“We need an internet connection” – Early exploration of physical/digital spaces for digital transformation

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The case details the application of a systemic, actor-centered design approach to a strategic process of digital transformation in support of industry/research collaboration in one of the administrative regions of southern Sweden. Project mainstays include regional development of “digital leadership”, the creation of a digital/physical competence center, and a larger plan to connect these mainstays to an already established, extremely successful computing- and entertainment-centered yearly event in the main city in the region. Structured around the initial problem space identification and formalization aspects, the case specifically discusses the competence center, what it should be and what activities it should facilitate. It describes the process followed and the results obtained in the divergent stages of the project by means of the early engagement of different stakeholder groups through workshop activities. Preliminary conclusions are drawn in respect to what challenges currently hinder big-scale processes for the design of complex digital/physical environments and the experiences they enable; the relative solidity of adaptive or transformative approaches versus blended space approaches for digital/physical environments; the role and relative weight of “digital” in the organizational context of digital transformation processes.

Keywords: Digital transformation, systemic design, multi-actor approach, blended space

Introduction

The case resides within a large-scale project addressing the digital transformation of small-medium enterprises (SMEs) within the Jönköping region in southern Sweden, and it details one of its main subprojects, the creation of a “digital competence center” (DKC, Digitalt Kompetenscentrum). The project emerged from the notion that competence related to digitization that the local university and an established and extremely successful computing and entertainment yearly event attract should remain in the region and help it, culturally and economically, in its digital transformation journey.

The project, running 2018-2020, is funded with EU funds by the Swedish Agency for Economic and Regional Growth, and sees the collaboration of Jönköping University, through its International Business School and its School of Engineering, and of the regional business incubator, Science Park. Coordinated by a steering group comprising staff from all three organizations, the project is formally compartmentalized along organizational lines in terms of outcomes or subprojects: the Business School is in charge of the creation of “digital leadership” expertise; the School of Engineering of the creation of the DKC; and the Science Park of the more diffusive initiatives for connecting these to the planned growth of the annual computing event in the city.
The authors were not involved in either the writing of the proposal, of the project charter, or the initial planning of the activities for the initial exploration and formalization of the DKC. They were called in roughly four months into the project by the steering group to, upon suggestion from one of the members, to help design and implement the DKC, as they had established competence in the creation of similar physical spaces and in digitalization, and were readily available in-house resources.

**Digital transformation**

The European Commission defines digital transformation as “a fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services”, and states that digital transformation “is characterised by a fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services.” (European Commission, nd). According to the Commission, the digital transformation of traditional sectors of the industry “presents enormous growth potential for Europe”, but currently “EU businesses are not taking full advantage of (...) the collaborative economy” because of disparities across sectors, “between high-tech and more traditional areas”, between countries, between regions within the same country, and between large companies and SMEs (European Commission, nd).

While the global indices for “skills and innovation” in Swedish SMEs are above the EU average (Klingspor & Fortkamp, 2010), the push towards “digital transformation” requires novel competences and a change management mindset that these companies do not currently possess or know how to acquire. For this reason, and because of their number and relevance in the socio-economic fabric of the region, the project primarily targets SMEs and family-owned businesses and addresses their transformation processes at both the strategic and the operative levels. Strategic, through the initiatives connected to the “digital leadership” and “event” subprojects; operative, through the DKC subproject. The project charter also secondarily addresses “other actors that are influenced by the digital transformation of SMEs. The education sector, students, entrepreneurs, and other social actors”.

**The case**

The case details the early stages, post project start, of the DKC subproject in the fall / winter of 2018-2019. It provides an overview of how various negotiations around the design process were managed within the context of a large-scale project where public / private co-production is a key element. It describes the friction between proposal-level goals (create a competence center) and operation-level goals that necessarily include exploration before any formalization can happen. It describes how the authors framed the problem and the early engagement of different actor groups in workshop activities directed at shaping the competence center: what it should be and why, what activities it should facilitate and for whom. It documents the results of the workshops, and the decisional processes connected to advancing the project.

**Theory and methods**

The design process was operatively approached as a co-design activity involving multiple groups of actors (SMEs, researchers, public bodies), and conceptually as a systemic design activity for social change (Stroh, 2005) to be enacted through a digital / physical space (or series of spaces). Organizationally, it was structured via a management-level decision group, not invested with day-to-day operations, a steering group, and the operative DKC group (fig. 2).

The authors introduced the UK Design Council’s Double Diamond model (fig. 1) to frame the design and implementation process in all communications within the DKC group and with the steering group, and explicitly anchored the initial activities to the Discover and Define phases in the first diamond, those often referred to in the practice as “do the right thing” (the second diamond being “do the thing right”). The model allowed for easier alignment of the activities and better communication within the groups.

The Discover and Define phases were then specifically implemented as a set of exploratory workshops with attendees from the primary actor group alternating with reflection and discussion meetings with members of the DKC and steering groups. Communication with the decision group was left to the project manager.
Before the workshops, the authors aligned with ongoing conversations and informally captured through one-on-one meetings and mail exchanges the steering group’s own views of what the space ought to be. In these meetings the DKC was manifested to the authors as being primarily a “showroom”, an exhibit space for “innovative digital products”. Together with the requirements provided in the project charter, these views became the foundation of the prescriptive view of the DKC used to inform the October workshop.

As the DKC was described in the charter as a digital / physical environment, the authors resorted to Horan’s “digital places” (Horan, 2000) and Benyon’s concept of “blended space” (Benyon, 2014) to frame the problem space conceptually.

Horan maintains that digital places are “new leverage points for creating new experiences and relationships that will profoundly redefine our experience of physical space” (p. 23). They “vary in scale and character but share space in both the physical and electronic world”. Digital places are not finite artifacts, “stable end-states”, but “dynamic settings that evolve over time” and as such are constantly emerging as “a continuum of technological integration”. At one end of this continuum, Horan places “unplugged” designs, spaces that manifest little or no digitality. Midway, “adaptive” designs that “modestly incorporate electronic features in physical space”. At the other end we have “transformative” designs: spaces where digital and physical commingle and where digital “influences the layout, program, and infrastructure of the place” (p. 9).

Benyon similarly defines a blended space as a space “where a physical space is deliberately integrated in a close-knit way with a digital space” (p. 79) and whose structure and properties emerge from its specific combination of physical and digital. While Horan’s continuum explicitly looks at the artifact (the space being considered), the concept of blended spaces is structured around human embodiment and human activity: blended spaces are designed with the purpose of creating first and foremost a novel user experience. They instantiate a different sense of “being present” and lead to new ways of interacting.

The digital competence center

The project charter clearly established that the DKC should be an actual physical environment. The various initial project documents and meeting minutes describe it as a space company representatives travel to in
order to participate in unspecified activities connected to collaboration, dissemination, and networking facilitated by technology.

The overall funding structure, what it allocated for building work, and the requirement that the DKC be maintained and further developed by one of the university subsidiaries after the project has run its course, introduced the primary operative constraints. These pragmatically meant that the DKC be located inside an existing building and repurposed spaces, as opposed to a newly-built construction, and that while no punctual architectural specifications nor a location were determined in the project charter, a position on campus or its proximity was immediately established as highly desirable, for reasons of economic and logistic convenience.

The choice to adapt pre-existing spaces made the physical environment of the DKC a difficult starting point for a design based on actual needs and wants as opposed to organizational satisficing based on availability: consequently, conversations with the DKC and steering groups in preparation for the workshops centered on the concept of what “activities” and “experiences” the DKC should support, rather than what “spaces” it should contain.

In terms of the author’s theoretical framework, the project proposal, funding and setup phases clearly envisioned the DKC as an example of Horan’s “adaptive space”, where an already existing space is augmented with discreet digital interventions: teleconferencing tools, screens, computers. In the course of the initiation stage, before the authors were called in, the DKC started to be described as a transformative space, and attention focused on “activities”. During the workshop stage, coinciding with the authors’ engagement with the project and with the divergent phase of the project, the DKC was cast as a blended space to account for the feedback received and the challenges introduced by external and internal actors. Treating the DKC as an element in a larger, region-wide digital / physical ecosystem allowed the authors to resort to methods and tools they previously applied to the design of the studio spaces for Jönköping University and to the analysis of ambient assisted living solutions (Lindenfalk & Resmini, 2019).

The workshops

![Figure 3 Project introduction at the October workshop](image)

The October workshop was held in a separate conference facility on university grounds (fig. 3) in Jönköping. Planned by the authors and facilitated together with two members of the steering group, it registered the presence of 19 attendees from both SMEs and larger private and public organizations operating in the region.

The workshop was conceived as a 2-hour series of hands-on, group activities following a general introduction to the project, to the DKC, and to the goals for the day: explore what activities and what goals the center should support. Attendees were provided a detailed brief. In accordance with the Double Diamond model, the authors identified group exercises focusing on divergent thinking and modified them when necessary to suit the task (Gray et al, 2010). Ideas were to be elicited explicitly and in a way that allowed further subsequent reflection. Informal feedback from attendees was collected after wrap-up.
One of the most immediate concrete results of the workshop was a shift in language, as attendees found the “showroom” concept limiting, and used it sparingly and non-exclusively. This resulted also in a broader focus, with the DKC being diversely characterized as a connecting space, a learning space, and a meeting place.

Workshop attendees identified the DKC with a “space” or “series of spaces” aimed at solving specific problems in these areas, networking, learning, meeting, by providing concrete solutions. Words such as “implement”, “survey”, “measure”, “metric” were used frequently in connection to expected outcomes. A point was made that the DKC should be a “riktningsvisare”, a signpost for digital transformation and development in the region, to help local companies “make the journey” to and beyond digital.

Table 1 Synthetic view of the characteristics associated with the three main roles of the DKC from the October workshop

<table>
<thead>
<tr>
<th>Connecting space</th>
<th>Learning space</th>
<th>Meeting place</th>
</tr>
</thead>
<tbody>
<tr>
<td>both a physical space and a digital space</td>
<td>a place where failings lead to successes</td>
<td>a place where to sit and have coffee</td>
</tr>
<tr>
<td>a place for business</td>
<td>a place where to learn unconventional things that open the way</td>
<td>a place where to book meeting or seminar rooms and hosts events</td>
</tr>
<tr>
<td>a space for showcasing innovative local solutions</td>
<td>a visible space, locally and globally</td>
<td></td>
</tr>
<tr>
<td>a place that addresses how to work with competition between players</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a place where help can be found and ideas shared</td>
<td></td>
<td></td>
</tr>
<tr>
<td>an up-to-date, digital layer that extends the DKC’s physical reach</td>
<td></td>
<td></td>
</tr>
</tbody>
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Communication-wise, the workshop illustrated the digital gap portrayed by the EU Commission in detail. While very clearly discussing and describing a continuous blended space of a/synchronous presence, attendees phrased the DKC in terms of “we need an internet connection” or “I want to see a robot”. Attendees also clearly signaled the importance of directly engaging secondary actor groups, students, instructors, entrepreneurs through the DKC. Nonetheless, it was decided to prioritize the creation of a space that facilitates industry / research collaboration and dissemination, strongly focused on SMEs, to respect the project charter goals. The authors supported the decision as obeying systemic design principles.
intervention on strategically chosen elements within a system, rather than a scattered approach, has proven to be more effective in enacting systemic change (Stroh, 2015).

Based on these outcomes, the authors prepared a preliminary list of desired characteristics that was used as the base input for the subsequent December workshop.

Table 2 Digital competence center: physical and digital elements and characteristics from the October workshop

<table>
<thead>
<tr>
<th>DKC physical space</th>
<th>DKC digital space</th>
</tr>
</thead>
<tbody>
<tr>
<td>manned space, with expert staff and expert workshop facilitators / leaders</td>
<td>physical presence in the competence center should be &quot;one-click&quot; streamable</td>
</tr>
<tr>
<td>reception area</td>
<td>physical presence in the competence center should be &quot;one-click&quot; recordable</td>
</tr>
<tr>
<td>flexible exhibit space</td>
<td>curated web presence</td>
</tr>
<tr>
<td>café corner</td>
<td>curated social media presence</td>
</tr>
<tr>
<td>specialized spaces for meetings, workshops, seminars, and teleconferences</td>
<td>interactive display of cutting-edge digital products and services online and offline</td>
</tr>
<tr>
<td>restrooms</td>
<td></td>
</tr>
</tbody>
</table>

The December workshop was held on the grounds of Campus Värnamo, in Värnamo, Jönköping county. The location was chosen to increase the outreach in the region, and attention was paid to enrolling smaller companies from the area. Both authors facilitated the workshop, which ran activities specifically chosen to build on the results of the October one: attendees were given Table 1 and Table 2 as a starting point and asked to identify challenges and opportunities those activities and spaces suggested.

Figure 5 Introducing the December workshop in Campus Värnamo

Attendees primarily saw the DKC as a direct embodiment of abstract practices, a container, with no precise distinction between its physical and digital spaces, with “information” available “inside”: as a stand-in or avatar for a regional network one can “call on” if necessary to easily pull together resources, receive help with a problem, or acquire the necessary operative and strategic expertise to possibly solve it. Physically visiting the competence center was described as an unnecessary hurdle by many.

The October and December workshops were both filmed in their entirety using a two-cameras setup, with the permission of attendees. All deliverables, notes, posters, sketches, were retained by the authors.

Key learnings and preliminary conclusions

Adaptive and transformative spaces v blended spaces

Preliminary key learnings from this phase of the DKC subproject include how adaptive or transformative space approaches do not provide solid foundations for the design and implementation of digital/physical environments such as the competence center. A blended space approach provides a better fit, but with it
comes the need to consider actor-centered processes as the originator of the ecosystem itself (Resmini & Lacerda, 2016). This is currently a problem because of how the decisional process for large-scale project flows, exacerbated by the fact that the inclusive systemic process it implies is part of what digital transformation sets out to enable in the first place.

**Role and relative weight of digital**

People’s experience of day-to-day processes, from education to travel to healthcare, happens across locations, environments, devices, and freely spans the digital and the physical (Resmini & Lacerda, 2016). Transformation is also a process, and a necessarily pervasive one, but decision makers in the setup stages of the project clearly drew a separation between physical and digital assets and outcomes. This separation impacted the way the project was budgeted and this in turn severely constrains transitioning to a blended space approach.

Such an idea of digital is marketing-driven and fundamentally static and descriptive: a unidirectional tool to document and report in-project organizational progress, or a mere technological aid such as teleconferencing. This also led to the conceptualization problem codified by the DKC as a “showroom”: a largely static if inspirational display of “what’s been done”. As trivial as this might seem, the consequences are vast. Budget cannot be re-accommodated to support digital as a dynamic conversational environment that helps shape the culture of the space. Even the DKC web presence has been framed as an execution problem and not as a community building opportunity that needs steering, resources, continuous nurturing, and appropriate governance.

**Execution v design disconnect**

These issues can be ascribed to a disconnect between the binding constraints introduced at the proposal stages and the reality of a large-scale transformation process. In the case of this project, the disconnect appears to be rooted in a business-centered scaffolding that eschews the socio-technical and systemic complexities of co-creation and of turning ideas into actual structures and artifacts. The EU SPIN document mentioned earlier unwittingly illustrates this approach: “Innovation (...) needs (...) a visionary that has the idea; an entrepreneur that organises to put the idea into practice; a salesman to commercialise the idea; a financier to finance the product development; customers that demand new and innovative solutions” (Klingspor & Fortkamp, 2010). This is a huge misunderstanding of how such processes work. From idea to implementation it is simply “execution”: a “vision” needs to be “put into practice” by an entrepreneur, financed, and commercialized, leaving little to no space for any design activities and human-centered reassessments.

Additionally, the use of traditional bottom-up co-creation processes can result pragmatically problematic. Both the steering group and the DKC group insisted on an inclusive, bottom-up co-design process built on a multi-actor perspective. This was partially sidestepped by companies whose decision makers mainly brought themselves into the process and personally attended the two workshops with the aim of bringing management seniority to the conversation. Especially in December, many attendees were “koncernchef”, high-level managers with a strategic view, rather than an operative view, of the problem space. This not only
led to some last-minute retooling of the activities, but it conceptually turned a bottom-up conversation (DKC-side) into a top-down conversation (SME-side) (fig. 7).

Figure 7 Organizational view shows SME executives introducing an additional top-down loop in the process

This appears to be yet another loop reintroducing the same problem the authors experienced first-hand in the framing of the DKC itself, with the initial top-down process initiating the project assuming pure “execution” and remaining completely unaware of and disconnected from the complexity and uncertainties of design for large-scale socio-technical change.

References


