we should propose features for chefs, citizens and policy makers, we developed an initial prototype (Figure 1). The proposition includes four core features: (1) a Hub Dashboard providing region-specific content (recipes, events, local food actors); (2) a Food Index database showing nutritional and sustainability data for food items; (3) a Recipe Playground enabling chefs to create recipes with a real-time environmental impact visualization; and (4) a SWITCH Challenge where users logged food intake over five days to receive health and sustainability feedback. This prototype, in the form of an interactive Figma file, was created to serve as a tangible probe to surface context-specific needs and cultural adaptation challenges.

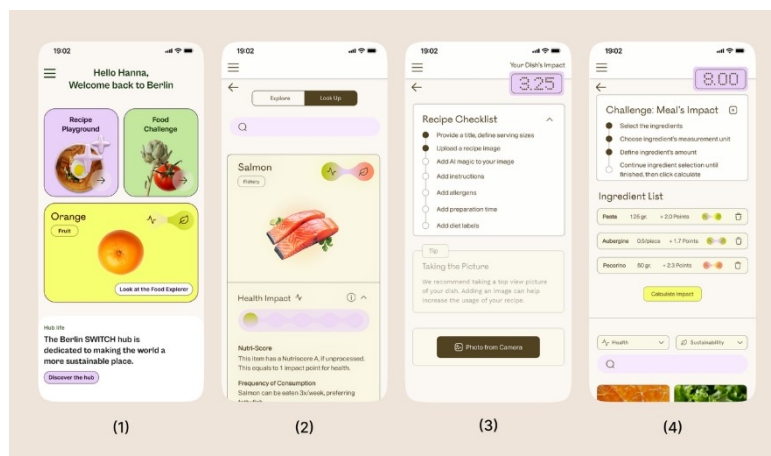


Figure 1 Screenshots of the first prototype core features: (1) Homepage with regional Hub content, (2) Food Index item page, (3) Recipe Playground checklist, and (4) Food Challenge calculation.

3.2 Evaluation phase 1: Participatory inquiry across four hubs

We visited Berlin, San Sebastián, Gothenburg and Cagliari for in-person, situated evaluation. Due to budget and time limitations, we were only able to visit four out of the six hubs, and so the four that were selected were chosen based on availability and language capabilities of our team, but also to ensure maximum cultural and institutional diversity. Berlin, Germany represented citizen-focused sustainability engagement. San Sebastián, Spain provided access

to professional culinary innovation, embodying gastronomic tradition intersecting with contemporary food design. Gothenburg, Sweden offered insights into research-policy integration approaches to sustainability governance. Cagliari, Italy enabled examination of traditional food systems, biodiversity and educational challenges.

Taking place over 3 months, this phase engaged 52 stakeholders across diverse roles and cultural backgrounds (Figure 2). While all visits shared core objectives - surfacing context-specific needs, testing features, and building stakeholder relationships - the specific activities and participant compositions varied to accommodate local institutional structures, cultural practices and practical availability (Table 1). We were therefore seeking qualitative results that could inform an upcoming redesign of the digital platform.

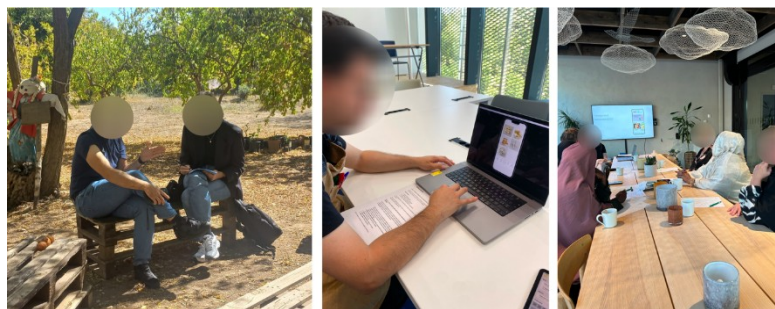


Figure 2 Fieldwork across three regional food hubs: Cagliari, San Sebastián, and Gothenburg.

3.2.1 Methodological approach across hubs

Table 1 Overview of the methods and participants across the Hub visits.

Hub	n	Participant Breakdown	Primary Method	Key Methodological Features
Berlin, Germany	13	12 Citizens with an interest in food sustainability 1 Hub manager	Controlled task-based evaluation	Individual sessions; structured scenarios; usability metrics;
San Sebastián, Spain	8	5 Chefs-research 3 Canteen chefs	Professional contextual inquiry	All attitudes workshop; testing in professional culinary facilities
Gothenburg, Sweden	12	6 Citizens with an interest in food sustainability 6 Hub managers	Dual-format workshops	Separate stakeholder groups; differentiated facilitation approaches
Cagliari, Italy	19	5 School canteen Managers 4 School teachers 3 Citizens with an interest in food sustainability 3 Food producers 2 Local administrators 1 Restaurant chef 1 Nutritionist	Interviews; Distributed ethnographic engagement	Multi-site observation and interviews; event-based recruitment

Berlin: Thirteen participants engaged in individual prototype testing sessions conducted in German at the local Hub facility. Over two days, participants tested two prototypes through structured task-based scenarios: the Dashboard + Food Explorer and the Challenge. Each 30–60-minute session involved participants navigating the Figma prototype on mobile devices while facilitators documented observations and feedback. This controlled approach enabled collection of certain usability metrics (task success, error rates, ease ratings) alongside observations. A follow-up discussion with the Hub manager explored administrative feasibility of proposed features.

San Sebastián: The activities targeted professional chef workflows through a workshop and prototypes. Eight participants - five chef-researchers from a culinary innovation centre and three practicing chefs - engaged in two activities conducted entirely in Spanish. First, a group workshop explored professional attitudes toward generative AI through image comparison and structured discussion, providing context for understanding chef engagement with AI-enhanced features. Second, individual testing sessions examined three chef-focused prototypes (Recipe Playground, Chef Profile) in professional culinary facilities. This evaluation was designed to surface profession-specific concerns about recipe validation, institutional menu constraints, and tensions between professional knowledge and standardized metrics.

Gothenburg: The Swedish evaluation adopted a dual-format workshop structure addressing two distinct stakeholder perspectives. The first two-hour workshop with six Hub team members (university researchers) was conducted in English and focused on Hub representation and administrative feasibility through open discussion rather than structured tasks. The second workshop with six local citizens was conducted in Swedish with interpretation and began with provocations about healthy eating before introducing prototypes. Both used identical materials but adapted facilitation: the Hub workshop emphasized implementation concerns and sustainability, while the citizen workshop explored intuitiveness and engagement.

Cagliari: The Sardinian visit employed distributed ethnographic methods combining semi-structured interviews with participant observation across three days and locations. Nineteen participants representing six stakeholder categories engaged in one-on-one sessions conducted in Italian. Activities included sessions with food producers and canteen managers, a Hub-organized public event launching a school menu initiative, and agricultural site visits. This interview-based approach enabled deep exploration of individual perspectives on regional food systems, institutional constraints, and local practices within their operational contexts.

3.2.2 Findings and prototype redesign

Analysis combined systematic documentation with interpretive qualitative methods. Usability metrics (Berlin) were coded alongside thematic analysis of verbal feedback. Workshop transcripts (San Sebastián, Gothenburg) were analysed for themes regarding professional practice, perceptions, and stakeholder priorities. Field notes from multiple sites (Cagliari) were combined with interview data. Here we provide a synthesized analysis of the four Hub visits, revealing clusters of feedback, and their impact on a comprehensive redesign of the application's information architecture and core functionalities (Figure 3). The

re-design was not a simple bug-fixing exercise but a moment of critical re-evaluation of the platform's architecture.

Chefs in San Sebastián reported workflow inefficiency and terminology issues with the Recipe Playground, and Berlin citizens expressed confusion about its purpose. This led to the whole section being removed and replaced by a manual recipe entry system that would be coordinated by the Hubs. This not only reduced technical complexity but also created an opportunity to strengthen existing relationships between chefs and Hubs and to ensure alignment on the quality and scope of the recipes submitted. As an alternative to the real-time impact score given in the Recipe Playground, the new design introduced the "SWITCH Verdict" feature on recipe pages, which provides a qualitative assessment of the recipe by a SWITCH project expert, offering actionable insights on the environmental and health impact of the recipe.

Participants in Gothenburg, Berlin and San Sebastián emphasized improving the comprehensibility of sustainability data in the Food Index. As a result, complex charts were replaced with simple colour indicators. Similarly, we received consistent feedback across all four Hubs requesting greater transparency about data sources. This was improved in the redesign with the addition of disclaimers and explanations about the provenance and scope of the data provided.

In a similar drive for transparency and inclusivity, Gothenburg advocated for making all features accessible to all user types. In the new design, this led to all user login requirements being eliminated and tools previously aimed uniquely at policymakers were made available to all user types. This also aligned with concerns voiced by Berlin participants regarding privacy of their personal data in a log-in system.

Other feedback challenged the platform's underlying architecture more deeply in their requests for more context-specific content. Responding to the SWITCH Challenge, Gothenburg and Cagliari suggested including age-appropriate educational content so that the tool could be used in specific school contexts. Similarly, when reacting to the Food Index, the Hubs challenged its universal representation of food products; Berlin requested seasonality filters to reflect local growing patterns, Gothenburg wanted to include their own database of fish varieties and Sardinian producers emphasized endemic varieties, traditional production methods, and regional biodiversity. These requests questioned fundamental assumptions about how food knowledge could be captured and represented in a single platform. For example, being based on the SWITCH project's predefined and static database, the Food Index would be unable to include additional varieties or data types depending on the location. In response, the redesign reconceptualizes the SWITCH Challenge as the SWITCH Companion, an adaptive, LLM-powered learning tool. The aim was to complement the more static features of the platform such as the Food Index, with a tool that could accommodate more locally, and contextually adapted information.

Beyond specific features, we observed that different stakeholder groups also revealed divergent theories of how digital platforms enable food system transformation. Hub managers in Gothenburg and Berlin wanted institutional tools like policy dashboards visualizing regional food system data and evidence bases for policy decisions, envisioning transformation through top-down coordination. Conversely, citizens and practitioners valued community-building features like discovering local producers and strengthening social

networks around food. For them, transformation emerged bottom-up through changed practices and collective identities. These divergent interpretations revealed competing theories: platforms as governance infrastructure versus social infrastructure. Rather than resolving this divergence with a specific feature, we treated it as positive tension that steered our approach to become more modular, open and adaptable, to accommodate divergent profiles, viewpoints and requirements.

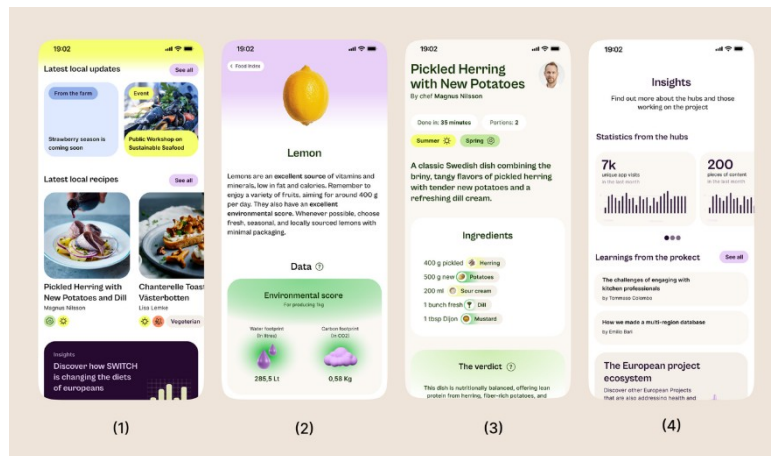


Figure 3 Redesigned prototype: (1) localized home screen with regional content and news, (2) new Food Index visualization, (3) revised recipe interface featuring the qualitative Verdict, and (4) project Insights section linking data and Hub activities.

3.3 Evaluation phase 2: Usability study

Following the redesign, we conducted a formal usability study with the new prototype to complement the contextual evaluation of Phase 1. This phase aimed to formally evaluate the user experience, usability, and visual appeal of the new version of the app through standard UX metrics and user feedback. Additionally, it served to gain feedback from a broader, general audience, because, while the platform was designed for the Hubs and their specific communities, it would ultimately be publicly accessible to wider audiences beyond the immediate project network. We conducted the study with 21 participants at EPFL+ECAL Lab. Participants ranged from 18 to 40 years old (mean = 25.14, SD = 5.93), with balanced gender representation (10 female, 10 male, 1 non-binary) and diverse educational and professional backgrounds. All participants were living in Switzerland.

Participants completed three specific task-based scenarios, such as finding information in the Food Index, and searching for recipes. Following these tasks, participants completed established quantitative questionnaires: the User Experience Questionnaire-Short (UEQ-S) measuring pragmatic and hedonic quality dimensions, the System Usability Scale (SUS) assessing overall usability, and the Visual Aesthetics of Websites Inventory-Short (VisAWI-S) evaluating interface appeal. These standardized instruments provided quantitative benchmarks for design decisions.

3.3.1 Results

Quantitative metrics: The UEQ-S demonstrated positive user responses across both pragmatic and hedonic dimensions. Pragmatic quality received a mean score of 1.55,

exceeding the threshold for "good" evaluation (>0.8) and indicating high usability and efficiency. Hedonic quality scored 1.36, reflecting positive emotional and aesthetic engagement. The SUS yielded a mean score of 77.4, falling within the "Good" usability range and confirming that the platform's core interaction patterns were usable for most participants. The VisAWI-S produced a score of 5.87 out of 7, with 95% of participants rating the platform's aesthetics as "good" - exceeding the 4.5 threshold that typically distinguishes visually appealing interfaces.

Qualitative feedback: Participants consistently expressed appreciation for the platform's community-building potential, with comments such as "The app can really lead to a nice community around healthy and sustainable eating" and "Having Hubs makes you feel special. It's like you are in a community." The visual design received widespread praise, described as "nicely designed, pretty and tidy." Users valued the platform's informative nature and educational focus. However, challenges remained. The environmental information in the Food Index, while seen as innovative and distinctive from other food applications, still presented interpretation difficulties despite the simplified visualization. Participants requested clearer explanations of sustainability scoring systems and found numerical data without reference scales challenging to contextualize. Some navigation uncertainties persisted, particularly around recipe features, though these were less severe than issues identified in Phase 1.

4. Discussion

4.1 *The standardization-localization tension in platform design*

The findings reveal that participants' requests for regional adaptation were not simply feature requests but challenges to core design assumptions embedded in the platform architecture. Most notably, the Food Index's reliance on standardized sustainability metrics assumed that environmental impact could be meaningfully assessed uniformly across diverse European ecosystems and food cultures. However, the evaluation revealed consistent patterns across all Hubs that exposed that this would not be enough to serve their diverse needs. Sardinian food producers emphasized local product varieties and traditional production methods absent from the standardized database, Berlin citizens requested seasonal availability filters, and Gothenburg stakeholders demanded locally relevant sustainability data. These region-specific requests highlighted fundamental limitations in the platform's ability to accommodate the diversity that stakeholders considered essential.

This represents what we characterize as a standardization-localization tension: digital platforms require standardized architectures to achieve technical coherence and scalability, yet meaningful cultural transformation depends on responsiveness to local specificity that resists standardization. Critically, the platform's inability to accommodate these adaptation requests often stemmed from data availability constraints rather than design choices. Regional seasonality information, local biodiversity data, and area-specific sustainability metrics were simply not available within the project scope or existing databases

The standardization-localization tension extended beyond data constraints, as our evaluation revealed that interface language and terminology created confusion across cultural contexts.

Hub managers consistently requested backend access and customization capabilities to add local content like news, events, producer information, and educational materials tailored to their regional contexts. Discussions with Hub managers and policy stakeholders revealed that platform scalability and food policy development applications were seen as essential institutional opportunities, requiring clearer pathways for institutional engagement, enhanced data visualization capabilities, and knowledge-sharing tools for evidence-based decision-making across municipalities and regions.

However, this tension also reveals opportunities for reconceptualizing digital platforms as distributed infrastructure rather than centralized solutions. Instead of scaling through uniform replication, scaling can occur horizontally by spreading locally adapted initiatives and linking them vertically to broader policy and institutional frameworks. The SWITCH platform's continent-wide accessibility and Hub-centric structure represent an attempt at this approach, enabling locally rooted action while facilitating knowledge exchange across regions. By connecting Berlin's citizen engagement initiatives with San Sebastián's culinary innovation and Cagliari's educational integration, the platform creates conditions for horizontal knowledge exchange between local practices.

Yet fully realizing this vision remains constrained by data and architectural rigidity. This exposes a wider challenge for digital infrastructures in sustainability transitions: as seen in the literature, standardization risks marginalizing local knowledge systems that cannot be easily codified. A more resilient design perspective could treat infrastructure not as a finished product but as an evolving system - one that accommodates local variation while maintaining interoperability across regions. Adaptive AI technologies may offer pathways toward this flexibility by enabling dynamic contextualization of standardized data for local contexts (Himeur et al., 2022; Kalpakoglou et al., 2025). Our LLM-powered SWITCH Companion (introduced in section 3.2) explores this potential, providing personalized, location-aware guidance adapted to regional food cultures and seasonal availability. However, AI can reframe existing data but cannot address fundamental gaps in regional representation when that data is missing. The Companion's effectiveness in bridging the standardization-localization tension will be evaluated in future project phases.

4.2 Multi-phase design research methodology

Our methodological approach was key not just for discovering the standardization-localization tension, but for understanding how to navigate it in practice. Our evaluation demonstrates the potential of multi-phase methodological approaches for navigating cultural complexity in design research. The iterative cycle of interviews, Hub-based participatory inquiry, responsive redesign, and formal validation proved effective at identifying cultural differences while maintaining research rigor. This methodology attempted to bridge between deep contextual engagement and scalable evaluation, revealing tensions in this bridging process. While Hub visits generated rich cultural insights, formal usability testing validated interface qualities that contextual inquiry struggled to assess systematically. However, the aspects that made the platform score highly on usability metrics (simplicity, clarity, aesthetics) often conflicted with the cultural adaptation needs that Hub visits revealed as essential for transformation. By purposefully engaging stakeholders from diverse institutional and disciplinary backgrounds (e.g., culinary, education, sustainability) through a sustained, iterative process, it helped nurture cross-

domain relationships and new actor networks. This collaborative structure offered opportunities for cross-sector dialogue and relationship-building, reinforcing the interconnections necessary for systemic innovation and transformative change (Hebinck et al., 2018).

The Hub-based participatory approach revealed its strength in uncovering cultural frameworks that might not emerge through conventional user research methods. By engaging stakeholders in their authentic contexts - culinary laboratories, school canteens, sustainability education centres - the methodology captured insights about how digital tools intersect with existing cultural practices and institutional environments. This contextual depth proved essential for understanding not just what users wanted, but why their needs reflected deeper cultural priorities around food, community, and transformation.

4.3 Rethinking platform design for culturally aware food transformation

The findings from this project suggest that current approaches to designing digital platforms for food system transformation may need a fundamental reconceptualization. By confronting the tension between standardisation and localisation, our process revealed important insights about designing transformation platforms across cultural boundaries. These should not be understood as "solutions" but as responses to specific constraints encountered during development, each involving trade-offs that privilege certain values while sacrificing others.

Minimize barriers while maintaining community identity. The decision to remove user login requirements addressed Berlin participants' privacy concerns, policymakers' institutional access needs, and documented barriers to equitable participation in food platforms (Wang & Barbosa Escobar, 2025), while maintaining Hub-centric content structure responded to Gothenburg's emphasis on local network strengthening and Cagliari's need for community-rooted educational content. This principle navigates the standardization-localization tension by opening access (no login required) while localizing content and identity (Hub-centric structure). Though this approach sacrifices personalization that might enable certain transformative interventions, it prioritises privacy values and community autonomy.

Prioritize linking over recreating functionalities. The Recipe Playground's elimination responded to San Sebastián chefs' feedback about workflow inefficiency but revealed insights about professional integration. The platform's assumption that users would adopt new integrated tools conflicted with existing professional ecosystems and cultural practices around culinary creativity. The shift toward linking external functionalities rather than recreating them represents a more adaptive, integrative approach. This principle emerged from recognizing that transformative platforms may be more effective when they augment existing cultural practices rather than substitute for them, particularly where workflow efficiency carries cultural significance.

Design for knowledge circulation, not just data collection. A transformative platform should facilitate shared understanding. The pivot from presenting raw data (e.g., numerical impact scores) to providing contextualized insights (e.g., the qualitative "SWITCH Verdict" and the "Project Insights" section) reframes the platform's purpose from a data repository to a Hub for circulating actionable knowledge within and between communities. This positions our platforms as facilitators of shared understanding rather than repositories of technical

information, aligning with research showing that information-based approaches support sustainable choices when combined with other policy instruments (Ammann et al., 2023).

These principles also necessitate reconsidering evaluation approaches for transformation platforms. The high quantitative usability scores alongside persistent cultural adaptation requests suggest that conventional metrics may fall short in capturing transformative effectiveness. Success for platforms supporting cultural change should be measured not only by uniform adoption or task completion efficiency, but by capacity to enable local adaptation and preserve the relational assets - social bonds, collective agency, community trust - that transformation requires (Light & Miskelly, 2019). This implies evaluation frameworks assessing platforms' ability to strengthen local food networks and facilitate culturally resonant behaviour change rather than standardized functionality.

4.4 Limitations and future work

This study acknowledges several methodological constraints. The contextual inquiry was limited to four of six project Hubs, potentially missing regional specificities. The methodological contrast between Hub visits and controlled usability testing created an evaluative gap: while quantitative metrics validated interface quality, they lacked the contextual depth necessary for assessing cultural transformation potential. The study's temporal scope also constrains conclusions about long-term cultural change. Food system transformation involves processes that unfold over extended periods; our evaluation captured initial usability but could not assess sustained cultural engagement necessary for transformative impact.

The project's continuing timeline enables addressing these limitations through deeper collaborative approaches where Hubs function as co-design partners rather than evaluation subjects. Future phases could implement Hub-specific customization tools and longitudinal evaluation to assess whether the emergent design principles identified effectively support culturally grounded food transformation.

5. Conclusions

This paper examined the SWITCH Digital Hub Experience, a platform spanning six European food Hubs, to understand how digital infrastructure can support culturally grounded food system transformation. Our multi-phase process reveals that tensions between technical standardization and cultural adaptation represent fundamental architectural challenges, not merely user experience problems. Participants' requests for regional adaptation - representing place-specific biodiversity, embodied culinary practices, and local sustainability logics - challenged core platform assumptions about what food knowledge can be captured in platform architectures.

Our findings suggest platforms intended to support cultural transformation must navigate inherent trade-offs between technical coherence and local specificity. Rather than resolving this tension through universal solutions, future platform design should embrace distributed architectures that enable local adaptation while maintaining cross-regional knowledge exchange, recognizing that meaningful transformation depends on preserving the cultural specificity that gives food practices their transformative potential.

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