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STANDARDIZATION IN WORKSHOP DEVELOPMENT:

An SAP d-shop case study

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Abstract

In the technology sector, it is crucial to foster and maintain a workforce which is up-to-date with the latest advancements in this fast-paced industry. Companies of SAP's magnitude have also the large size and employee diversity as added factors in this equation. In order to keep employees updated, there are a series of measures taken by SAP to ensure their access to quality information, be it internally or externally sourced. Among these, there is the d-shop. It differs from other enablement initiatives and products in SAP by its practice-centered approach and bottom-up operation, in many ways inspired by the maker movement. The approachable, decentralized management and operation of d-shop, while being one of its main highlights, is also at times one of its weaknesses. The initiative's openness to collaborative content creation results in a diverse pool of authors, and, consequently, a big variance in type of content and presentation style. It is indeed a two-sided coin, representing both the embodiment of what a grassroots initiative stands for (free, malleable and adaptable), but also a logistics challenge in efficient content transfer and consistent user experience terms.

Addressing these two conflicting issues, a framework for content structuring and delivery will be proposed in this project, while honoring the grassroots ideals of inclusiveness which are the cornerstone of d-shop initiative. Sterling Software Inc, an SAP partner, describes their solutions implementation in a way which perfectly describes the opposing forces dealt with in this project:

“Through a balanced focus on both standardization and flexibility, we deliver business process expertise and best practice guidance...”
(Sterling Software Inc, 2017).

This proposal's purpose is, therefore, not restricting the d-shop's liberty in developing and delivering workshops, but rather facilitating the transferring of information and promotion of a consistent branding/presentation tone for d-shop's content. This would also result in the maintenance of quality consistency in user

experiences and expectations when engaging the initiative.

Due to the great level of autonomy each d-shop location enjoys, the outcomes of this project will be considered guidelines of voluntary implementation, rather than top-down enforced measures. This malleability is seen as beneficial, as there is no way to foresee all the needs and possible applications of this project's outcomes in the future, especially in a global context. The possibility to tweak and update the project's outcomes as time goes by only aggregates value to them, serving as a foundation to build upon rather than a punctual and short-lived intervention.

Keywords: *Service Design; standardization; horizontal knowledge transfer; grassroots; bottom-up; technology workshops.*

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1. Introduction

"SAP is the world leader in enterprise applications in terms of software and software-related service revenue. Based on market capitalization, we are the world's third largest independent software manufacturer"

(SAP [1], 2017).

SAP was founded by 5 former IBM employees in 1972, who left that company to follow the future vision of "real-time" computing, standardizing and automating business processes. SAP employs approximately 82,400 people in more than 130 different countries (SAP [2], 2017).

In its corporate culture, SAP incorporates Design Thinking principles, as it sees the potential of user-centered-focused software development (Design at Business, 2016). Sam Yen, Chief Design Officer at SAP, recognizes that "Design-led organizations have far exceeded value from other companies" (Yen, 2016).

The intertwining of technical expertise with other areas of knowledge, accelerated by Design Thinking, leads to an ever-increasing understanding of how this symbiosis can promote innovation. It promotes a culture of horizontal knowledge exchange, as SAP focuses on "building bridges, not silos" (McDermott, 2016).

Two things are meant by "horizontal knowledge exchange" in this project: the peer-to-peer sharing of information, dissolving vertical hierarchical levels, and the prioritization of exploration and general understanding of technological concepts over specialization (a concept popularized by Brown [2010] as the "T" shape, where the horizontal stroke symbolizes breadth of knowledge, and the vertical one symbolizes its depth).

The approach taken by SAP in connecting different areas of expertise within the company sets the stage for the flourishing of enablement initiatives, which cater to a wide range of employees. Amongst those, is the d-shop, a bottom-up and inclusive initiative.

"The d-shop is an internal SAP program, with the aim of bringing new external technologies closer to all its employees. There are currently 23 d-shop locations worldwide, in the major

locations where SAP employees can be found. In a d-shop space, SAP employees can experience technology first hand, talk with experts and receive training on how to get started using these new technologies within their own software creations. The technologies covered include Internet of Things (IoT), Virtual and Augmented Reality, 3D Printing, Robotics, Machine Learning and more”

(Vayssière¹, 2016).

The name “d-shop” is short for “the developer’s workshop” (Vayssière, 2016). It is seen by SAP as a way to keep employees up-to-date, inspired and motivated, while the company pushes forward as a leader in software development. It is a grassroots initiative, which means it has collaboration and inclusion as core values, and the operation focus is defined by user’s demands, rather than by the supply of available knowledge (Lang, 2013, pp.12). Everyone is welcome at the d-shop, and also in contributing to its growth. The d-shop occupies a unique niche among other learning products and initiatives at SAP, in promoting awareness and hands-on learning of new external technologies, while bridging these to SAP’s context. It can therefore, under the categorizations of “outside-in” and “inside-out” innovation proposed by Chesbrough (Chesbrough apud Osterwalder; Pigneur, 2010, pp.110), be considered an “outside-in” innovation initiative, stressing the importance in being up-to-date with external technological developments, rather than being closed-up inside the company. “Learning and as a result educated and trained people that are on top of the latest innovation and technology are key to SAP’s success” (SAP [3], 2017).

Being a flexible initiative inside SAP, any office location may open its own d-shop (pending on local management approval and volunteer availability, as only central d-shop locations² are permanently staffed). “The central d-shop team provides best practices, guidelines, budget and connects the various d-shop locations together” (Vayssière, 2015). The d-shop is a versatile space, which offers users a variety of different possibilities for interaction, which range from more active-focused participation to more passive-focused engagement (image 1).

Throughout its operation, the main d-shop value offers were pinpointed by

¹ Responsible for the d-shop program globally in SAP.

² Walldorf, Germany and Palo Alto, USA, as of 2018.

Vayssière (2017) as being the following (clustered under level of activity in engagement):

Participatory Engagement

- Internal learning space

Workshops aimed at introducing users to external technologies, contextualizing these to SAP and eventually going deeper in certain topics, with different levels of content difficulty.

- Internal workspace

The d-shop has tools and materials which are sometimes difficult to access as an individual, and they can be freely used by employees to experiment, create and collaborate on projects.

Spectator Engagement

- Internal demo space

The d-shop is open for any employee to see, test, and discuss the available technologies and hardware.

- External showroom

The d-shop is an interesting location to bring externals to. It shows that SAP is open to fostering innovation and is attentive to upcoming technologies and their effects on its businesses.

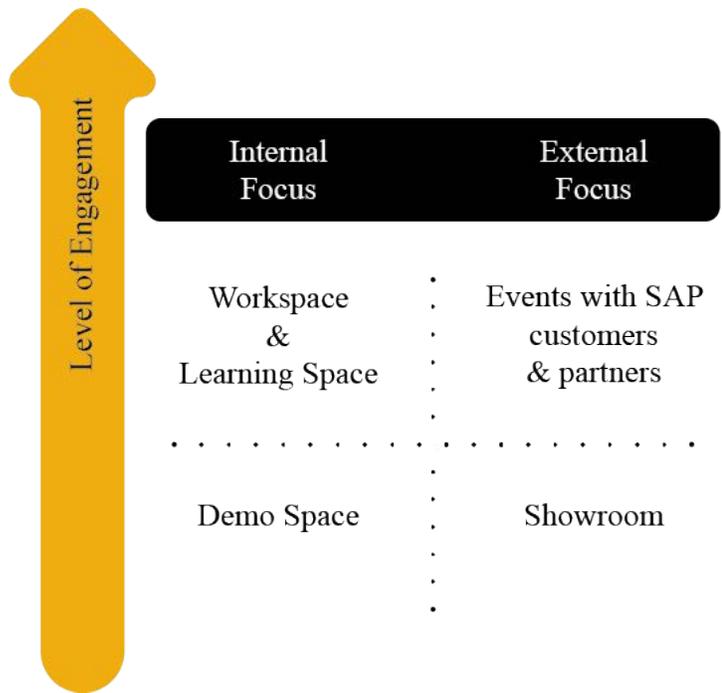


Image 1. Different levels of activity in engagement with d-shop, on its different offerings. Source: The author

1.1 Research Question

The d-shop is an already well-established initiative inside SAP, which is testament to its value in the company. Despite displaying consistent growth in terms of locations, there seems to be limited growth in each location individually, with the d-shop remaining somewhat in the margin of the mainstream talks in the company (Expert interviews, 2017).

Setting out with the broad scope of improving overall experience in the d-shop (for both collaborators and users as well), it was soon realized that, being an in-company initiative, there were some aspects of its operation which fell under SAP's rule, and thus beyond the reach of this project. Any solutions proposed by this project should be easy to implement. Involving aspects which would require external permission to be implemented would reduce the practical value of the proposed outcome. For this reason, the initiative's operation processes took center-stage as the main object of research.

Being successfully operational for many years, the d-shop already counts with

all the touchpoints necessary for enabling knowledge transfer between employees in technological topics. What is missing in the d-shop is a well-established structure connecting those touchpoints amongst themselves, and further developing them. Successfully developing this structure would lead to a more concise and fluid user experience, rather than a collection of disconnected interactions, while further facilitating its main purpose of boosting technological knowledge at SAP. Within the scope of existing touchpoints between the d-shop and its audience, content and delivery were chosen as the main points of action for this project. This led to the project's research question:

Can horizontal knowledge transfer be facilitated in the context of d-shop, through workshop content/presentation standardization?

2. Data and Methods

2.1 Data collection methods

“... designing mainstream qualitative research [...] entails immersion in the everyday life of the setting chosen for study, that values participants’ perspectives on their worlds and seeks to discover those perspectives, that views inquiry as an interactive process between the researcher and the participants, and that is primarily descriptive and relies on people’s words as the primary data”

(Marshall; Rossman, 1989).

User-centric design approaches demand empathy from the designer, and a profound understanding of user’s needs, which can only be achieved by reaching out to them. This has invariably led to the need to use a qualitative approach in this project. There was little in terms of existing research and figures representing d-shop’s performance, and a quantitative overview of the initiative’s impact inside SAP remains an elusive proposal, as the d-shop global lead admits to the intangibility and immeasurability of d-shop’s real value offerings (Vayssière, 2018).

Marshall and Rossman (1989) recognize the challenges in conveying the reliability of qualitative research, especially in contexts that have for long been served by quantitative research approaches. SAP, a world leader in enterprise resource management software, understands and monetizes the power of big data, but also shows openness to other types of knowledge fronts. Most noticeably the Design Thinking rationale, which is strongly embedded in the corporate culture, being heavily advocated by SAP’s co-founder Hasso Plattner (thisisdesignthinking.net, 2015). In practice, areas that deal with experience and satisfaction can already be seen promoting the importance of qualitative user-centered approaches in understanding users/customers. A customer satisfaction and engagement representative at SAP explains that “Asking customers to tell their story is the first approach taken when trying to understand customer-related issues” (Expert interviews, 2017). Despite this perceived openness to qualitative methodologies, the same representative admits that translating services such as the d-shop to quantitative or monetary figures is the easiest way to convey the initiative’s value to higher management (Expert interviews, 2017).

Taking this context into consideration, it is important to reflect on the intrinsic values of qualitative approaches. “Substantive focus” is described by Marshall and Rossman (1989) as a means for argumentation in favor of qualitative research. It implies extrapolating the validity and relevance of a limited number of observations into a larger context, thus proving its significance. This qualitative approach to research falls, therefore, under the umbrella of inductive reasoning, in which logical theories are proposed from a subset of observable data (Utah State University, 2011). The data gathering methods characterize a descriptive/exploratory research type, in which “Data are gathered by participant or nonparticipant observation, as well as by open-ended or structured interview schedules or questionnaires” (Downs; Fawcett, 1986).

For better analyzing a problem and its underlying causes, there needs to be diverse fronts of data gathering, making for a stronger output, in a process called Triangulation (Miettinen, 2017). In this project, mainly four fronts were used for understanding d-shop’s context, current operation and possible future improvements: experts from diverse areas inside SAP (Expert interviews), the d-shop’s team (Brainstorming activity & Expert interviews), the users (User interviews), and own observations:

1. Seeking an understanding of SAP’s current operations regarding internal educational programs, internal experts from related areas were interviewed. While not being a part of the d-shop initiative, their work paints a picture of how some operations take place inside of SAP, and sheds light into potential opportunities/obstacles. This stage of research comprised mainly of unstructured discussions about the interviewees’ works.
2. With the purpose of better understanding the scope of the project, the d-shop’s staff was invited for a brainstorming session. The brainstorming methodology was reversed for swiftly uncovering issues with the d-shop (rather than being used for proposing solutions to a previously known problem). The uncovered issues were then categorized, interconnected through a causality analysis and prioritized.

3. Having a general idea of the problems faced by the d-shop initiative, users were gathered for a 2-section interview. They were conducted with 27 users from 8 different d-shop locations around the world, in an attempt to better understand their relationship with d-shop as a company-wide initiative (despite expressive differences in operation depending on country). The first section was a semi-structured survey. “Typically, surveys use structured instruments for data collection, although open-ended questions may be included in the instrument” (Downs; Fawcett, 1986). Despite having closed-ended questions for gathering general information on the poll of interviewees, the main focus was on open-ended narratives as a way of understanding users needs and wishes. This section aimed at identifying users’ motivations and expectations (present), as well as requirements and descriptions of ideal experiences (future) in the d-shop. The second section consisted of user-reported narratives of their experiences when interacting with the d-shop. These were guided only by a pre-established frame, which divided their user journeys in: pre-engagement, engagement and post-engagement. Users were asked to recall a workshop they had participated in as a starting point for narrating their experiences. While the structured section of the interviews focused on the “what’s and why’s”, the journeys made explicit the “how’s”.
4. Finally, in an attempt to empathize with the users, first-hand experience was gathered from participating in workshops. The aim at this stage was not documentation, but rather seeing the service through the “user’s lenses” in an attempt to better understand the scope of the project and better relate to the reported user experiences.

2.2 Research Methodology

Each of the research stages laid the ground for the following one, clarifying the focus of the project in each of these stages. “Brown (1977) characterized the

relationship between theory and research as a dialectic, a transaction whereby theory determines what data are to be collected and research findings provide challenges to accepted theories” (Downs; Fawcett, 1986, pp.4). The theory that guided and determined the focus of this research came from the study of available content regarding the d-shop initiative and interviews with both SAP experts and d-shop team members. The subsequent user interviews were then used as a template, upon which these early assumptions were tested against. It is important to understand, therefore, that despite this project’s proposed standardization solution being directly targeted at d-shop contributors (as they will be the ones to implement it when creating content), a large focus of the research process was set on better understanding users’ experiences, needs, desires and expectations. It should be stressed that, though the workshop standardization system is the outcome of this project, it is but an avenue towards the higher goal of facilitating horizontal knowledge transfer. Promoting content creation without adequately addressing its audience would otherwise be useless.

Considering that this study took SAP’s d-shop initiative as the research’s focal point, among a range of similar external initiatives, the case-study research methodology was used. Falling under the categorization of empirical descriptive research (Downs; Fawcett, 1986), “Case studies are intensive and systematic investigations of many factors for a small number of individuals, a group, or a community” (Downs; Fawcett, 1986, pp.5)”

This methodology relies heavily on qualitative data, whose value was already presented. As discussed before, though, due to the type of work performed at SAP relying heavily on the tangibility and measurability of data, it may be the case that the value of such methodology is not immediately perceived by the community. Flyvbjerg (2006) identifies 5 main misconceptions when dealing with case-study research:

“(1) Theoretical knowledge is more valuable than practical knowledge; (2) One cannot generalize from a single case, therefore the single case study cannot contribute to scientific development; (3) The case study is most useful for generating hypotheses, while other methods are more suitable for hypotheses testing and theory building; (4) The case study contains a bias toward verification; and (5) It is often difficult to summarize specific case studies” (Flyvbjerg, 2006, pp.1).

Defending the value of using qualitative data and case-studies in research, Flyvbjerg (2006) counters each of these preconceptions:

1. All knowledge regarding humans is contextual, so it is not possible to adequately analyze human interaction through universal theories.
2. Case studies may be central to scientific development through generalizations, given that sampling is done strategically in order to prove a point.
3. The usefulness of case studies after generating hypotheses exists, but depends directly on the generalizability of the case. This, in turn, requires understanding of the issue and strategic case-selection.
4. It is not uncommon that in-depth case studies actually prove to challenge researcher's preconceptions and biases, forcing them to reevaluate their original hypotheses.
5. Sometimes the properties of the studied reality difficult summarizing, rather than the methodology itself. Summarization is, though, not always desirable, as case studies may be read as narratives.

Downs and Fawcett (1986) argue that descriptive research techniques (including use-case research) are used for understanding the basic characteristics of a phenomenon, while the development of theories addressing relationships between the observed phenomena belongs to the realm of correlational research (Downs; Fawcett, 1986). As established before, case studies might, indeed, be used for better understanding and even inferring potential results in similar external contexts. This can be done with the aid of deductive reasoning, in which the results obtained in a single sample of the total population are extrapolated as relevant and valid to other representatives of this population. This project's ambition, further than improving horizontal knowledge transfer in the d-shop through standardization, is that the theoretical outcomes achieved may be benchmarked, adapted, and adopted by similar grassroots initiatives in other companies.

In summary, the research methodologies and concepts used to formulate the

research plan can be seen as a series of steps, starting from the research question: “Can horizontal knowledge transfer be facilitated in the context of d-shop, through workshop content/presentation standardization?”. This question proposes a hypothesis, that standardization has the potential of facilitating horizontal knowledge transfer. This hypothesis was then applied to a case study, in which the d-shop was the test subject. Understanding how the hypothesis interacted with the d-shop’s reality, a solution system was proposed for the implementation of the hypothesis’ concepts, aiming at achieving the proposed goal. The solution system, following review from the d-shop collaborators, could then be extrapolated as having similar impact in parallel scenarios (externally from the single case study) via deductive reasoning. A visualization of the research plan can be seen in image 2:

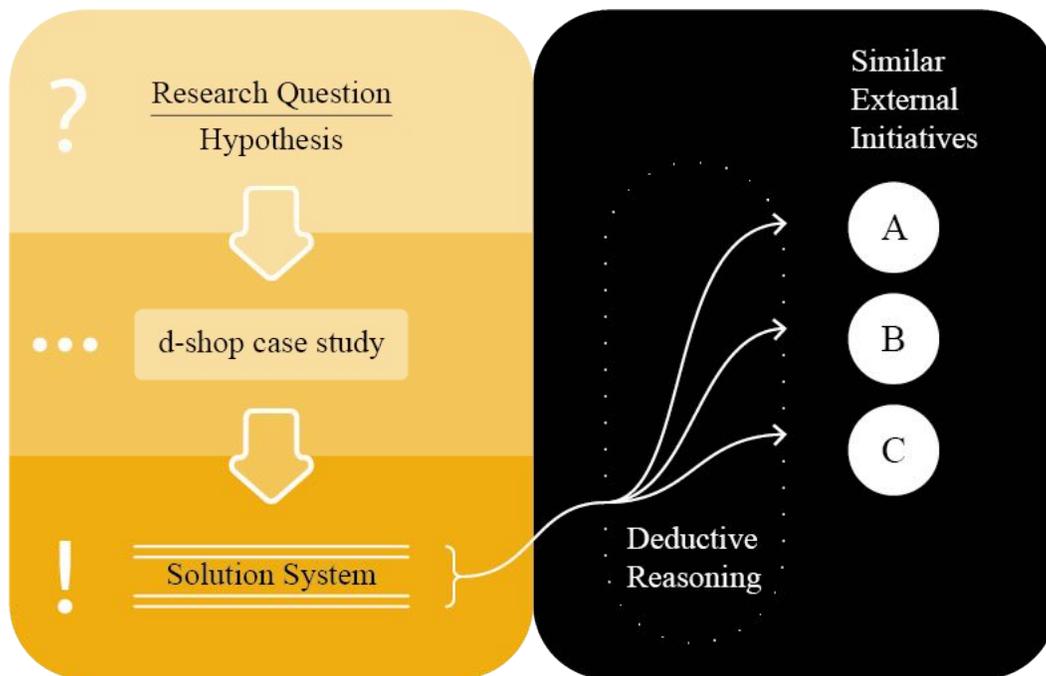


Image 2. Visualization of the research plan. Source: The author

3. Literature Review

In dealing with facilitating workshop content creation, it was crucial for this project to better understand the mental processes of knowledge acquisition and concepts surrounding learning. Troncon (Stickdorn; Schneider 2011) explains the field of service design as being a departure from focusing solely on the outcome of the design process, to rather perceiving the context in which any design outcome is immersed. Similarly, Kolb (1984, apud Bennet; Bennet 2008) theorizes knowledge as a process, not a product.

During this project, the theory in the workshop's content will not be addressed, but rather the necessary steps in structuring and compiling this content into artifacts (manuals and other guides) for user consumption. Alex and David Bennet (2008) affirm that only information may be shared between people, regardless of media, as knowledge implies individual reasoning and understanding. A parallel can be made with de Bono's (1996) distinction between value and benefit, with value residing in the "thing", and benefit being an intangible and variable construct originating from such "thing". While this project aims at increasing employees' knowledge, resulting in personal benefit, it can only do so by improving the methods of conveying information and value. In other words, the formatting of disclosed information and its available formats will be the main focal points, guided by a comprehensive analysis of users' experiences throughout their journey with the d-shop.

To better understand knowledge, how it is formed and what kinds of knowledge will be focused upon throughout this project, the following categorization by Alex and David Bennet (2008, pp.408-409) will be used. It subdivides knowledge into three distinct levels: surface, shallow and deep:

- Surface knowledge accounts mostly for information, which requires little understanding and whose existence is, according to Souza (2006, apud Bennet; Bennet 2008), rather volatile as it has few connections to other memories.
- The level of shallow knowledge adds understanding to the equation. Understanding opens up a new dimension to knowing, as an introspective

activity of sense making, establishing connections between existing knowledge and new information in order to create new knowledge.

- Deep knowledge is the integration of understanding, meaning and practice. It can be almost unconsciously recalled in form of experience, intuition and insight. It requires effortful practice and time to be acquired, as it relies on pattern-detection.

Adopting the three distinct levels of knowledge proposed by Alex and David Bennet (2008) as a framework for analyzing the operation fields of d-shop, it can be said that concerning its use as an internal learning space (including the development and consumption of workshop materials), the d-shop almost exclusively fosters shallow knowledge. Though there are deviations in this spectrum, the surface knowledge area is the only one for which there doesn't seem to be a corresponding offer by the d-shop. People who reach out to the d-shop don't want to simply be provided facts about a given technology - which would be easily achieved by performing a quick online search (surface knowledge); they do so because they are curious to understand (shallow knowledge) what any given technology is, and its effects on their personal and professional lives. Those who approach the d-shop as a path for reaching a more distant and complex goal, are ultimately seeking deep knowledge (through effortful practice). The way in which the d-shop supports these people is more individual, through its use as an internal workspace, and on a case-to-case basis. Many of the users who seek deep knowledge are even "recruited" by the d-shop in assisting others, as part of an ever-growing community, honoring the initiative's "bottom-up" approach to learning.

With the depth of knowledge already established for this project, the categorization of this knowledge could also be scrutinized through the lenses of Alex and David Bennet (2008). The two most critical knowledge categories to d-shop's operation as an internal learning space are (the prefix "K" is used here as a substitute for the word "knowledge"): "Kresearch, includes theoretical as well as empirical knowledge and represents the fundamental concepts that explain why things happen..." (Bennet; Bennet 2008, pp.410) and Klearning, which "...includes individual, group and organizational learning. This focus is to ensure that as a situation or process unfolds,

individuals learn from each other...” (Bennet; Bennet 2008, pp.411).

Kresearch is the type of knowledge which the content creator has gathered through research and practical experience, and which needs to be translated into content for the d-shop’s users consumption. “Klearning”, on the other hand, happens during workshops through peer-to-peer interaction, most notably during practical exercises. It can be further incentivized by the division of workshop attendees in small groups, for solving the proposed tasks.

A correct understanding of knowledge and its categorizations was crucial to also research how it could be structured and standardized, with the purpose of facilitating its management, be it in the process of creation, storage or consumption. Opinions regarding standardization vary at SAP, depending on the point of view and subject of discussion. Generic discussions on the value of standardization inside the company can be seen as counterproductive, as “...the simple 'freedom vs. order' metaphor distorts perceptions of reality by recasting a problem that is essentially dynamic into a static choice framework” (David; Rothwell, 1996, pp.188). This dichotomy could be rather seen as an opportunity at introducing a dynamic degree of diversity/standardization (David; Rothwell, 1996), being that “...the fundamental issue with which all social organizations are confronted [is]: where to position themselves on the terrain between the poles of 'order' and 'freedom'” (David; Rothwell, 1996, pp.185).

Standardization has become common-practice in organizations from the industrial era forward (David; Rothwell, 1996), being considered as a positive development in guaranteeing consistent levels of quality. While this may work intuitively in that case, there is a big pushback in standardization by less-technical areas, with “...uniformity [...] charged also with stifling creativity...” (David; Rothwell, 1996, pp.186) and with narrowing and delimiting the possible area of observation (David; Rothwell, 1996).

Standardization is useful in creating a foundation of knowledge, which is d-shop workshops’ main premise. While it delimits specific areas of importance (as any other structured learning course would), this is done “...to focus experimentation in useful directions...” (David; Rothwell, 1996, pp.186). d-shop workshops still incite users to look outside its constraints, through exercises, direct contact with experts, and the

possibility of continuous individual learning by having access to d-shop as a workspace.

For proposing standardization of knowledge in artifacts (i.e. content) used in workshops, it was necessary to understand its implications in the learning process. A few tools coming from the area of management, such as Total Quality Management³ (TQM) and Six Sigma⁴ have standardization as a core element in quality assurance (Meuter et al, 2009). Though mostly related to quality in the development and manufacture of products, Meuter (2009) explains how these concepts have “...also produced positive results in the service sector, including some applications in higher education” (Bandyopadhyay & Lichtman, 2007; Lawrence & McCollough, 2004; apud Meuter et al, 2009 pp.109). Meuter (2009) has, in his article, focused on the beneficial use of standardization in university courses; therefore his findings are of extreme relevance in the analogous scenario of learning workshops in the d-shop. The proposal of standardization in an academic context means that a diverse group of teachers will be presenting what is at essence a single content portfolio. This can be seen as a similar situation which will happen when standardizing d-shop content: though not mandatorily enforced, it would be desirable that different d-shops reuse existing content in order to streamline their operation (Vayssière, 2017). As the d-shop is a grassroots initiative, which therefore does not strictly enforces guidelines, any standards proposed would fall under David and Greenstein’s (1990, apud David; Rothwell, 1996) classification of voluntary standards, which are taken more as loose guidelines. It is necessary to take this approach to maintain harmony between the d-shop locations. The standards created shall be promoted as best practices, of voluntarily application.

Discussing implementation, Meuter’s study (2006) mentions the creation of periodical faculty meetings in order to discuss the material’s conception and performance (Meuter et al, 2009). Geographical distances between d-shop locations would make it nearly impossible to replicate this approach, though. This way, a solid framework created from the combination of users, experts and d-shop’s inputs could minimize conflicts in content creation, as the proposed solution will have been

³ “the involvement of all of a company's managers and employees in making sure that its products and services are all of a high standard and exactly as designed” (Cambridge Dictionary, 2018).

⁴ “a method for improving production processes so that the quality of products is nearly always perfect” (Cambridge Dictionary, 2018).

developed in accordance to the stakeholders' needs. As has happened in Meuter's study (2009), it is also expected that, with time, the unified implementation of the workshop content creation system will facilitate voluntary discussion of the evolving workshop content, aiming for continuous improvement (Meuter et al, 2009).

4. Development

4.1 Who are the d-shop users?

Being that the proposed workshop standardization framework has to address the needs and expectations of d-shop users, great focus was given in understanding who they are. The majority of d-shop's audience comes from software development-related areas, being only about one third of its users from other professional backgrounds (design, sales, marketing, etc.).

Almost half of all users have discovered the d-shop through recommendations from colleagues. The initiative takes advantage of its impressive net-promoter score as its main marketing avenue, as 9 out of 10 users report having suggested the d-shop to other colleagues after engagement. This allows the d-shop to save on its limited resources (in addition to monetary, most notably labor resources, as many d-shop locations rely on employees' volunteer work to maintain themselves). The other half of users, which haven't discovered d-shop through word-of-mouth, discovered it either by coincidence (e.g. by passing in front of the d-shop) or through the initiative's active marketing efforts. It is important to mention that the d-shop's physical location is not always prominent inside an SAP lab. This severely limits the possibility of coincidental discovery in some locations.

About 55% of the users report engaging the d-shop a few times a year, while the remaining 45% engages the initiative at a monthly or even weekly basis (single-time attendees were not interviewed to avoid isolated and potentially biased experiences). Here can already be seen an indication of the divide between users who seek shallow knowledge and the ones who seek deep knowledge. The amount of d-shop's workshop content offerings is not yet so comprehensive as to be able to cover long-term weekly or even monthly engagement with new content every time. Users who engage this much with the d-shop (be it participating in workshops, using the facilities, troubleshooting with its experts, etc.) are entering the realm of deep knowledge, and seeking more than a shallow understanding of a topic. Users who interact with the d-shop few times a year are much more likely to be interested in different subjects at a shallow level.

In terms of motivation, d-shop's users are predominantly driven by either a more generalist curiosity of new technologies, or by the desire to learn about a specific topic. While the number of users seeking the d-shop due to an existing work-related need is comparatively not as high as the purposes mentioned before, many of those who attended out of curiosity have reported finding a professional use for either the practical or theoretical knowledge acquired from the initiative.

Users' interest is mostly reinforced by expectations of personal improvement and personal application of acquired knowledge (77% of all mentioned motivating factors fell under these categories). The remaining subset of outcome expectations reflects a desire in understanding and applying the learning in a professional context, or even in learning to teach others (usually externally then, e.g. students of less privileged communities, family, etc.). Using Frederick Herzberg's distinction of motivation types, it can be said most users' motivation to engage the d-shop is intrinsic, while few have extrinsic motivating factors dominating the equation (Herzberg apud Hofstede; Minkov, 2010).

4.2 Problem definition

4.2.1 d-shop's unique offerings

A necessary reflection on the problem definition is understanding d-shop's unique offerings. There are plenty opportunities for technology learning, which can be easily found and consumed over the internet, cover a wide range of topics and skill levels, and are available at a variety of prices and quality levels. These have content which proceeds from a variety of sources, from big organizations to individuals. Usually the main determiner of the content's perceived quality is either its source (reputation) or user reviews. The d-shop does not stand out simply by having free and quality content, as there are many reputable organizations (academic, e.g. Harvard⁵, Stanford⁶, and private alike, e.g. Autodesk⁷, Microsoft⁸) offering free

⁵ <https://www.edx.org/school/harvardx>

⁶ <https://lagunita.stanford.edu/>

classes/workshops. When standing against potential competitors, the d-shop relies on three main pillars to support its unique value proposition: context, convenience, and network.

On the context side of the equation, the initiative is a part of SAP, and therefore has the unique opportunity to contextualize whichever technology it presents under the light of its relationship and relevance to the company. These parallels provide a unique perspective and added value, which can't be found elsewhere.

Convenience-wise, users don't have to do any extensive search for content, as the d-shop offers a clear and curated selection of content. It also offers direct contact to an in-house network, which users can benefit and get support from. The diversity of external online offers may be daunting to some users, especially those who are not very familiar with the technologies they wish to learn (this may even lead to the concept of "paradox of choice", proposed by Schwartz [2005], in which the vast amount of choices is so overwhelming that it leads to no decision at all). In creating a limited portfolio of offers, there is the reduction of uncertainty users might face in engaging (David; Rothwell, 1996). If they can't clearly locate an entry point, this can easily become a roadblock in their exploration and interest in whichever technology. Finally, users from SAP locations equipped with physical d-shops have the added convenience of being able to take part in workshops that are offered in their own workplace.

When engaging the d-shop, users engage a community of experts, enthusiasts, and, at the very least, curious people. By doing so, they are able to directly access this network for support, feedback, discussion, etc. While this is also possible in other technology learning platforms, in the d-shop it is possible to do that at a much more personal level. Being that users and d-shop volunteers/staff are all part of the same company, networking is greatly facilitated.

Another aspect, which will not be explored in this project but bears mention as part of the unique offerings d-shop has when comparing to competitors, is the possibility for users to have first-hand contact with technology and devices/hardware, being able to test them and see them in action.

⁷ <https://academy.autodesk.com>

⁸ <https://mva.microsoft.com/>

One of the main shortcomings of d-shop, which was in a sense surprising to the d-shop leadership (Vayssière, 2017), was the fact that its lowest performing area of action is as an internal workspace. Looking back at years of d-shop existence, one of the d-shop initiative precursors (2017) identifies corporate culture as a big responsible for the notable differences when comparing d-shop at SAP to other makerspaces in different companies. He sees SAP as being a more “family oriented” company, employing many people who have their family circles and come to work mainly in a 9-to-5 basis, while other tech giants might be more focused on younger single employees, who are catered to with many extras to their work experience, such as restaurants, barber shops and other facilities which motivate them to spend longer periods of time in the company. In these scenarios, makerspaces are more vastly used as internal workspaces, thriving as an additional benefit in employee retention. That isn’t perfectly translatable to SAP, as employees don’t have the same needs and desires.

This d-shop precursor’s view was supported by many users who admitted not wanting to spend too much extra time in the company or simply “not having enough time”, which was the leading reason given for not engaging further with the d-shop (User interviews, 2017).

4.2.2 User experience journey overview

Knowing what makes d-shop “stand out from the crowd”, it was possible to move forward in understanding where it doesn’t perform optimally, and what could be done to elevate the initiative’s overall performance in facilitating learning.

After having some contextual introduction to the strengths and shortcomings of the d-shop initiative, when interviewing some of its team members, the d-shop’s performance was analyzed from the user’s perspective. For that, the unstructured section of the user interviews was used. As in the interviews, the same division in pre-engagement, engagement, and post-engagement was employed when categorizing user’s feedback. What was discovered when analyzing their reported journeys in the d-shop was consistent with d-shop team’s perceptions: the pre and post-engagement areas were the lowest performing ones in terms of user experience, both scoring negatively, as

seen in image 3:

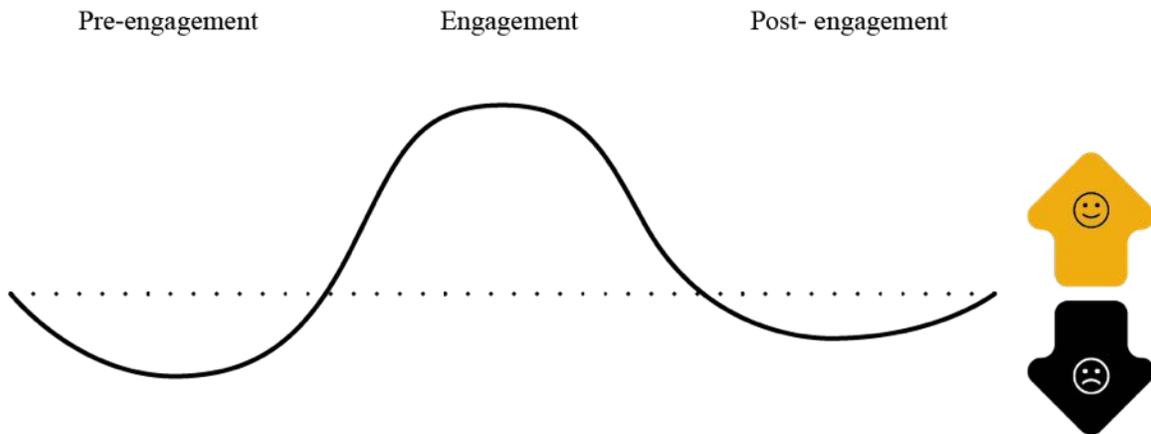


Image 3. Average experience throughout the d-shop user journeys. Source: The author

Being based in reported user experiences, the performance measurements were directly translated from the numerical value averaged from positive and negative mentions, in each of the discussed areas. The fact that both pre and post-engagement areas scored negatively means that, during unstructured user interviews, reported pain-points in those areas have numerically exceeded reported positive aspects in the same areas. The engagement section was the only one with a positive value average.

4.2.3 Action area within the user journey

Taking users' narrated experiences as the only input, logic would call for interventions in the two lowest performing areas of the service journey. There are, though, a series of external factors at play, that go beyond the scope of this project, at either side of the engagement section. While d-shop is a flexible and agile initiative, it is still inside SAP, which is less agile due to the restrictions all companies of this size and international relevance have. Obstacles which fall out of reach from the intervention power of this project (mostly in either of these two low-performing areas) may come from both tangible constraints (e.g. space and budget) as well as intangible ones (e.g. local regulations and available platforms). Let's explore a few of these external constraints and the possible negative side effects of focusing transformation efforts in

each of these areas separately, without considering the d-shop system holistically:

Pre-engagement consists mainly of two steps: marketing and registration. An industry strategy and portfolio manager (2017) commented that, without a sturdy infrastructure, expanding the initiative's reach could backfire, especially in smaller d-shops locations that are not full-time staffed (Expert interviews, 2017). The main concern here, shared by the global d-shop lead (Vayssière, 2017), is that focusing on marketing could lead to an unbalanced demand/capacity ratio. This could easily harm the d-shop and its reputation, in such case where users wouldn't receive high quality service. This leads to a paradoxical situation in which the success of d-shop could actually harm it. Although growth is desirable, it should not be done at the expense of user experience and, subsequently, the d-shop's reputation; it has to be done in a sustainable way. Registration, the second major pain-point in the user journey, is heavily dependent of the Jam⁹ environment. Most users admit to disliking the platform, which also lies outside the scope of the project, being an SAP product/platform.

Communication with users (both prior as well as after the engagement section) and the lack of a structured approach to feedback gathering, were considered by $\frac{2}{3}$ of the d-shop's staff (Brainstorming Session, 2017) as being the most problematic area in the initiative. A d-shop lead (2016) has argued that most people are unwilling to offer feedback in a structured form (Expert interviews, 2017). It can be seen as true, by the aversion many users have shown in providing feedback, that many of them would not usually be willing to do so. It was noticed, though, that when asked to choose their preferred feedback method, 6 out of 10 users preferred structured approaches (e.g. questionnaire, forms), as opposed to unstructured ones (e.g. conversational, writing). This preference was mostly due to convenience and speed (many users mentioned speed and a limited number of questions as crucial factors weighing their decision to respond to a questionnaire or not). This insight may shift the problem's perspective from the type of feedback form to the way it is presented and its content. Adding to the general aversion some users demonstrated in providing feedback, is the fact that there is no clear strategy on its use by the d-shop. One obstacle to that might be the heavy

⁹ An internal SAP collaboration tool, which operates somewhat similarly to social media platforms. The d-shop has its own page in this platform, where material and information are freely shared.

restriction in evaluating peer performance in, for example, Germany. As workshops are given by volunteer colleagues, questions about the workshop experience would be limited, when having to exclude all human-sensitive subjects from the feedback questionnaire.

Having discussed the shortcomings and challenges in focusing on pre and post-engagement in this project, it can be seen that focusing on the best-performing area of engagement, in terms of user experience, has its reasons. Regardless of the research question and focus being in the engagement area, more precisely in the workshops, it doesn't mean that there won't be secondary benefits to the pre and post-engagement areas, improving overall user experience.

4.2.4 Secondary benefits in pre and post-engagement

As the focal point of this project is workshop standardization, its “action stage” is set in the engagement area, considering that this is where the solutions will directly affect and interface with the users. Despite that, it is important to consider the service provided by the d-shop as it is a series of interconnected experiences. This is necessary in understanding how improvement proposals in the already well-performing engagement area might influence the other two areas of user experience.

It is a safe assumption that quality of content and user participation in workshops are positively related concepts. Working on structuring content and its delivery, users will have a consistent experience every time they engage the d-shop, and thus well-formed expectations regarding content format, delivery style and quality prior to recurring engagement.

On the other end of the journey, assessing user experience after workshops requires a measurable framework for evaluation, which would hardly work in d-shop's current situation. The current content portfolio is absolutely heterogeneous in the way content is compiled (various media) and presented (different authors have different ideas of what is relevant in a workshop). This prevents a widely applicable post-engagement assessment. Continuous improvement requires some sort of reliable and quantifiable progress measurement, therefore trying to achieve it without a solid and

consistent structure would be pointless (Expert interviews, 2017).

Investing in the development of post-engagement user experience assessment strategies could generate valuable data on, for example, users' expectations and wishes. This could then feed back into the engagement area in the form of content and delivery improvements. In addition to feedback and assessment, post-engagement interaction could also help maintain d-shop's relationship to its users. It is crucial for the d-shop to foster its high net promoter audience of 9 out of 10 users, as they are currently responsible for nearly 50% of the initiative's new coming users.

The best way observed for promoting sustainable growth at the d-shop is by having top-of-the-class content delivery during engagement. Quality content has the potential to increase recurrence of users at the d-shop, as well as steadily increasing awareness of the initiative and increasing its number of prospect users in a progressive and controlled manner.

4.2.5 Which issues were focused upon

The rationale behind investing efforts in improving the already best performing aspect of d-shop's operation has already been discussed. The structured user interview section also supports that the majority of users' general motivations, expectations and wishes revolve around the d-shop's role in delivering theoretical/practical content. Only the issues framed in the engagement area were directly focused upon in this project. Any issues which were external to the engagement area were only considered when related to the project's general aim of horizontal knowledge transfer facilitation.

Facilitating horizontal knowledge transfer through workshop content standardization affects two different sides: the one which is sharing the knowledge and the one which is consuming the content. Each of the two sides has complementary issues, most notably:

- From the content creator's perspective:

The high amount of effort in compiling content into a workshop is a big obstacle

in convincing knowledge holders to document it (Vayssière, 2017). As content creation is something done “on-top” of regular work responsibilities, having d-shop’s support in this aspect is a big incentive (Expert interviews, 2017). An SAP development executive (2018) makes the case that SAP is not lacking in innovation, but rather in standardization efforts. There are opposing views to that statement in SAP, with some areas creating a polarity between standardization and innovation (Design at Business Community, 2016). As will be explained further in this project, standardization in this scenario will help in leveraging employee knowledge (thus facilitating innovation). There is immense potential in the untapped knowledge already inside SAP, which may just need facilitation efforts to be explored, and standardization can play a key facilitator role in this equation (Vayssière, 2017). This leads to a mixed-innovation scenario, in which d-shop aggregates knowledge from both internal as well as external sources (Chesbrough apud Osterwalder; Pigneur, 2010).

- From the content consumer’s perspective:

The disparity between reported workshop user journeys (User interviews, 2017) may indicate that either the different workshops taken by them are content-wise very disparate (regardless of the type of technology being taught, when considering type of content and its order), or some aspects of a workshop haven’t been covered in enough detail to be recalled by users afterwards. Due to the variance in type of information conveyed amongst different workshops, recurring users felt at times that some topics which were discussed in a workshop were missing in others. This also led to false expectations/assumptions regarding workshop content and delivery when users engaged the d-shop more than once.

These two main complementary issues were taken as a basis for the solution development. This solution would have to be implemented by the d-shop collaborator in order to affect the d-shop user. Its use directly impacts the d-shop collaborator, in facilitating content creation, while indirectly affecting the d-shop users through the promotion of consistency in workshops.

An opportunity for promoting sustainable growth both in community size as

well as in content availability and quality, originated from this shift in focus from addressing the consumption of content to its production. The d-shop is an ecosystem, which relies on collaborators and users alike to operate optimally. Negatively unbalancing this equation at any side would be unsustainable in the long run, but positively unbalancing it on either side would, on the other hand, provide a suitable environment of growth for the other.

Relying almost exclusively on a “peer-to-peer” model of learning, it was noticed that the d-shop currently lacks a well-structured framework for facilitating content sharing, from which benchmark and build upon in this project. The creation of such framework would arguably be amongst the first efforts of this kind at d-shop, at least in this level of detail.

Being a bottom-up initiative and taking cues from the maker movement (“Making is actually not about DIY, but rather all about DIT, or Do-It-Together” [Lang, 2013, pp.10]), the d-shop’s content is collaboratively build-up by its community. Vayssière (2017) assesses the availability of content as crucial to the creation of d-shops in other locations, where there isn’t a full-time d-shop staff available. This is due to the reduction of effort needed to get the initiative started in a new location. While content provided by the main d-shop locations may be used as-is, other locations are free to edit it to best suit local needs, languages, hardware availability, etc., or even create new documents altogether (Vayssière 2017). While “official” international documents are available in the main d-shop page in Jam, edited documents are posted in subpages relevant to their specific locations.

Without the constant refreshment of d-shop’s portfolio, following technology’s development and relevance, we can easily extrapolate a scenario in which the reduction of collaborators and new content would lead to the reduction of its users. The lack of a clear avenue to create content and efforts to facilitate this process doesn’t present an enticing platform for knowledge holders to create content at the moment. They would have to always “start from scratch” in doing so.

This can be changed with the proposal of a workshop content creation framework, which will provide future d-shop collaborators with a solution that assists them in the content development process, from start-to-end, as well as promotes

reflection on how the created content might be consumed.

4.3 Proposed solution:

Despite having developers and development-related users as its main audience, the d-shop does not only target these groups. The initiative prides itself in its openness, in receiving users from diverse areas with open arms. Despite its best intentions, d-shop's staff, which itself consists mainly of developers, is fully aware of its limitations in reaching different types of audiences inside SAP. If "Inclusion leads to innovation" (Dr. G. Pferdt, 2017), there are only benefits in widening the umbrella of d-shop's marketing strategy, to effectively reach a truly representative subset of SAP's diverse workforce, which has been considered one of the main issues the d-shop faces at the moment (Brainstorming exercise, 2017). This is where this project's solution has its most valuable outcome: in addition to facilitating the workshop creation process, it also promotes empathy and understanding from d-shop collaborators to its users. We will further analyze this aspect ahead.

The proposed framework will promote a unified style and tone to the workshops, while also addressing their sequencing, type of content and its depth. Its "recipe-like" formatting would make workshop creation much more straightforward, while promoting consistent user experience regardless of the topic dealt with. It is expected that, in addition to the leveling of a consistent quality of experience to all users, the standardization will improve learning outcomes, analogously to similar observations in the academic context: "...standardization appears to have a measurable positive impact on student learning" (Meuter et al, 2009 pp.118). This is an expected result, as outcome of the active consideration of which content is valued by the users in the development of the workshop. In this sense, a strong connection with the Design Thinking methodology of development from the final user perspective (Stickdorn; Schneider et al. 2011, pp.44), which has been fundamental in SAP's corporate success, can be identified.

This solution has to be flexible enough to be relevant for different technologies, locations, difficulty levels, etc. Ashby's (1964) "...law of requisite variety implies that

any decision you make must allow more flexibility in implementation than the variability of the situation you are influencing” (Ashby 1964, apud Bennet; Bennet 2008, pp.415). It is therefore important for a solution that aims to be long-lived to allow flexibility. The proposed solution is a three-step system, using three different tools:

1. Insight

Alongside general information about the d-shop initiative, practical content reframed from existing documents (compiled from d-shop’s Jam page content), and information on d-shop branding (adapted from SAP’s branding¹⁰), the prospect content creator will also find insights from the comprehensive study performed in this project. In addition to providing a better understanding of d-shop as a whole, they will better understand the d-shop’s users. This will, in turn, help shape the content developed.

2. Decision

Inspired by the “Business Model Canvas” tool (Osterwalder; Yves, 2010), this step consists of a few blocks of questioning, which are related to the creation of a workshop. Each of these blocks will have a non-exhaustive set of questions, which will prompt the content creator to explicitly consider how certain aspects of their initial workshop proposal (e.g. targeted audience, desired media, depth level of the content, etc.) would affect the type of content they develop. This step will be discussed in more detail in the “Decision-making tool” chapter.

3. Action

This step will be the actual development of the workshop. The prospect content creator will hopefully have already benefited from the two previous steps in considering how the proposed content can have the desired impact. The tools used to assist this step are fillable templates (see the templates in appendix 3 and 4), streamlining the content

¹⁰ www.sapbrandtools.com

creation process while maintaining homogeneity with the d-shop's content portfolio. It is important to once again stress how this homogeneity will not only be visual, but also in terms of type and order of content.

While the two first steps are more introspective, and fomenting the content creator's understanding of the contextual insertion of their workshop proposal, establishing parallels between their knowledge and user's needs/demands ("A Value Proposition creates value for a Customer Segment through a distinct mix of elements catering to that segment's needs" [Osterwalder; Yves, 2010, pp.23]), the third tool is the translation of the content creator's knowledge into the content itself, guided by the reflections taken earlier.

One of this project's main challenges will be providing guidelines that are specific enough that the resulting content can be immediately recognized as originating from the d-shop (creating a sense of branding to the initiative), while being flexible enough to afford the exceptional cases that don't perfectly fit this framework (which is only a matter of time in the fast-changing world of technology).

4.3.1 Booklet

As research progressed, it was clear that workshops were not the only type of content provided by the d-shop that did not follow a consistent structure. Information on best practices, creation and management of new d-shop locations, d-shop history, etc., also varied in presentation style, and were diluted in d-shop's Jam page. Despite not being the project's initial focus, this content strongly influences outsiders' perception of the d-shop, be them prospect users or collaborators. Compiling this information in the same document would then lead to a result in which the sum of all parts is more valuable than the individual parts by themselves. This led to the decision of implementing the practical results of this project in a booklet format (appendix 1), which would unite existing d-shop information with the outcomes of this project, as the final delivery. It will contain all the information needed to get started as either a d-shop collaborator or in creating a new d-shop, while not excluding the possibility to use this

booklet continuously as a reference manual, or even just to learn more about the d-shop.

The d-shop is a very flexible initiative. Despite having a global leading team, it does not dictate operations on other locations. What the central d-shop leading team can provide is the initiative's concept, operation guidance from over a decade's worth of experience, and guidelines. This project will not be, therefore, mandatorily installed in different locations. For this reason, to have a meaningful impact any content needs to be presented in a visual, fast and easy-to-consume manner. The voluntary adoption of these concepts worldwide means that the immediate perception of value is paramount to the success of this project, otherwise it risks being automatically dismissed (Vayssière, 2018). It shouldn't rely on extensive information about research or development to get its message across, as its purpose is not to present theory, but practical and actionable content in a concise format. The readers will be interested in application, not in theoretical conception.

To increase the likelihood of localized impact, it was decided to make this content available not only online (available to all through d-shop's Jam page), but also in print format for each d-shop location. Being strategically distributed, such material would have far more effect than a digital attachment in an email. The materiality of such object would hinder its automatic dismissal; such as it regularly happens with emails. SAP employees are dealing with immense amounts of information on a daily basis, and the large quantity of emails received makes users insensitive to new information and prone to quickly dismissing non-urgent messages without a second look (Vayssière, 2018).

The manual should help bridge design and soft skills to technical knowledge. By enabling the "left sided brains" (technical, analytical) who are providing content to better understand the nuances of service delivery and the power of empathizing with the service consumers, the users who are consuming this content (including the "right sided brains" [creative, intuitive]) will, as a result, have a facilitated access to their own technical learning capabilities. Content consumers which fall anywhere in the range of starters to experts will be able to reap the benefits of carefully designed workshops.

The d-shop booklet contains a variety of sections, which can be individually consumed according to the reader's needs. Despite having collaborators and d-shop

leads as the primary intended audience, d-shop users will also benefit from this solution, albeit in an indirect manner, as a result of the successful implementation of the booklet's precepts.

All chapters of the booklet are presented as questions that the readers might be asking themselves, promoting a more engaging, light and conversational tone to the material (in accordance to the proposed brand tone to be used by d-shop, presented in SAP's brand tone chapter). The chapters were presented as simply as possible, heavily relying on visuals to convey messages and thus improving the understanding of content, which is presented as a response for each chapter's question-framed title.

Following is an overview of the practical outcome (booklet) chapters and the reasoning behind each of them:

1. What the d-shop is:

The booklet starts with a presentation of what the d-shop is, in case it is used by someone who doesn't have any previous information on the d-shop. It then proceeds in explaining its offerings. Being operational for over a decade, the d-shop has had enough time to explore and understand its value propositions and user segments. In this section, research findings merge with existing material in presenting an overview of the 4 different d-shop offerings. In order to facilitate understanding, four quadrants were created, mapping two sets of polarities: focus - internal vs. external -, and type of user engagement – participatory vs. spectator –. This content section may be useful for users to understand d-shop's offerings, as well as for collaborators and leaders in strategically considering how to balance these four value propositions in their own initiative's location. It may be necessary to value some of those over others, depending on the circumstances, in order to avoid trade-offs (Osterwalder; Yves, 2010). Though the booklet doesn't discourage any of the offer/user combinations, it uses the most common and successful one (d-shop as an internal learning space, as indicated by preliminary research with d-shop's staff and later corroborated by user interviews) as a baseline for subsequent discussions, for practicality and clarity's sake.

2. d-shop's history:

The booklet presents a holistic overview of d-shop, starting from the very beginning: its origins. The d-shop's history was included as a validating and value-increasing piece of information, which aims at all types of readers, from users to collaborators and leads. Being a grassroots initiative, which focuses on the individual's innate power of creating something new, adopting the same process used for increasing value perception in handicrafts seemed plausible, by making explicit the link between the final product and its development, its history (Borges, 2011). This section would also promote understanding and further separation between the initiative and the company it is inserted in. d-shop leads want to make this distinction clear to the users, so that they understand the initiative is not managed from the top-down, but rather grown from the employee community, and thus depends on this community and on employee engagement to thrive. Employees also mention this distinction as a positive aspect, when stating: "I don't want to feel like I'm still at work when I go to the d-shop, I want to have a break from it and learn something new" (User research, 2017).

3. d-shop initiative growth:

A short overview of data, presenting the amount of countries and different SAP offices that have a d-shop. This information is shown as generically as possible, through a line chart indicating the initiative's growth, the idea being to provide a positive impression on the initiative through its continuous growth, while being generic enough to remain relevant for a considerable amount of time in print format.

4. How users discover d-shop:

This section starts the presentation of user interview results. It is particularly useful for current and upcoming d-shop leads and people interested in starting new d-shops. It discusses the three types of discovery mentioned by users, and plots them in a graph with two axes: effectiveness and occurrence rate. This content may be used to

propose informed decisions on marketing strategies, making the best use of this mix in promoting visibility to the d-shop.

5. Who the users are:

The intention in presenting a clear picture of the d-shop demographics is facilitating informed decisions by better understanding who those will affect. Rather than presenting an extensive list of user characteristics, needs, and wishes, their characteristics were clustered together and presented as personas. The choice for this type of presentation comes from the intention of uniting the comprehensive research data and the visual and engaging methodology used in presenting personas. A persona is usually created to remind designers of whom they are designing for, keeping them in track throughout the development process. The same outcome is expected here, with content creators identifying which users their workshops are targeting in the personified representations of clustered data. In this section, there is also the main distinction between shallow and deep knowledge, presented in a palatable manner, so that content creators better understand which type of audience they might be targeting, and establish parallels to the personified user characteristics, creating a unique and comprehensive mental model of the targeted user segment.

6. User's journey at the d-shop:

Presenting the user journey and current user experience is more useful for d-shop leads than any other group. It is a brief overview of current d-shop's performance, which brings up considerations about its operations and focus.

7. Contributing to the d-shop initiative:

Targeting prospect contributors, this section describes different roles an SAP employee can take at their local d-shop in order to support it and promote its growth. These roles were laid out by level of effort (lowest to highest), making the point that

there are a variety of different ways to support the d-shop initiative, which fits a diversity of people.

8. Creating content:

This is the area in which content creators will be prompted to actively assess how their expertise may best be compiled into content, depending on their targeted audiences (this section bridges the actual content development process to the personified user characteristics and needs discussed in section 5).

9. How the d-shop communicates with its audience:

In creating a line of content, it is important to maintain a consistent tone in each of the workshop documents. The d-shop's tone of voice, which is at essence an adaptation from SAP's own tone of voice¹¹, is presented in this section.

10. Visual communication at d-shop

Continuing the efforts of promoting consistency in d-shop's content, a set of minor guidelines is presented here, mostly referencing the main color scheme used in this project's practical outcomes. As the workshop templates will be presented as a finished fillable product, the remainder of the information is presented loosely as visual suggestions. The intention here is not to suffocate different d-shop locations and allow (outside workshop content, which might be reused in other circumstances) flexibility in how they represent themselves.

11. How to start a d-shop:

This is an important topic aiming readers who are considering opening a d-shop at their own SAP location. It is purposefully placed towards the end of the booklet, as

¹¹ www.sapbrandtools.com/tone-of-voice

all of its content is useful for this particular type of person. They need to have a general idea of all aspects of running a d-shop in order to finally decide if they are fit and willing to follow through with this challenge.

12. d-shop's best practices:

Finally, the last section of the booklet is a compilation of best practices. This information is useful to anyone willing to open a new d-shop location, but also as a set of guidelines anyone involved in maintaining a d-shop can refer to from time to time.

Considering the intended longevity of the printed booklet, some time-sensitive information was kept out. This includes, for example, a map of all current d-shop locations and contacts for global d-shop leads. The volatility of this information would detract from the value of the booklet in a very short time, and would thus be out of context when printed alongside longer-lasting information, such as the d-shop's history, offerings and best practices. In preventing the exclusion of these volatile pieces of information altogether, it was opted to create "cards", which would be detachable appendices at the end of the booklet. In case this content becomes outdated, it can be easily disposed of, and updated information can be printed to replace it. This vastly improves the longevity of this project's tangible outcome.

In addition to time-sensitive information, the "cards" section will also include the "decision" part of the 3-step system solution to standardized workshop content creation. The reasoning behind this separation from the main content comes not from the fact that it might lose relevance overtime, but it actually follows the physical separation of this 3-step methodology: the insight phase will come from understanding d-shop's users and context through the booklet, the decision phase will be completed through exercising elucidating decisions with the decision-making tool card (at the end of the booklet), and, finally, the action phase will be completed digitally with the fillable workshop templates offered (Word and PowerPoint). Having each of the three steps of the proposed solution physically separate allows them to be consulted simultaneously.

The fact that this booklet is a mix of novel and previously existing content makes it necessary to explicitly distinguish which content has not been created by the project's author, but rather by the d-shop's global lead, Julien Vayssi re (2016). These sections are: "What is d-shop's organizational structure?"; "How do I start a d-shop?"; "What are the d-shop's best practices?"; and, also, d-shop's name and mission descriptions under "What is d-shop's history?". Any information on the number of d-shops in existence, their location, and their lead's contact information (removed from this document for personal data privacy reasons) has also been catalogued by Vayssi re (2018). In order to match the tone and writing style of the booklet as a whole, this third-party content has been reformatted and rewritten.

4.3.2 Decision-making tool

This decision tool (appendix 2) was inspired by the Business Model Canvas tool (Osterwalder; Pigneur, 2010). Being that "A business model describes the rationale of how an organization creates, delivers, and captures value" (Osterwalder; Pigneur, 2010. pp. 14), it was decided that implementing business concepts to the creation of workshops would be beneficial in facilitating sense making. The "Business Model Canvas" tool, proposed by Osterwalder and Pigneur (2010) could be adapted to the narrower needs of a d-shop content creator, allowing them to better make sense and pin down concepts such as targeted audience, type of content and its distribution, etc. (with the help of the booklet's insights).

The Business Canvas tool consists of several different "building blocks" which represent all areas of concern in creating a business plan (Osterwalder; Pigneur, 2010). Some of these areas, though, do not concern activities of creating workshop content, and were therefore excluded (e.g. cost, as d-shop funding is dealt with by the d-shop leads; revenue, as the workshops are freely available to users, etc.). The resulting blocks used in the framing of the decision-making tool's questions were:

1. Key partners:

It is important to be aware of the surroundings at SAP, as the astonishing diversity of teams and projects might mean that there is already internal knowledge which might be sourced in developing workshop materials, serving as demos or use-cases (especially valuable when there are examples of the connection between the technology and SAP), etc.

2. Customer segments:

Another important reason for evaluating SAP's internal scenario is locating potential knowledge niches that are unaccounted for. Developing content that is needed by internal teams is a great way of easily attracting an audience. Other consideration in this area is the level of depth in which this knowledge is demanded: from shallow to deep. This will affect how the content is presented, in how much detail, and in how many different installments it is divided in.

3. Value proposition:

When considering depth of knowledge, there is a direct link to be made with the type of need being addressed by each of these levels. The three main types of value propositions identified in the sense of workshop content are:

- Igniting learning: This proposition aims at the shallow level of knowledge and its needs;
- Drill-down learning: Closer to the deep knowledge extremity of the scale, it builds upon already existing content (or requires previous knowledge);
- Punctual solution: It aims at solving specific problems, not exploring knowledge (and was therefore not examined in-depth during this project). This has a vague relation to surface knowledge, as it doesn't engage the user as much as the other value propositions.

4. Channels:

Different value propositions might be best suited for different channels. While the majority of standardization guidelines proposed in this project concern either text manuals or slides, it is still possible that some technologies might be best presented in video or other types of media.

Proposing the use of the decision-making tool before the actual workshop development process is useful in terms of providing a mental break, in which the content creator is invited to step back from a “creation mode” into a “reflexive mode”. This incentivizes them to clearly define their intentions and, potentially, challenge preconceived assumptions. This would create better alignment and clarity in the development phase.

Such as other design tools that are not generative, but rather play supportive roles in projects (e.g. personas, moodboards, etc.), this positioning tool would not only be a starting point, but also a reference document throughout the workshop development, ensuring alignment.

4.3.3 Workshop content template

From the existing content analysis, a few different means of content delivery were identified in d-shop:

- Expositive: either highly complex content which cannot be properly taught in the “hands-on” context of d-shop, or content aiming more at awareness than practice (focus: theory/demos).
- Enabling: workshops presented as a theoretical and practical basis, aimed at enabling users in understanding and using some technology (focus: theory/exercises).
- Targeted: guides users in achieving specific results with specific technologies (focus: theory/problem-solving).

Targeted content is currently not necessarily made available in the format of a

workshop, as it is quite specific. These contents are important, but are not as impactful to the users' development as the other two means of content delivery, which have a longer-lasting premise than just solving a single issue. This doesn't mean, though, that targeted workshops cannot benefit from this project's solution in the same way as other types of content delivery.

While expositive workshops rely more on demos and visual material to promote content retention, enabling workshops rely more heavily on practical exercises for this purpose. A d-shop lead (Expert interviews, 2017) argues that having visual or tangible aids, especially in software presentations, makes it easier to comprehend and recall intangible concepts.

A total of 18 workshop materials were examined in order to understand the current state of workshop content and presentation in the d-shop. They are mainly shared on internal SAP-owned platforms such as Jam, but on occasion also in other platforms, e.g. GitHub. The lack of formatting cohesion in d-shop's workshop content portfolio was the most easily identifiable issue, in terms of standardization, the d-shop presents. Each individual document shares no relation to the others, when these are created by different authors. As a matter of fact, content can easily be visually clustered by authors, but does not have any distinguishable features or connections which would indicate that they are part of a single initiative's content portfolio. Being that this is such an obvious and noticeable issue, it was decided to not only provide content creators with best practices in workshop development and type of content, but rather present these considerations in the format of fillable templates, thus assuring visual cohesion in d-shop's content portfolio.

When considering user's unstructured interviews, reported workshop content sequence cannot be considered as being fully accurate, because it involves user's recall of the event. It can be argued, however, that reported experiences are an accurate reflection of the individual's experienced reality, evidencing the most memorable experiences of the event, positive or negative. This can potentially tell more about their experience than actually providing them with a summary of the workshop to guide this discussion.

The different content sections identified through analysis of the d-shop existing

materials and user interviews (2017), are presented in table 1 (numbers and letters are labels to the steps presented in image 4):

d-shop material workshop content order	User experienced workshop content order
1- Title, call-to-action, image, purpose, general information	A- Expected outcomes, purpose
2- Prerequisites, materials needed, how to obtain access to software	B-
3- SAP's relationship to the technology	C- Relationship with SAP
4- Course's agenda, contents	D-
5- Subjects' history, constituting parts, possibilities, challenges, importance, similar technologies	E- Explained what the technology is, how it works and what it is used for / possibilities (14) (in 2 cases the relationship with SAP was mentioned)
6- Hardware info, similar hardware, prices, where to find, setup, testing	F- Setup/preparation
7- How the technology works, how and what it is used for, challenges, hardware/software basics, constituting parts	G- Basic practical info, examples of outcomes
8- Technology/hardware demo, how it functions, detailed info	H- Demo, detailed info
9- How to use technology and tools to achieve desired results, creating and implementing, exercises	I- Project development, individually or in groups
10- Troubleshooting, contact information, invitation for collaboration	J- Expected issues, invitation for continuation courses, producing (printing) tangible outcomes from the workshop
11- Further steps, suggestions, challenges, complementary links and references	K- Slides shared, Further development suggestions / links, On-demand (by attendees) content presentation
12- Exercise solutions, codes, summary of what was learned	L- Main takeaways

Table 1. Content order comparison: current workshop documents average content order vs. user reported average content order. Source: The author.

Comparing user-reported experiences with the thorough analysis of content

available at d-shop’s global Jam page provided a good contrast between factual reality and experienced reality. As neither the user-reported workshop content order nor the existing d-shop documents’ content order were perfectly consistent, similar types of content were clustered together to facilitate analysis and comparison. Even so, not all clusters were represented in both contexts, and surely not all were mentioned with the same frequency. In image 4, the amount of mentions/occurrences of each content cluster is represented by the size of the circles. Image 4 makes clear the large variability in both user-recalled workshop content, as well as in documented workshop content.

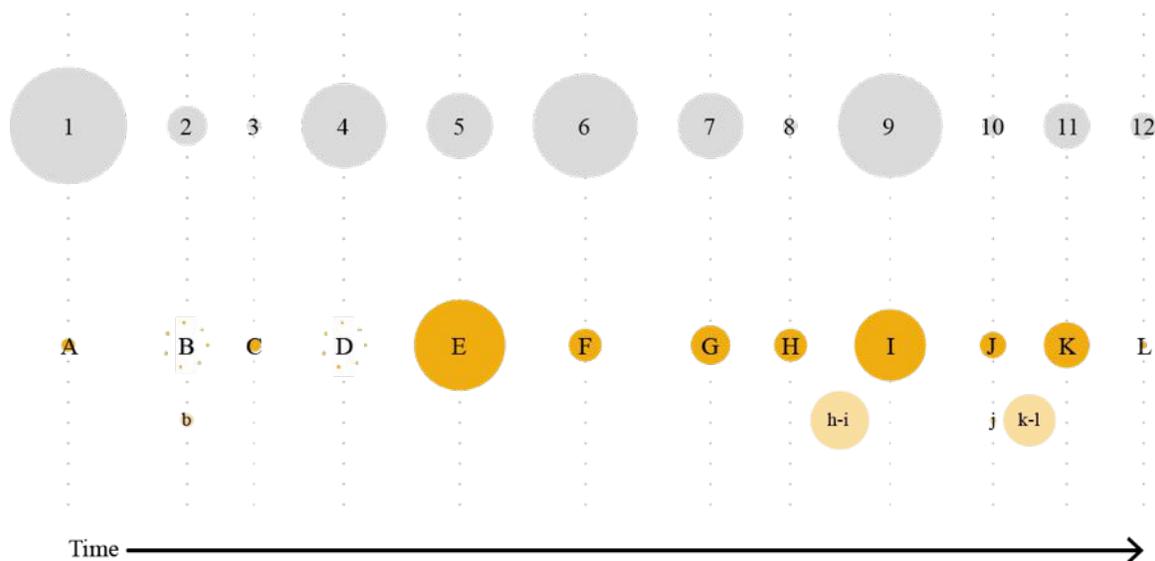


Image 4. Frequency of user mentions/occurrences in existing workshop materials, for each of the different content clusters. Source: The author.

In addition to a few missing steps (B and D), some of the steps reported by users (represented in image 4 as the light orange circles) were not identified in the analysis of available workshop material. These are interactions that only occur in the context of a live-presented workshop (e.g. introduction to the d-shop initiative and facilities, briefing for exercises and Q&A). As the proposed outcomes of this project affect only the content creation/documentation, these additional sections will not be considered in dealing with workshop materials.

Despite there being a clear set of clusters which are relevant in d-shop

workshops, the variance in amount of mentions/occurrences of certain content clusters also implies that different workshops may need to operate outside a constant rule.

A Design Thinking coach in SAP (2017) suggested modularity as a possible solution to this issue, so that parts might be added, removed or substituted according to need, while still following the basic proposed outline (Expert interviews, 2017). This leads to a concrete yet flexible tool in the development of new d-shop material, allowing its further development, and will thus be the approach taken in the fillable templates (appendices 3 and 4). Similar approach was noted by Meuter (2009) as being successfully employed by teachers of standardized university courses, who followed the same syllabus template, which was, though, flexible enough to allow customization (Meuter et al, 2009). This will ultimately prevent “...constricting the scope for learning and progress via experimentation and the selection of superior variants” (David; Rothwell, 1996, pp.186), as the proposed ‘superior variant’ will be flexible enough to accept modification when absolutely necessary.

It is important to once again state that the content templates may not fit all future content development purposes, and therefore might be used as a starting point rather than a fixed and unchangeable “workshop mold” when necessary. The fillable template is important in the sense of presenting the content creator with the gist of content seen as necessary for a comprehensive workshop, so they will have the opportunity to take an informed decision to somewhat deviate from it, be that necessary.

Despite being considered as clusters of content and building blocks that can be moved back and forth, a fillable template is an “object”, and as such, it needs to present those clusters in a certain order. The final proposed content clustering combined a few of the identified workshop steps (presented in table 1) together, due to similarity in purpose, resulting in 9 main clusters. Its proposed order was:

1. Title, pre-requirements, expected workshop timeframe, workshop's purpose, expected outcomes
2. Workshop contents / index / blueprint
3. Materials needed / how to obtain them
4. Why is this being presented in the context of SAP?

5. How the technology works, its history, how and what it is used for, challenges, hardware/software basics, constituting parts / demos / setup
6. Achieving desired results through the technology / implementation / exercises
7. Troubleshooting
8. Further steps, complementary information, challenges
9. Main takeaways, summary / solutions and codes to exercises which require them

In validating the initial order established (from the narrated user experiences and the studied existing workshop documentation), six d-shop content creators were invited to rearrange these building blocks as they saw fit (these clusters of content were presented in a random and non-linear arrangement, to prevent any unwanted skewing of results).

Considering the workshop progress as a succession of these 9 clusters in 9 possible positions, the content order proposed by the interviewees (Content creator interviews, 2018) allowed the observation of overlaps in their responses. These varied from perfect matches (6/6 matching placements), near-perfect matches (5/6 matching placements), close matches (4/6 matching placements) and 50/50 divides, (3/6 matching placements). The final cluster order was defined by the highest number of overlapping placements in each of the 9 available “slots”. The numbers used in table 2 take as basis the initial proposed content cluster order:

Initial proposed order:	1	2	3	4	5	6	7	8	9
Content Creator 1:	1	4	5	6	8	9	7	3	2
Content Creator 2:	1	4	3	2	5	6	9	8	7
Content Creator 3:	1	2	4	3	5	6	7	9	8
Content Creator 4:	1	2	3	4	5	6	7	9	8
Content Creator 5:	1	2	4	3	5	6	9	7	8
Content Creator 6:	1	2	4	3	5	6	7	9	8
Final averaged order:	1	2	4	3	5	6	7	9	8

Table 2. Establishing the final workshop content cluster order, from the average of interviewed content creators’ proposed ordering. Source: The author.

The final content cluster order, established from the average of the content creator's proposed orders, is:

1. Title, pre-requirements, expected workshop timeframe, workshop's purpose, expected outcomes
2. Workshop contents / index / blueprint
3. Why is this being presented in the context of SAP?
4. Materials needed / how to obtain them
5. How the technology works, its history, how and what it is used for, challenges, hardware/software basics, constituting parts / demos / setup
6. Achieving desired results through the technology / implementation / exercises
7. Troubleshooting
8. Main takeaways, summary / solutions and codes to exercises which require them
9. Further steps, complementary information, challenges

In this final content order, two sets of clusters have swapped places amongst themselves when compared to the initially proposed order, pre-established when comparing user's narrated journeys and existing workshop material. These were:

- Materials needed / how to obtain them
- Why is this being presented in the context of SAP?

In this case, content creators felt that the workshop's context within SAP topic belonged with the workshop's presentation, in order to set the stage for the theoretical/practical content to come. They also showed preference in connecting the materials needed section to what they saw as the "second stage" of the workshop, in which these materials' usefulness is explained and where they are used.

- Further steps, complementary information, challenges
- Main takeaways, summary / solutions and codes to exercises which require them

Content creators saw the main takeaways, summary, and solutions to exercises as being the final step in the workshop's theoretical/practical development part. This successfully closes it, before moving onto what could be done after it, which is represented by further steps, complementary information, challenges, etc.

This observed difference is in no case a drawback, as the initial workshop order was an average of all examined material and interview results. When the desire of this project is not replicating existing paradigms in workshop content creation and delivery, it is important to have this current arrangement challenged by people who have already been involved in the process of developing workshops, as they are a representative subset of the people who will implement this project's proposed 3-step solution tools.

The project's proposed templates will be created with the primary intention of internal use at SAP. Expanding d-shop's target audience beyond the walls of the company has the potential to make SAP look more approachable and in sync with current technology (Expert interviews, 2017), but the current operation of d-shop would have to be drastically altered for this to happen. Putting out content which is individually sourced and labeling it as originating from SAP would require a thorough development process and exceptional quality standards. This would stop content production at d-shop on its tracks, as such processes are incompatible with voluntary individually produced content, in the explorative and do-it-yourself approach and ecosystem promoted by d-shop. The lack of strict content control in any externally distributed and SAP branded content could have the potential to damage the company's image, according to an industry strategy and portfolio manager (2017) (Expert interviews, 2017). For this reason, no strategies for external content distribution will be discussed.

4.3.3.1 SAP's Brand Tone

Workshop content creation in d-shop is, as already discussed, a collaborative endeavor of many different collaborators to the initiative. Every person has their own style and preferences regarding content presentation, though, which leads to current

content portfolio looking and feeling very diverse, in a way that it is difficult to grasp a true d-shop tone and brand identity. There are already guidelines on tone, visuals, and presentation styles enforced by SAP¹², but the d-shop, in its internal focus, has the opportunity to take on a flexible approach to these guidelines. This can be seen as an advantage, as users perceive the d-shop mostly as being separated from their work life, and don't want to be reminded of its pressures while they are interacting with the initiative (User interviews, 2017). That all being said, the d-shop and SAP's identities should not be like oil and water, there has to be a balance between both. Luckily, many of the precepts from SAP's branding work equally well in the d-shop's context.

This project is not a branding effort. Despite that, the practical outcome of this project needs to be presented in a tangible way, and thus needs to follow some formatting principles. In facilitating this process and maintaining some level of relationship with SAP, many of the d-shop's proposed formatting and visual concepts will be adapted from existing SAP branding and materials, described further ahead.

While d-shop operates under the umbrella of SAP, it is expected to be more flexible and open than the company itself is. This in no way presents a critic to SAP's operations, it only highlights the different expectations and experiences which collaborators and users alike have. These opposing forces are noticeable in the d-shop's desire for individualization, made evident by some one of its leads (Expert interviews, 2017), while still operating under the formal constraints of the company. Despite there being some tension in this area, the brand voice which has already been formally established by SAP doesn't conflict with d-shop's ideals, if anything, it endorses them. Therefore, by convenience and for maintaining some unity to SAP, the existing brand voice will also be adopted.

The company's brand voice pillars are: clarity, insightfulness, approachability and optimism (SAP, 2013). These are presented as ingredients rather than fixed values (SAP, 2013), which can therefore vary in expressiveness accordingly to the circumstance and type of media. Let's break these attributes down to their constituting characteristics, focusing specifically on characteristics that are crucial to the d-shop's communication regarding workshops:

¹² www.sapbrandtools.com

- Clarity:

Clarity means using “...simple, comprehensible language” (SAP, 2013 pp.28). SAP’s brand identity (2013) instructs breaking-down technical complexity and avoiding jargon. The perceived high entry level of some workshops may keep less technologically oriented users from experiencing d-shop (Brainstorming exercise, 2017), thus the need to use a language that is clear to all. Additional guidelines given for language clarity are the use of active voice and short sentences/paragraphs (SAP, 2013).

- Approachability:

Approachability is fairly related to clarity, in the sense of using colloquial language in a conversational tone, which should sound inclusive to all users (SAP, 2013). Considering the wide range of users the d-shop targets, from a variety of different backgrounds, this aspect cannot be undermined. Approachability also improves the user’s feeling of participation in suggesting the use of the collective pronoun “we” (SAP, 2013). Finally, using real-life examples and analogies is another aspect that increases approachability, as well as being an effective way to promote the retention of abstract concepts (Expert interviews, 2017). Norman (2008) makes the case that even if designs are beautiful and functional, it doesn’t mean they engage the user emotionally (Norman, 2008). A friendly, approachable tone can act as a facilitator for emotional connection, especially in a case in which complexity is inherent.

- Insightfulness:

Insightful, in SAP’s brand identity (2013), means knowledgeable, helpful and enthusiastic (SAP, 2013). It is also proposed that the big-picture be communicated. In this attribute we find one suggestion for insightful communication which goes against what should be d-shop’s tone of voice: “Focus on problem-solving rather than on

features or processes” (SAP, 2013 pp.36). d-shop’s communication has to focus on all aspects of the project development, and not only in results. While the undesirability in detailed communication of features and processes is understandable when dealing with clients, it is absolutely necessary in a learning scenario.

- Optimism:

Optimism is defined by SAP’s brand identity (2013) as being confident. This plays well in the business scenario, where SAP has to be confident of the products and solutions it releases to the market and how it communicates them to their customers. The d-shop, on the other hand, is a place of experimentation where mistakes are part of the daily routine. d-shop users argue that the identity distancing of d-shop from SAP is beneficial, when removing its users from the corporate scenario in which they don’t feel comfortable in exploring and making mistakes. In d-shop, mistakes are celebrated as part of learning (User interviews, 2017). That being the case, optimism, while being a desirable mindset, is not necessarily one of the main aspects in d-shop’s brand voice, at least when it concerns confidence in a perfect and direct path when searching for any given outcome. Other mentioned characteristics, on the other hand, e.g. passionate and inspirational, completely match the desired d-shop tone of voice.

As “Each communication requires its own ‘blend’ of attributes, combined in a way that suits the appropriate tone for specific objectives and audiences” (SAP, 2013 pp.24), after considering which aspects might best suit d-shop’s intentions and user expectations (according to the research), the proposed d-shop tone of voice should use the following distribution of values as an approximate guide (image 5):

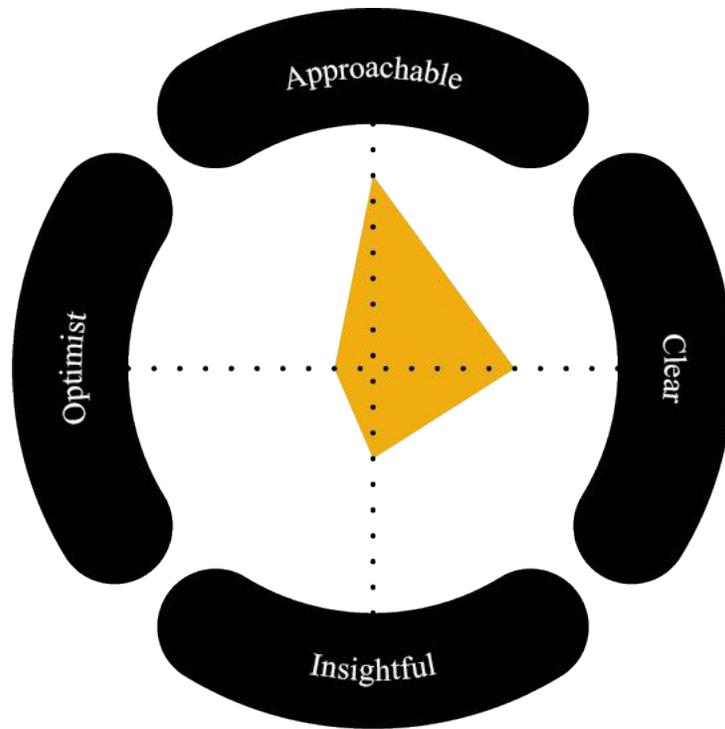


Image 5. General distribution of tone of voice aspects' proportion, proposed in d-shop's communication.
Source: The author.

While evaluating current d-shop content, it was noticeable that there is some variance in compliance to these attributes. Most noticeable is the variance in approachability. This is understandable due to the nature of some of the presented technologies, which might be truly complex to any user who is illiterate in the topic and not very in touch with technology. The high entry level for many courses, when considering non tech-oriented users, has been pointed as one of the most important issues the initiative faces by $\frac{1}{3}$ of d-shop staff's (Brainstorming session, 2017). This is also why "approachability" is the most important characteristic in d-shop's adopted brand voice. The use of analogies and more relatable examples has been mentioned as a possible way to reduce the perceived knowledge entry barrier (Brainstorming session, 2017), reinforcing the need for implementing approachability in developing (and even divulging) content.

4.3.3.2 Available layout template analysis

From the pool of current SAP template guidelines, two formats will be focused upon due to their relevance to this project, in both physical and digital media. For physical media, a series of Word templates in A4 paper format were chosen, for analysis. They would inspire templates for physical workshop content manuals. In digital media, PowerPoint templates were chosen. Being available in both 4x3 and 16x9 formats, it was decided to restrict the analysis to the 16X9 format alone, as most modern monitors follow this aspect ratio. This will improve the experience of users consuming this content individually, on a regular screen size. For presentation purposes, this format would also best suit televisions and other larger screens, while in projections (largest format considered) there would be black bars above and below the content, which would not affect the use of the content to a large extent.

In A4 format, three templates are available, varying in size (short and extended content), type of table of contents (numbered, list) and the presence/absence of image placeholders and blank pages. The main identifying visual feature, which is present in all pages (except the copyright/trademark page) and brings unity to the template, is the SAP Motion Band graphic located at the top of each page. The SAP logo and motto are positioned in the lower left corner in the first and last pages of the content.

The PowerPoint templates are more varied than the Word ones. There are three main stylistic options to choose from: a black theme, a white theme and a mixed theme (title and divider pages are black, while content pages are white). All of the themes have diverse options for title and divider pages, affording content that has images, pictograms or just plain text. All title pages include SAP's logo and motto at the lower left corner, and some title pages offer the option to add or not the SAP Motion Band graphic. The same is true to the content pages, with a comprehensive variety of text and image combinations. All content pages also present the Motion Band on the very top of the layout (black bar and overlaid SAP gold in different opacities [the single exception being a full-screen image placeholder page]). The font used is Arial, in black or white color depending on the background, and with SAP gold being used in accent text and subtitles. SAP gold is also used for bullet-points throughout the document.

The main visual commonalities between the Word and PowerPoint templates are

the use of a motion band (black bar overlaid by SAP gold in different opacities) above the content, and the SAP logo/motto at the lower left corner.

The available templates are promoted in a branding tool which is not linked in any of the d-shop's current support documents at its Jam page, and this might be one of the reasons for the style variance in d-shop's workshop content portfolio (Content creator interviews, 2018). Coming from the official brand management team, there is already most certainly a quality assurance to the material. Similarly to SAP's brand tone, the branded templates are not inconsistent with the d-shop initiative, and will, therefore, be used as basis for the d-shop's templates, with minor stylistic changes for differentiation between both.

4.4 Proposed visual direction for d-shop:

The visual inspirations taken in the development of this project's tangible deliverables (booklet + cards, workshop templates), as well as the unified d-shop logo proposal (a separate project, completed before this one), were taken from the intersection between technology and manual processes. These two areas adequately encompass the d-shop's experience concept, of teaching technical information in a practical manner, based on tinkering and experimentation. Following is an explanation of the main aspects used when creating a basis for what could be d-shop's visual identity in the future. As each d-shop location is given a high degree of freedom, their visual identity is very disperse, to the point where there is not even a unified logo. That has been identified by d-shop leads and staff alike as a big issue, when the only thing connecting the different locations from an external point-of-view is the name and general concept (Expert interviews, 2017; Brainstorming session, 2017). While a unified logo could be enforced by the global d-shop lead in new coming locations, it is difficult to imagine already established d-shops would give up their own logos, in case they were locally developed. As Norman (2008) discusses the entanglement of symbolic and social functions with the materiality of products (Norman, 2008), the locally created logos for different d-shop locations may carry a heavy sentimental value, which might offer resistance in the consolidation of a unified d-shop brand. When researching

existing d-shop workshop material, it was clear to see that there aren't even locally established templates for content creation/presentation. This unaccounted for niche proves to be a more promising entry point in standardizing d-shop visual branding throughout locations, as there is no existing material to replace in this scenario, as opposed to the logo proposal. The lack of existing obstacles in this area increases the chance for adoption of this material. Despite not being of mandatory implementation, it is hoped that other d-shops may be inspired by the visual elements used in this project, indirectly promoting some visual consistency between locations.

1. Industry/technology:

Taking d-shop's connection to machines and gadgets as a starting point, it was decided to draw inspiration from industrial settings for d-shop's visual proposal.

- Assembly manuals: d-shop workshops are usually accompanied by manuals, explaining the step-by-step needed to reach certain results. The manual taken as visual inspiration for this project is the IKEA one (image 6), in which simple linework-based imagery plays a big role in conveying information. This linework, alongside the d-shop logo, inspired the booklet's illustrations.

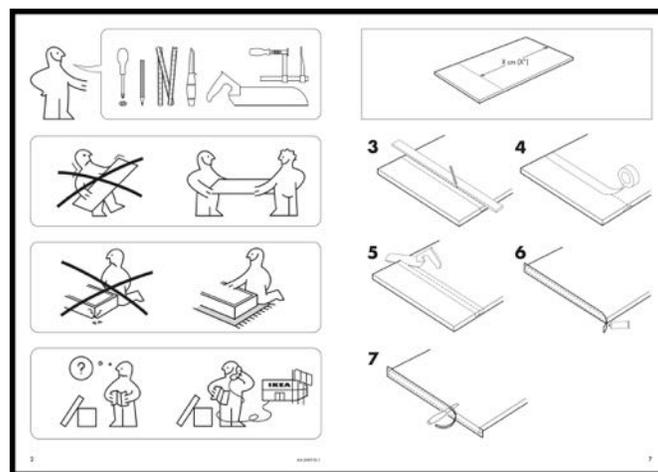


Image 6. Excerpt of IKEA's Gimån furniture assembly manual. Source: Inter IKEA Systems B.V. 2006. Available at: www.ikea.com/ms/en_US/customer_service/assembly/G/G30117409.pdf.

- Industrial color scheme: The idea here is to recreate the hard color contrasts seen in industrial settings, so the colors used for that are yellow and black (also common colors in tools, again pointing at a relationship with the d-shop). As seen in image 7, an achromatic scheme is used in the background, the context. Items that require attention, such as moving parts, are highlighted in yellow. To promote connection to SAP, the color used for highlight in all deliverables is SAP gold, one of SAP's primary brand colors.



Image 7. Industrial setting. Source: Jervis B. Webb Company, Sarah Carlson, Marketing Director, 2007. Available at: www.upload.wikimedia.org/wikipedia/commons/8/88/Inertial_guidance_AGV.jpg.

2. Maker/manual processes:

The d-shop, despite being a place where a lot of cutting-edge technology can be found, is also a place of experimentation and manual making. In celebrating experimentation, a few elements of imperfection were chosen to counter-balance sterility of industrial precision.

- Silkscreen layering: When printing more than one color in silkscreen, it is difficult to perfectly align the different layers to each other. This somewhat uneven overlay can give the illusion of movement and depth. It also pays

homage to manual processes, and could be used in d-shop’s upcoming visual communication. The overlaying of the d-shop logo to a solid 2-color background (e.g. booklet’s cover) is one example of the application of this inspiration.

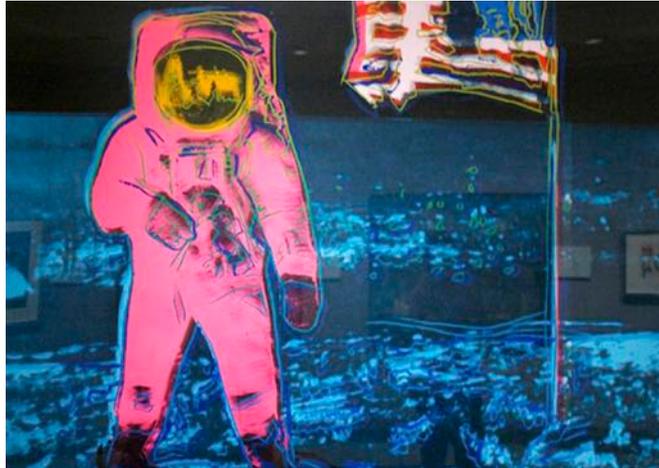


Image 8. Example of “imperfect” silkscreen overlay, giving the impression of tridimensionality. Source: NASA on The Commons. Moonwalk 1, by Andy Warhol, 1987 (silkscreen on paper). Available at: www.flickr.com/photos/nasacommons/8973491920.

- Halftone: Part of the inkjet printing process, for example, halftone aims at creating different shades by printing different sized dots of color at different distances. When magnified, these dotted patterns can be easily seen. The halftone has been a main inspiration in creating the d-shop logo (at an earlier project), in which each letter is originated from a circle of constant size.

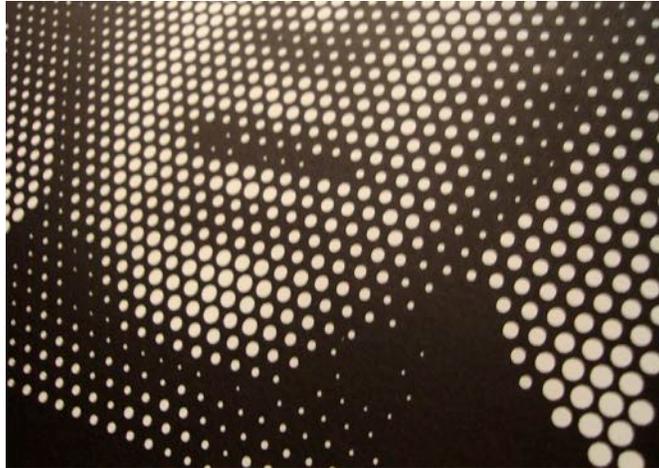


Image 9. Visual example of halftone concept. Source: FabLab Den Haag (laser cut paper). Available at: www.flickr.com/photos/cabfablab/3448054386.

3. SAP:

d-shop does not want to look like a clone of SAP, but it still needs to maintain some visual cohesion with the company, as it is inserted in its context, as already discussed. In promoting this cohesion, a few elements were used as an inspiration and then transformed into something new.

- Primary color/motion band: The use of SAP's primary color has already been justified as a substitute for a generic yellow. The motion band is a graphical element that uses this primary color as an overlay, in different opacities, to images or blocks of color. While the primary color has already been proposed as the d-shop's primary color, due to its relationship with industrial machinery and tools (aspect that connects well to d-shop's identity), the motion band might be used similarly to the silkscreen layering proposition.



Image 10. SAP’s motion band overlaying photo. Source: www.sap.com/index.html.

- **Iconography:** The current SAP iconography is composed of a simple and bold linework, and makes use of the motion band concept in overlaying secondary branding colors with SAP gold, in areas of highlight. These simple and striking outlines, with smaller colorful portions of interest, were used as inspiration when illustrating the booklet (most notably in the areas where user characteristics were personified and presented as characters).

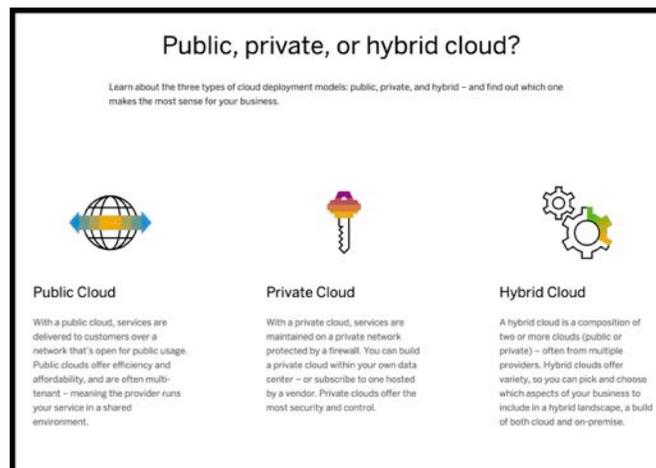


Image 11. Three examples of SAP’s icons. Source: www.sap.com/index.html.

5. Conclusion

On the risk of sounding inconclusive, it could be said that this project is only a beginning. Due to the required workload in applying the workshop standardization system retroactively to existing content, it is hardly expected that this will happen. While part of the project's outcomes (such as the research insights) may have an immediate impact in both the user's perception of d-shop and vice-versa, observable results from the implementation of the workshop standardization system will happen over a longer timespan. This is due to the fact that content renewal at d-shop takes time, as it follows relevant technological developments. The time it takes for the newly developed workshops to be presented enough times for results to be visible also has to be taken into consideration, in order to have a relevant sample for comparison prior and after the introduction of this system.

This project presents a hypothesis (research question) and a solution system to meet it. There are measurable elements that are linked to the hypothesis (e.g. an increase in the numerical value of d-shop collaborators and/or in the recurrence of d-shop users), whose improvement would provide factual evidence of the validity of the proposed solution system. These would, though, require carrying-on a comprehensive study following the actual implementation of the solution system.

The d-shop already has a portfolio of workshops, albeit in an inconsistent range of formats. The proposed solution, as a facilitator of content creation, can be expected to be adopted when new content is being generated, which will then, as time passes, substitute the existing content. This makes it impossible at the present time to quantitatively measure the acceptance of the tool, until its presence in the d-shop content portfolio is prevalent over other types of unstructured content. Due to this, the solution system will be presented to expert content creators, who will in turn evaluate its validity through the lenses of their own experience and determine the expected success of this project's standardization system proposal.

The main obstacle faced by this project's outcomes is having a committed widespread support in its implementation. Meuter (2009) has seen this as a critical element in his project's success, and noted to the difficulty in succeeding when not having this support network. The perceived reduction of freedom might play a big role

in this aspect (Meuter et al, 2009), so it is necessary to present this tool as a flexible foundation structure in which content creators can build upon.

Additional value is also being provided in the compilation of existing d-shop content and research results, especially for locations that are considering opening their own d-shop. Utilizing Service Design tools and methodology, it was possible to analyze and describe the complete journey (both physical as well as emotional) users undertake when engaging the d-shop. These insights, compiled in the booklet, are in and of themselves a valuable outcome, in their power of clearly visualizing information that could otherwise go unnoticed, without the proper documentation effort, or even take longer to be gathered through experience.

As a final remark, it bears repeating that the intention in standardization is not reducing a comprehensive and explorative initiative into an inflexible and restrictive teaching format, which more closely resembles formal education systems. It is actually the increase of taught content quality, and the creation of a solid and common base of knowledge to all workshop participants regardless of background, that are the main expectations from the successful implementation of this project's deliverables.

On the other hand, it is neither the intention of this project to constrain the d-shop into a solely content-provider role. After acquiring a solid base of knowledge through workshops, users are welcome to continue their exploration and learning journeys with the d-shop, using its network and facilities, then transitioning from the shallow knowledge area into the deep knowledge realms presented by Alex and David Bennet (2008).

5.1 Further steps

In this subchapter, a non-exhaustive list of possible further developments stemming from this project and its research is proposed:

- The establishment of a common identity amongst d-shops is seen by some of the initiative's leads and staff (Expert interviews, 2017; Brainstorming session, 2017), and by users alike (User interviews, 2017) as having great potential in

improving global cohesion and value of the initiative. Better interconnecting the initiative could increase its visibility in the company, while facilitating knowledge exchange not only between d-shops and users, but also between d-shops themselves. Identity is a topic that was only briefly discussed in this project, as elements of branding and identity were tangent to the discussion of a unified content creation template. It could be, though, a topic for an entire new project in the future.

- Towards the future, d-shop-led experiential learning could be internally accredited, evidencing the user's portfolio of knowledge, which may assist in the mobility of employees inside the company. For this purpose, there needs to be an appropriate way of assessing and certifying such learning (see APEL¹³ system for a practical example). This would even be a further motivator aspect to users: "I would like to receive some sort of certificate of workshop conclusion after engaging the d-shop" (User interviews, 2017).
- Having a consistent template for content creation opens up the potential to better understanding and quantifying success, which remains one of the most successful strategies in convincing higher management to invest in d-shop as an initiative (Expert interviews, 2017). As put by Meuter et al: "All of these standardization efforts facilitate the interpretation of assessment of knowledge and skills across course sections" (Meuter et al, 2009 pp.112). Quantifying results could also direct feedback gathering, which could be used in continuous improvement efforts.
- The d-shop could promote, in the future, some sort of meeting or collaborative platform for the creation of content, benefitting from the knowledge of many expert individuals in a subject, rather than only one expert per workshop content. This could more easily be done in-person, as Meuter (2009) has identified in being a consequence of proposing a unified content to many course tutors. Each would have a different input, and hearing their voices led to the creation of a sound material, which incorporated the knowledge of all different parties. The involvement of diverse people in the conception of a strategy leads

¹³ Accreditation of Prior Experiential Learning.

to a less biased and more comprehensive final result (Osterwalder; Yves, 2010).

6. Discussion

As already argued, this project's outputs would take time to be implemented to a degree that there would be observable quantitative outcomes. This assuming there is sufficient data on the present d-shop's performance to be used as a baseline for comparison, which doesn't seem to be the case in many d-shop locations (Expert interviews, 2018). For this reason, it was decided that outcome validation would be sought in both analogous projects as well as in d-shop content creators' assessment. As they had already created workshops in the context of d-shop, they were considered able to assess how having the 3-step workshop creation tool could have assisted them, should it have been available at the time, as well as extrapolating the results from using it in a broader context.

Content creators have identified elements of this project's proposal being implicitly implemented in their own thought process when creating workshops: "I have been doing this intuitively, but this is the first time I am prompted to formally think about how I structure content sections in a workshop formatting" (Content creator interviews, 2018). They have seen the value in the 3-step workshop content standardization proposal in avoiding the need for lengthy trial-and-error experiences in developing content which resonates with the users, giving the people developing content a frame to work with, as "People like the feeling that everything is on track" (Content creator interviews, 2018). This facilitates the understanding and distinction between what is considered as the main content and what is supplementary information in the context of a d-shop.

This brings us again to the matter of modularity. Being that each content creator had a different set of experiences and mental models of what a workshop should look like, it was clear to see that the proposed modularity in the use of templates was indeed necessary. This was not necessarily related to the presence or absence of content, but also its positioning (as seen in table 2, not all content creators agreed 100% in the positioning of all content clusters).

Overall, all content creators have seen this project's proposal as beneficial, with some of them even identifying elements in the proposed content structure that was missing in their own workshops. "Usually collaborators are enthusiastic developers, not

trained instructors” (Content creator interviews, 2018), and could therefore develop content of higher quality when having guidance, while also being more motivated to do so, with a smaller initial effort being necessary (Content creator interviews, 2018).

Long-term, the implementation of the workshop standardization system is expected to streamline d-shop’s operations. “From 'order' one can derive greater predictability, the perfection of performance (...) the economies of simplification...” (David; Rothwell, 1996, pp.185). Considering most d-shop locations operate on a volunteer basis, the facilitation of content reuse may be seen as a welcome implementation outcome. Content creators mention this as an opportunity for developing interoperability between different d-shop locations.

Challenges mentioned regarding this project’s implementation mainly revolved around its human-factor part of the equation. Content creators mentioned that people might be reluctant in changing their actions and in accepting standardization measures (Content creator interviews, 2018). This leads, according to the interviewees, to the need for making the benefits in adopting such measures explicit. The expected benefits, while not fully observable until enough content has been restructured using the proposed standardization system, has comparable precedents in the academic area. Meuter et al’s study on content standardization applied to academic curricula (2009) was chosen for its uncanny resemblances to this project. His study had easier to measure outcomes due to, amongst others, the fact that students were assessed after the courses with standardized tests, which could clearly link measurable results to the implemented standardization processes. The increase of consistency in student’s learning outcomes (Meuter et al, 2009) has led to the increase of academic results, regardless of student’s prior academic abilities (Meuter et al, 2009). Making a parallel to this project, it can therefore also be expected that standardized content will be beneficial, despite the diverse d-shop audience. The main challenge in the implementation and maintenance of a standardization system in d-shop’s workshop content portfolio, which is perceived by content creators as being concept adoption, has the potential of being reduced over time as d-shop collaborators get accustomed and see the benefit in the standardization system. In Meuter at al’s study, student acceptance of the standardization in academic courses concept grew after they had been exposed to these standardized courses. The

same is expected in d-shop, as benefits can only become clearer over time and in experiencing the proposed methodology.

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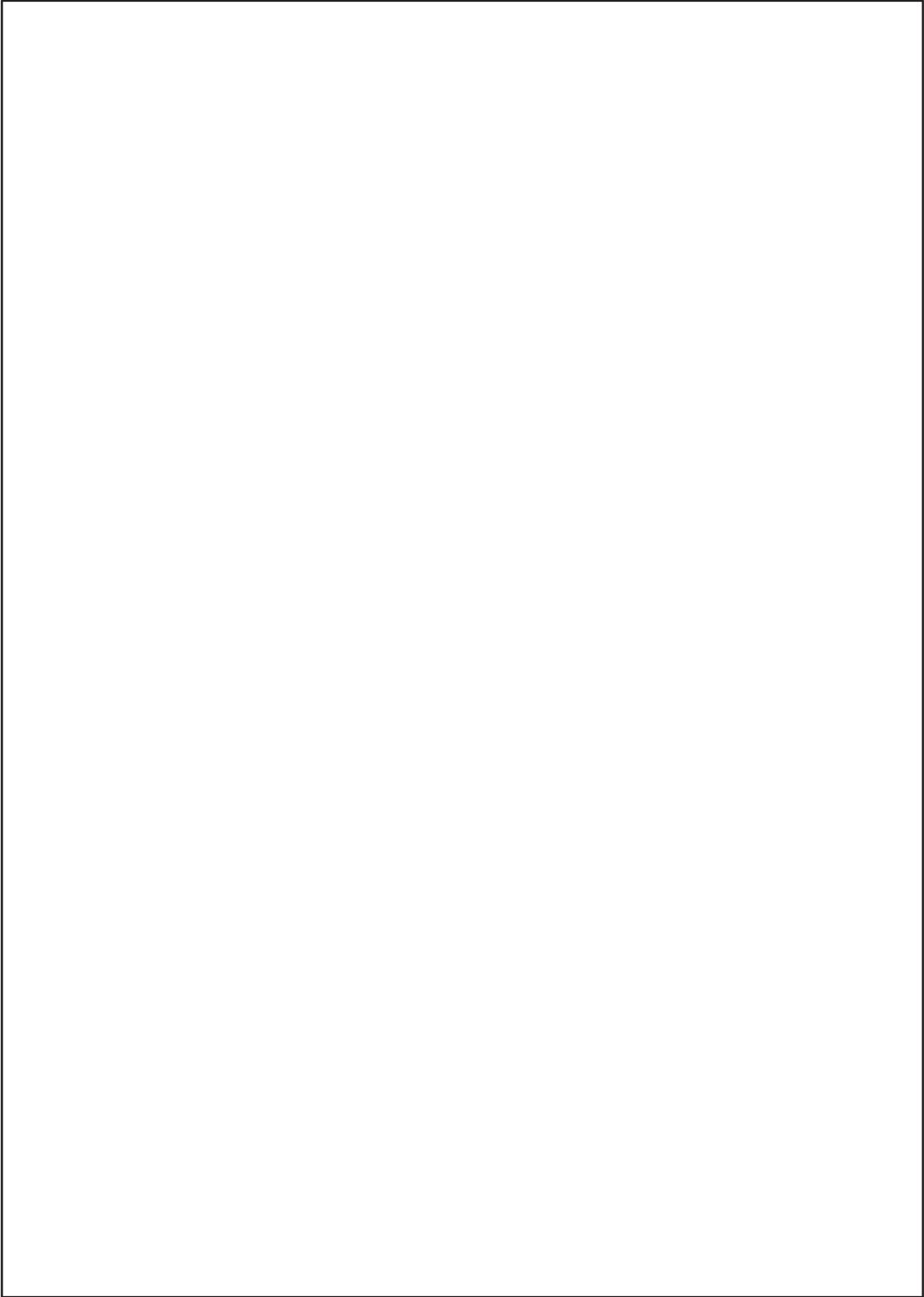
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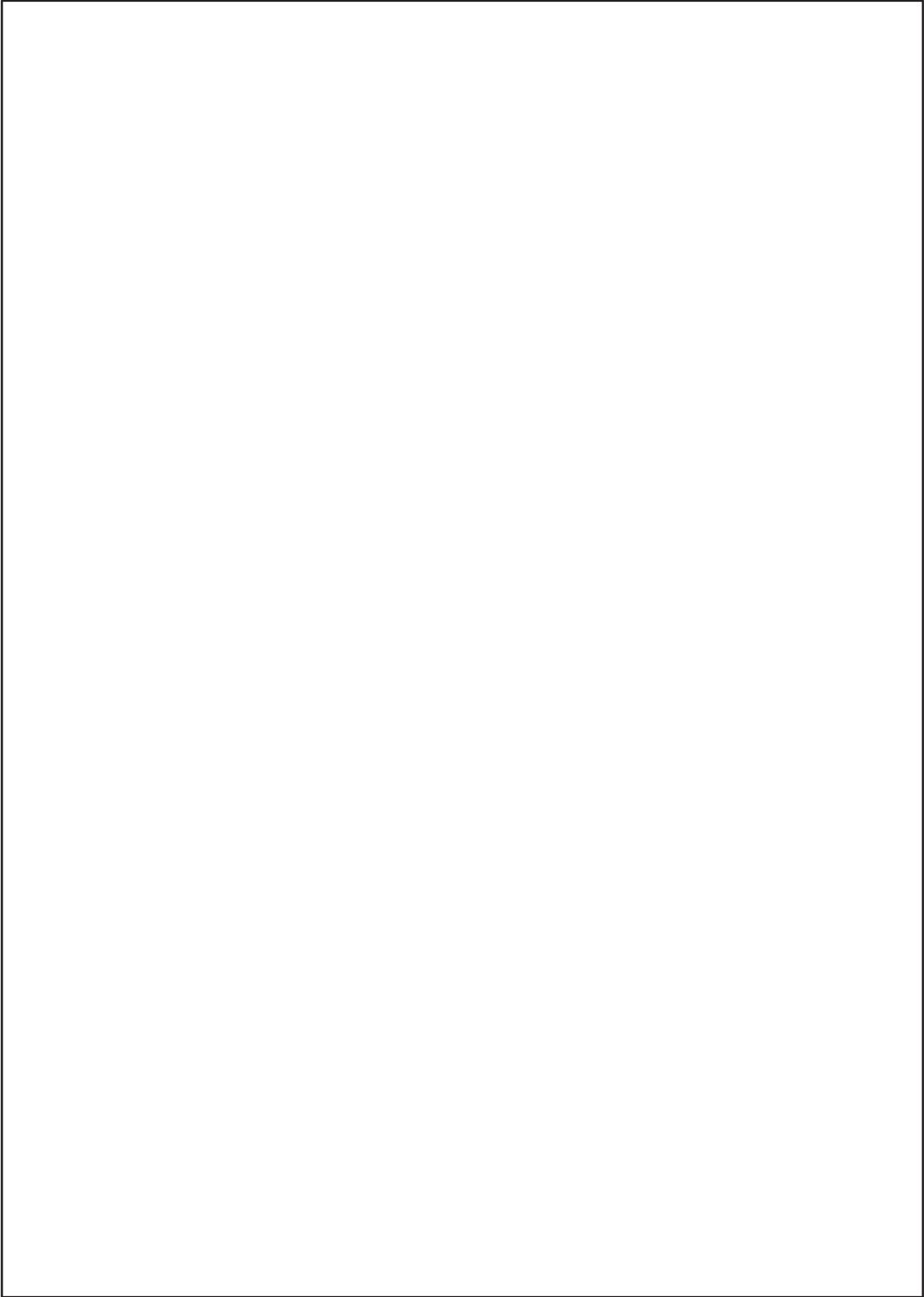
Appendices

1- Booklet

The d-shop book







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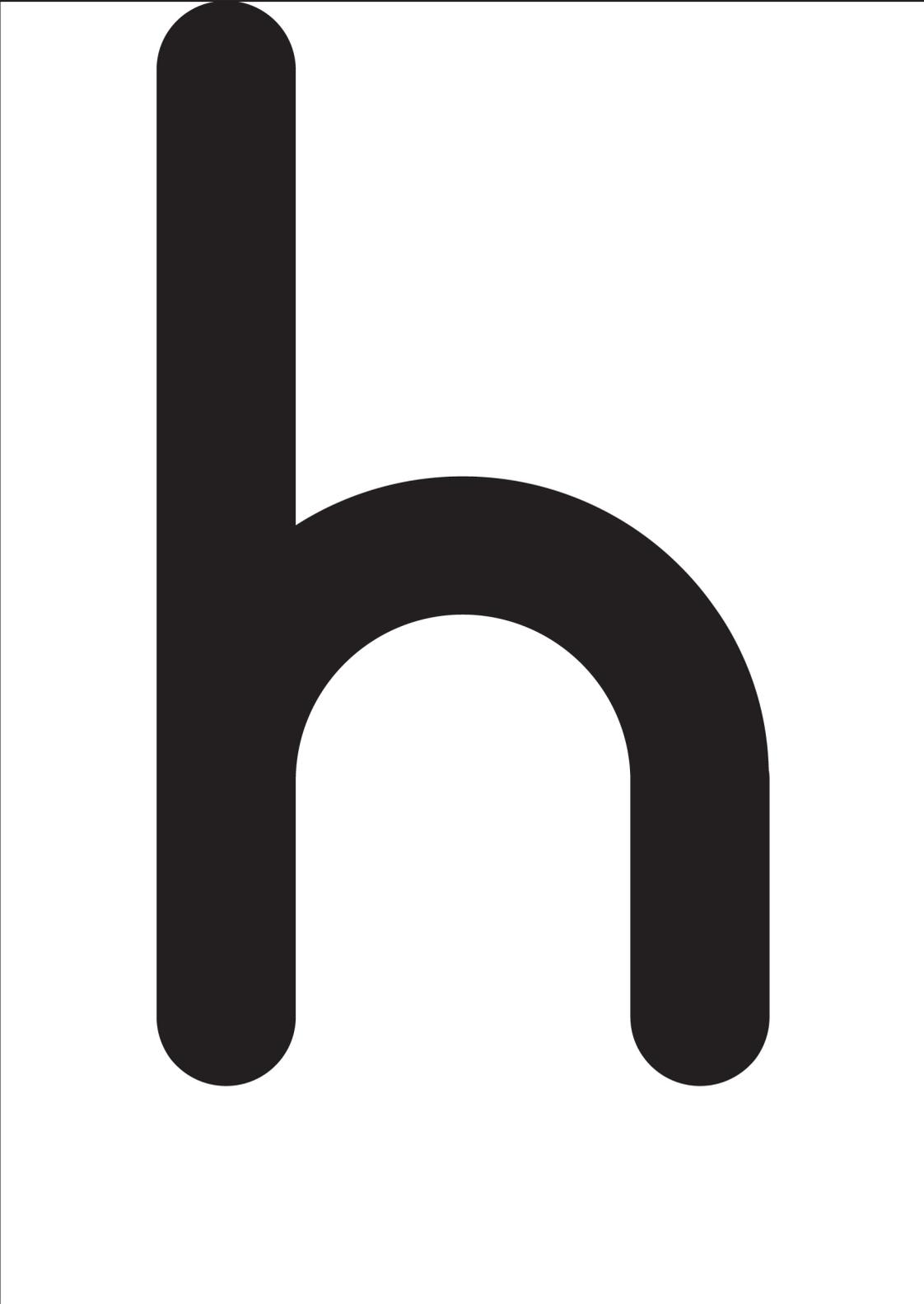
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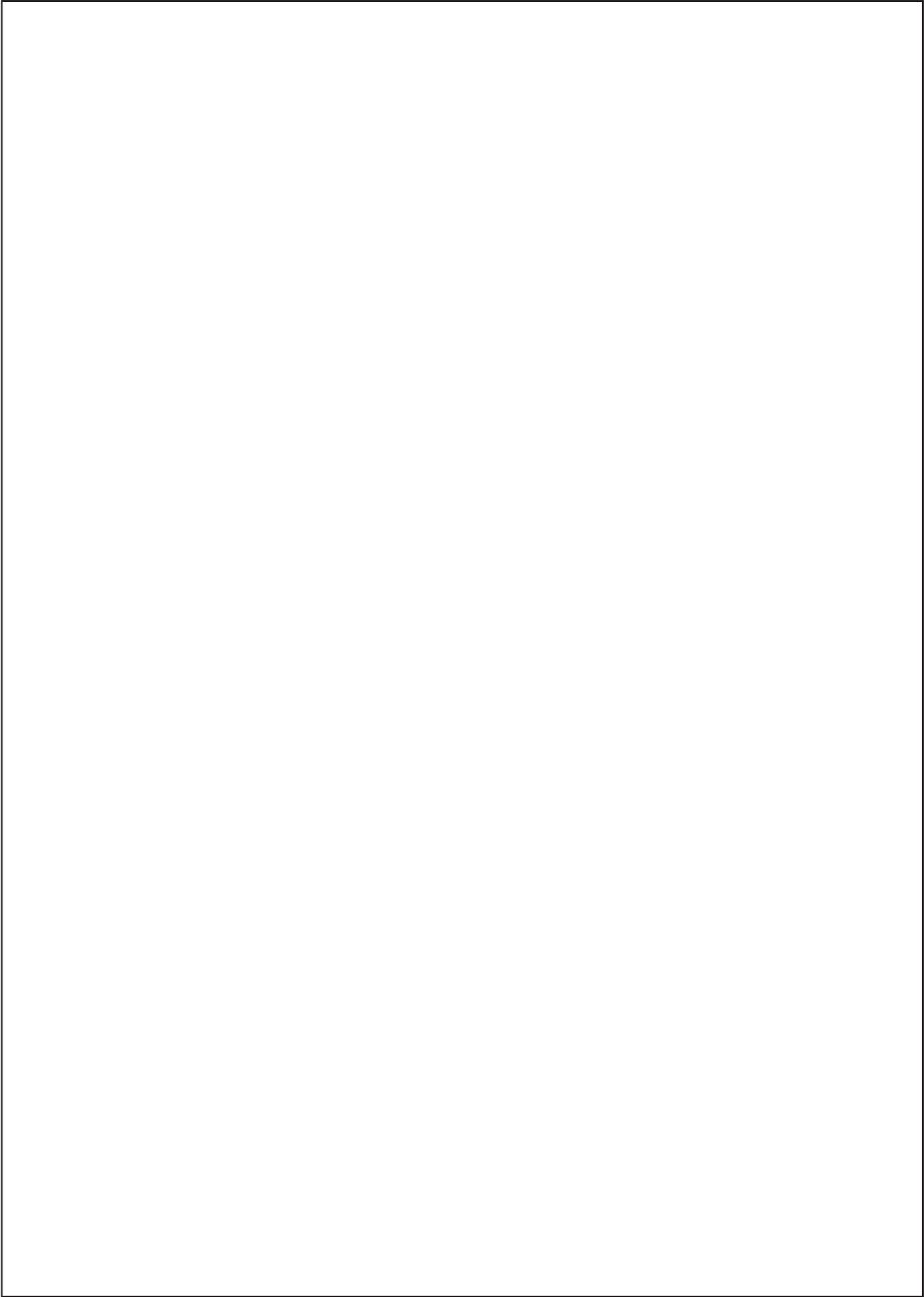


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Dear reader,

In this booklet, you will find valuable information about the d-shop. It is divided into chapters that can be individually consumed according to your needs. Irrespective of your experience with the d-shop, whether you're merely a curious observer, user, collaborator or member of the d-shop team, this booklet has something for everyone. The content assembled combines both theoretical and practical information. It can either be used to gain an insightful peek into the d-shop initiative, as a reference manual, or even as a starter guide for creating your own local d-shop.

We hope you enjoy reading this booklet.
Unleash your creative potential, and never stop learning!

The global d-shop team.



The creation of this booklet would not have been possible without the valuable input of many d-shop users, current and former d-shop leads, staff and volunteers, as well as a variety of experts working across diverse fields at SAP. **Thank you.**

d-Shop

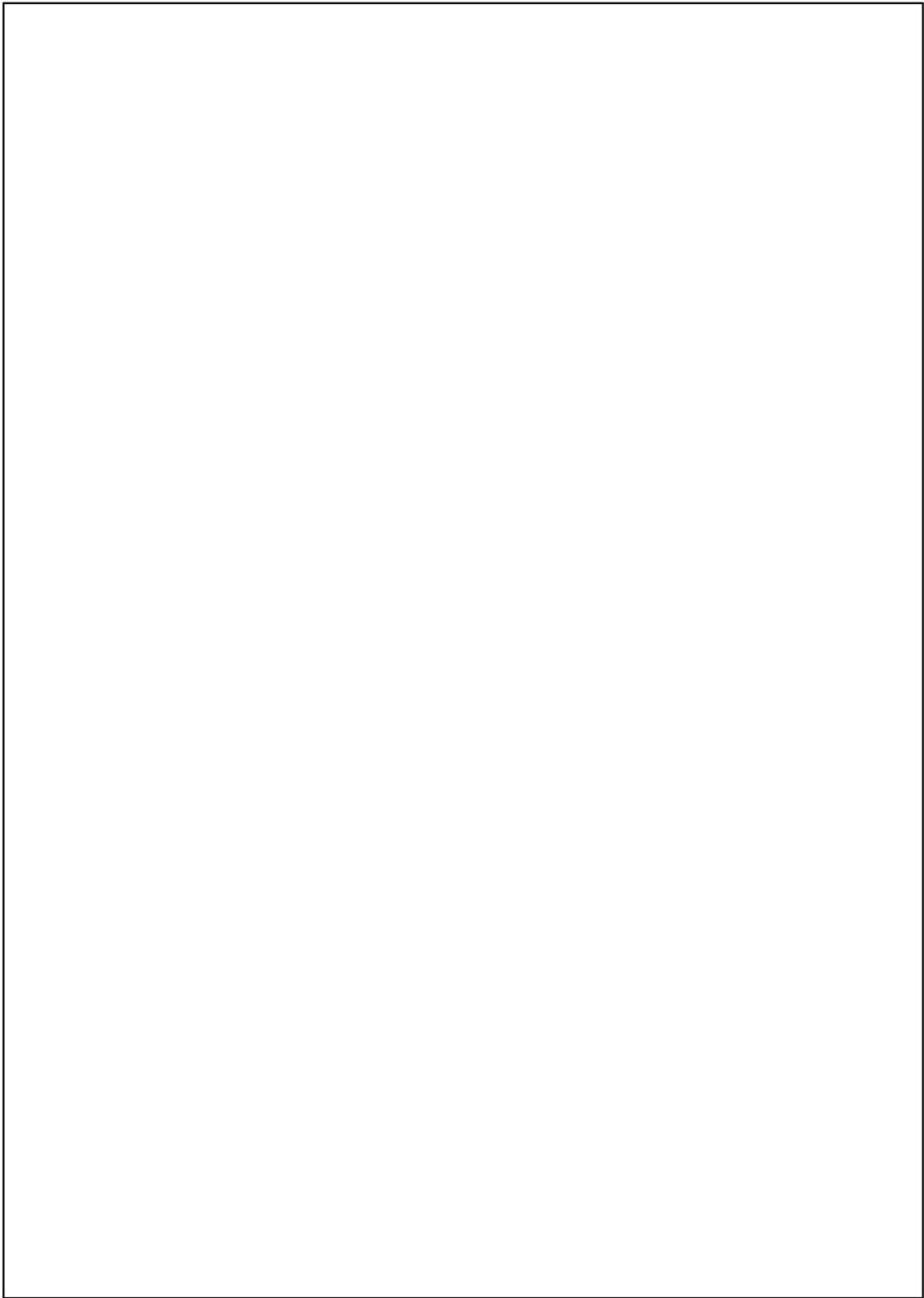
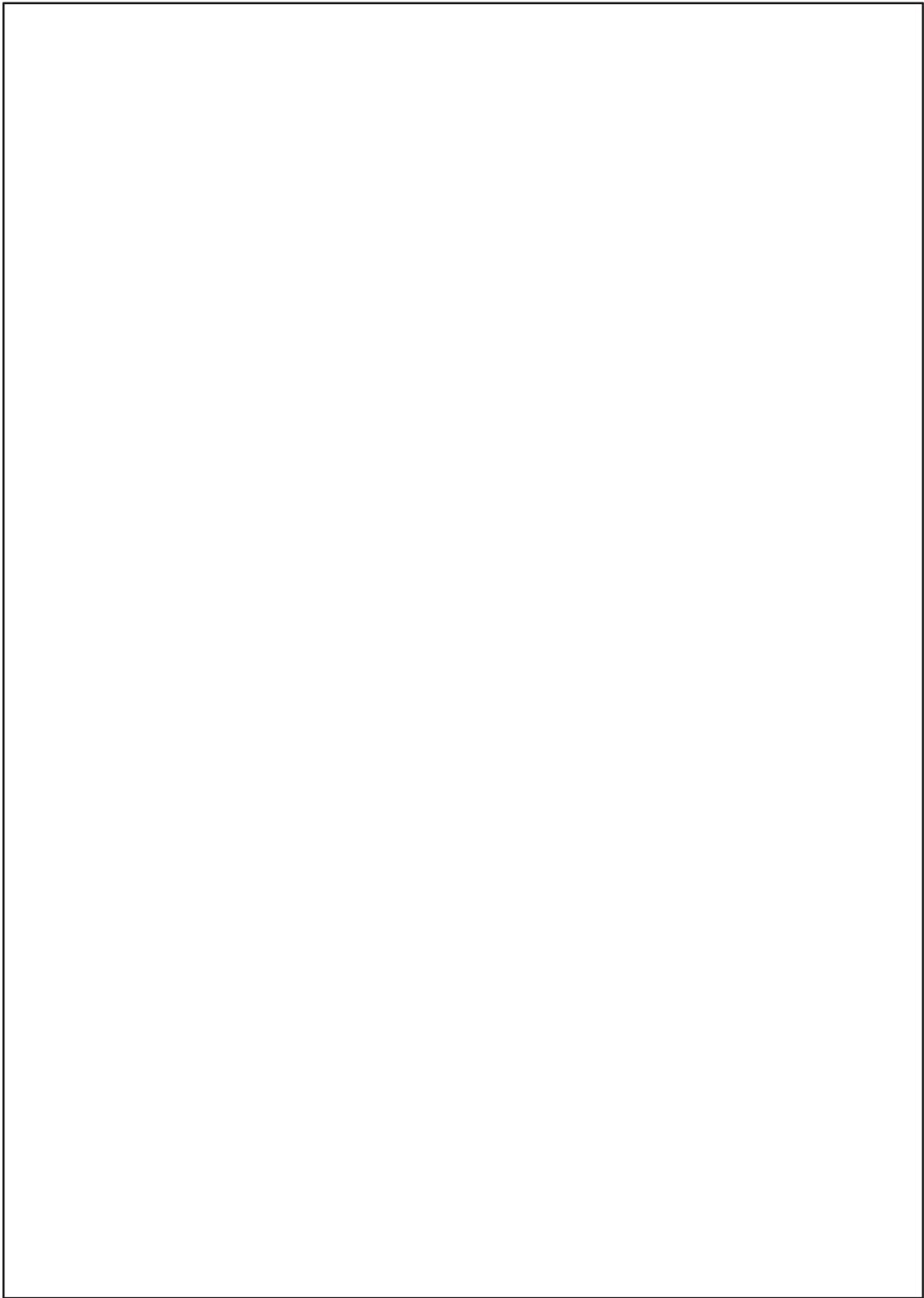


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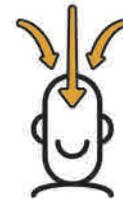
What is the d-shop?

The d-shop is a versatile space which offers users a variety of different possibilities for interaction. The main ones are:

Participatory engagement

Learning space

It is aimed at introducing users to external technologies through workshops, contextualizing these to SAP and eventually going further in certain topics, in different levels of depth.



Workspace

The d-shop has tools and materials which are sometimes difficult to access as an individual. These can be freely used by employees in the development of projects.



Events with SAP customers/partners

On occasion, the d-shop has also provided learning sessions and workshops which have included SAP customers and partners.

Spectator engagement

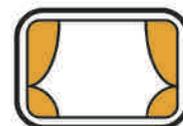
Demo space

The d-shop is open for any employee to see, test, and discuss the available technologies and hardware.



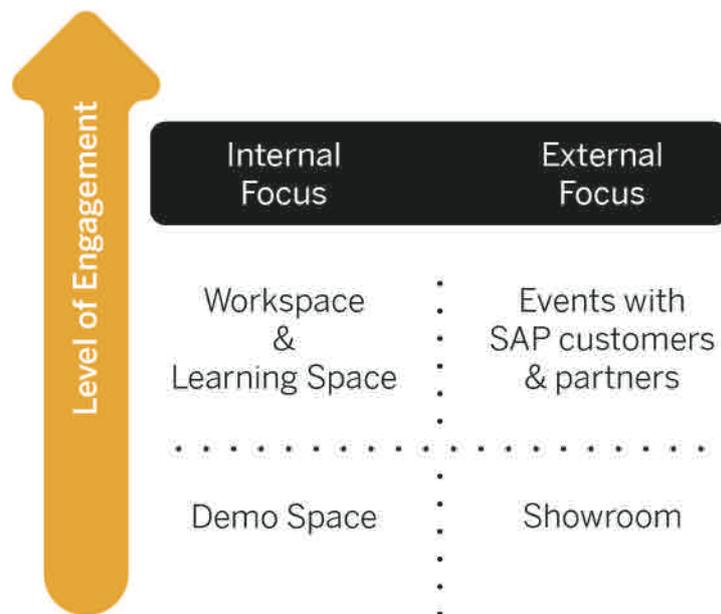
Showroom

The d-shop is interesting to external parties. It shows that SAP is open to fostering innovation, and is attentive to new technology and their effects on its business. Eventually, the d-shop might also go to events and represent itself, as well as SAP.



What is the d-shop?

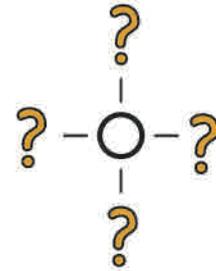
In the multiplicity of roles d-shop has, the majority of the most prevalent activities are internally offered, and there is a big focus on active and participatory engagement. Within it, there is a push towards tangible experiences and practice-based learning.



The d-shop's use as an internal learning place is in most cases its strongest offering (though this may vary according to local needs/demands). In this scenario, where there is already a saturated market of technology courses (mostly online), it is important to understand d-shop's unique value propositions. These are: context, convenience and network.

Context

The d-shop is a part of SAP and therefore has the unique opportunity to present external technologies under the light of their relationship to this company. Presenting this content internally at SAP labs provides added value which can't be found elsewhere.



Convenience

Users don't have to do any extensive search for content, as the d-shop offers a clear and curated selection of content and, in addition to this, a support network for the users. Presenting clear paths facilitates user's exploration. The geographical proximity to users (in locations which have physical d-shops) and the direct access to material contributes to this convenience.



Network

When interacting with the d-shop, users engage a community of experts, enthusiasts and at the very least curious people. By doing so, they are



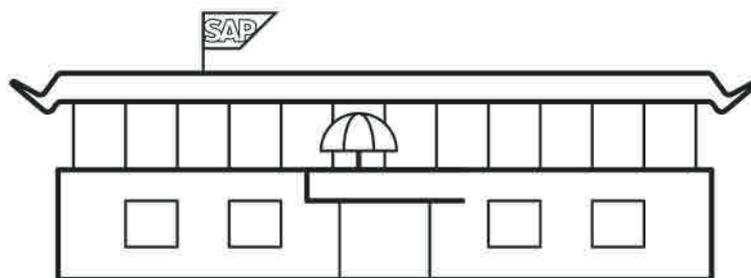
What is the d-shop?

able to directly access this network for support, feedback, discussion, etc. While this is also achievable in other technology learning platforms, in the d-shop it is possible to do that at a much easier and personal level, being that users and d-shop volunteers /staff alike are part of the same company.

What is d-shop's history?

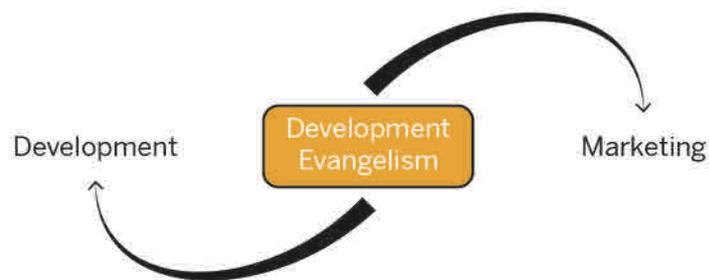
The initiative which inspired d-shop's creation was started in the Palo Alto SAP office, as an outreach program focused on developers evangelism. The idea was to make SAP's software easier to test and communicate externally, assimilating from the concept of trial versions propagated by other types of software companies.

Through external interactions, e.g. hackathons, value was also brought into SAP, rather than only driven outwards. Learning about the propagation of Makerspaces (and similar initiatives) in the Bay Area from these external contacts, this outreach program's team had their interest successfully sparked on the subject. With some leftover budget, the first 3D printer and other maker technologies were purchased as a result of this shared interest, but at that given time the team was too busy to make use of them.



What is d-shop's history?

Inside a company context, development evangelism can either be tied to the development area or the marketing area. In SAP, it was initially tied to development, but at certain point in time the decision was made to shift those efforts to the marketing sector. This transference of responsibilities resulted in the original team of evangelists seeing themselves in a position of increased liberty, time availability and reduced responsibilities.



The unique opportunity of starting something from scratch led to the insight of taking a 180 degrees turn: the originally external focus would be substituted for internal development of SAP employees. The CEO of TechShop (chain of membership-based makerspaces) was invited for a talk, as an external source of inspiration for the team. This provided a more tangible view of how open and collaborative spaces operate, which then finally led to the birth of the d-shop concept. The first d-shop was opened in Palo Alto, in late 2013.

The Maker movement

Amongst the precursors of makerspaces (also known as “fab labs”) was Professor Neil Gershenfeld's 1998 class on “How to Make (Almost) Anything”, at MIT. One of the most interesting observations made by Gershenfeld was the class' dynamics: learning was driven by demand rather than supply of knowledge, and peer-to-peer discussions were also a fundamental part of the class' collective learning experience. This eventually led to the bottom-up collaborative approach adopted by d-shop.



“Making is actually not about DIY, but rather all about DIT, or Do-It-Together” - Lang, David.

The d-shop name

The d-shop started as part of the Development Culture team, which was behind a number of initiatives that carried the “d-” prefix. From a branding perspective, it made sense to maintain this style when naming d-shop. It is short for “developer's workshop”.

d-Shop

What is d-shop's history?

The first step in getting the d-shop started was assembling the idle 3D printer, and rearranging a space in an open office as the first physical d-shop location. As the space and material started attracting more people, it was decided to establish structured workshops. More material was purchased (including hardware only available B2B at the time), more people were attracted, frequent talks were organized, and that's how the d-shop started growing and evolving into what it is today.

Though some aspects of the initiative may have also evolved along the way, d-shop's main mission of internal enablement remains the same: Bringing new technologies closer to all SAP employees. The way this is done is mostly by the removal of barriers standing in between SAP employees and new technology. These obstacles might be:



Too many options: the d-shop curates technologies which are relevant, exciting and easy to work with.



Cost/availability: the hardware purchased by the d-shop is made freely available to its users.

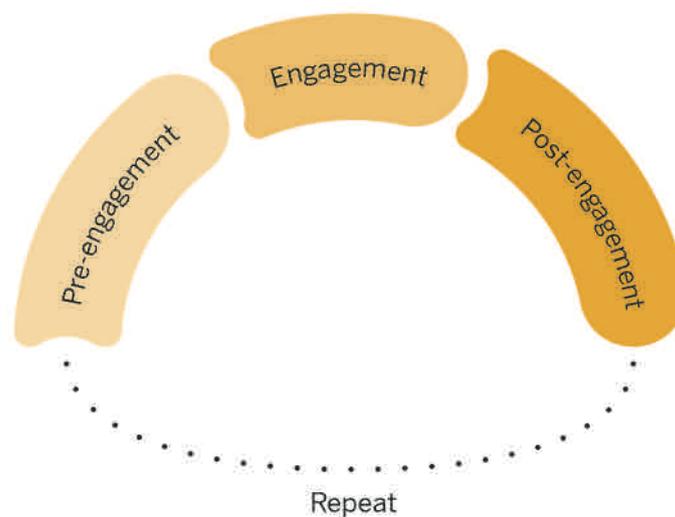


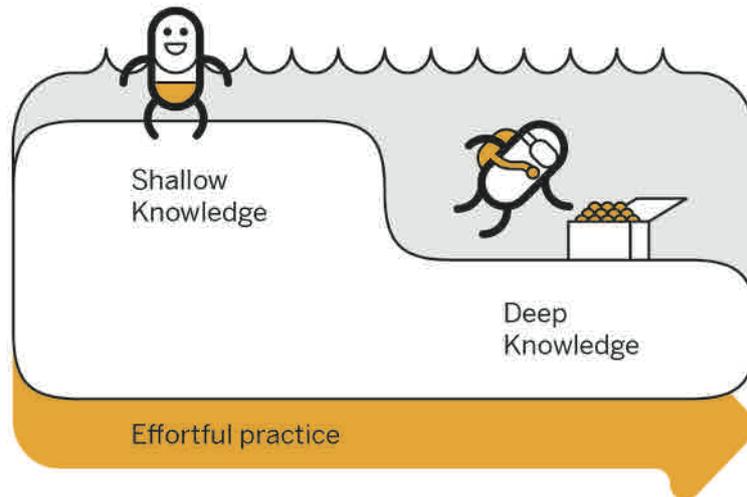
Starting effort: the d-shop team knows enough about the provided technologies to assist users in getting started on them.

What is the user's journey at the d-shop?

Like in any other type of interaction between a user and a service system, the user journey with the d-shop can be roughly divided in three areas: pre-engagement, engagement, and post-engagement.

There are users who might have a specific target when interacting with the d-shop, and might wish to have a finite experience. While these users have to be given the opportunity to "close the door" if that is their wish, the d-shop should provide all the means necessary for continuous user engagement.





Tip

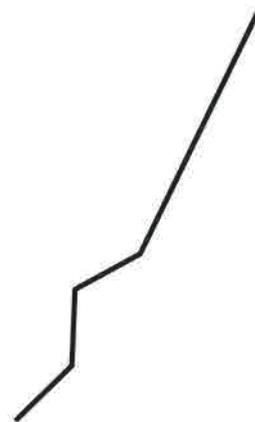
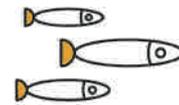
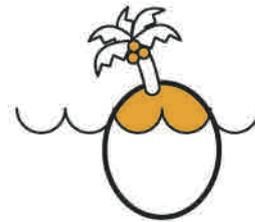
Users who are seeking deep knowledge in a specific area can be “recruited” to assist others in that area, as part of an ever-growing d-shop community, and honoring its “bottom-up” approach to learning. Make sure to keep an eye open to recognizing “expert” users at the d-shop.



Who are the Users?

One of these groups is seeking shallow knowledge: exposure and simple understanding of relevant and up-to-date technology. In addition to pure curiosity, the d-shop users are part of a software company, so they don't want to feel "excluded from the conversation" at SAP, regardless of their background. They are also interested in learning how upcoming technology may affect their lives and work.

Deep knowledge adds practice and profound understanding to the equation. Deep knowledge requires effortful practice to be developed. Effortful practice usually consists in individual and focused activity, being further removed from d-shop's core goal of providing a starting platform in the technology world. Considering that, in general, the most successful d-shop front has been its use as a learning space (workshops provide mostly shallow knowledge), users who want to advance further in any topic are welcome to use d-shop's facilities as an internal workspace, having access to assistance when needed on a case-to-case basis.



and an environment of non-stop activity: wants to see movement, color, sounds, etc.

Some of the aspects mentioned by users in their vision of an ideal d-shop experience may go beyond d-shop's reach, such as spatial constraints, hardware and staffing desires. It is, thus, important to understand user's ambitions in order to translate them into actionable transformation. The solution to a desire for a bigger space, for example, might be resolved by rearranging furniture, reducing class size, etc., rather than having to move into a different location. Be attentive to local user's wishes, as they may greatly vary.

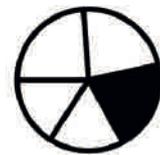
Engagement depth

There is almost a perfect divide regarding the depth users are willing to go as far as learning at the d-shop goes.

what they do, when they can be borrowed, etc.

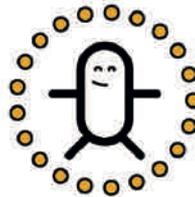
The Outgoing

Wants an “oasis at work”, where they can meet people with similar interests, collaborate and innovate. They also want to network with people with diverse expertises.



The Spacious One

Wants individual desks in a bigger space, resembling a lounge/classroom combination for facilitated learning and networking. Wants a better space both in terms of location as well as interior, being more like fully-fledged maker-spaces.



The Gadget Freak

Wants access to all the new technologies, an overwhelming amount of possibilities

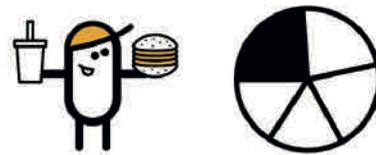


extrinsic-related responses when comparing to the motivation results. Still, those corresponded to only a fifth of the total responses.

Ideal d-shop Experience

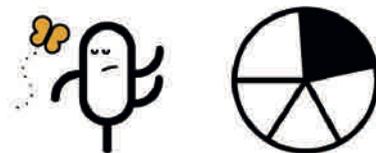
The Super-Sized

Wants more content diversity, more time availability and more difficulty levels. Not only do they want more quantity, but also that this content is further connected to SAP's reality, that there is intersectionality amongst technologies presented, and between them and real projects.



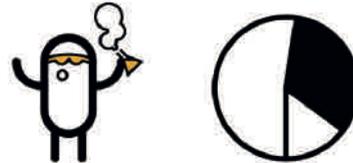
The Flexible

Wants d-shop to always be staffed and open for visiting, easier access to hardware and facilities, better ways to locate devices, know what they are,



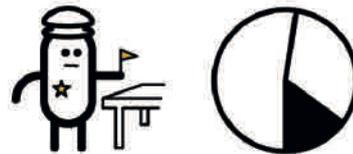
The Inventor

Creates practical value from d-shop's resources. Uses available support, input, material, content, etc., for advancing own creations or projects.



The Strategic

Their goal is applied knowledge. They use knowledge gathered at the d-shop for work-related projects at SAP, advancing their professional lives or even further sharing content in their own circles.



Motivating factors can be roughly divided in two categories: intrinsic (originated from the engagement with d-shop itself, such as learning and working on projects) and extrinsic (originated from expected outcomes of engagement, such as the possibility to apply the knowledge gathered elsewhere). The majority of motivating factors mentioned by users are intrinsic by nature (e.g. general knowledge and practical value).

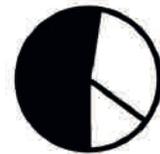
When asked about expected outcomes of engaging the d-shop, though, there was a 50% increase in

Attendance rates are not supposed to be directly translated into success or failure. As seen further on, not all users have the interest in continuous/in-depth learning; some of them have a specific target and want to be able to “close the door” once their needs have been addressed. What is important, though, is for them to know where this “door” is, and feel welcomed to reopen it at any given time.

Motivating Factors

The Erudit

Likes to expand their general knowledge, with the intent of being up-to-date and not feel excluded from conversations in a diversity of topics. They also like to feel empowered to further their learning experience.



Who are the Users?

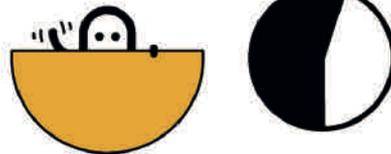
designers, managers,
salespeople, etc.

Two thirds of the d-shop users are from development-related areas, which doesn't come as a surprise in a software company. It is important, though, to not forget that 1/3 is a large percentage of users, who are expecting information to be shared in a way they can comprehend.

Attendance Rate

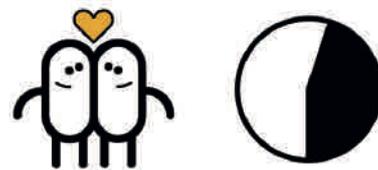
The Eventual

Attends the d-shop a few times a year.



The Repeated Card

Engages the d-shop at a monthly or weekly basis.

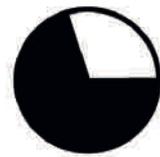


Who are the Users?

Professional Background:

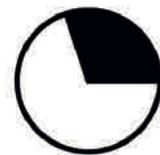
The Techie

The "Techie" is either a developer, someone in a development-related position, or even someone with technical background. They are already practiced and somewhat equipped to face many of the challenges the d-shop provides.

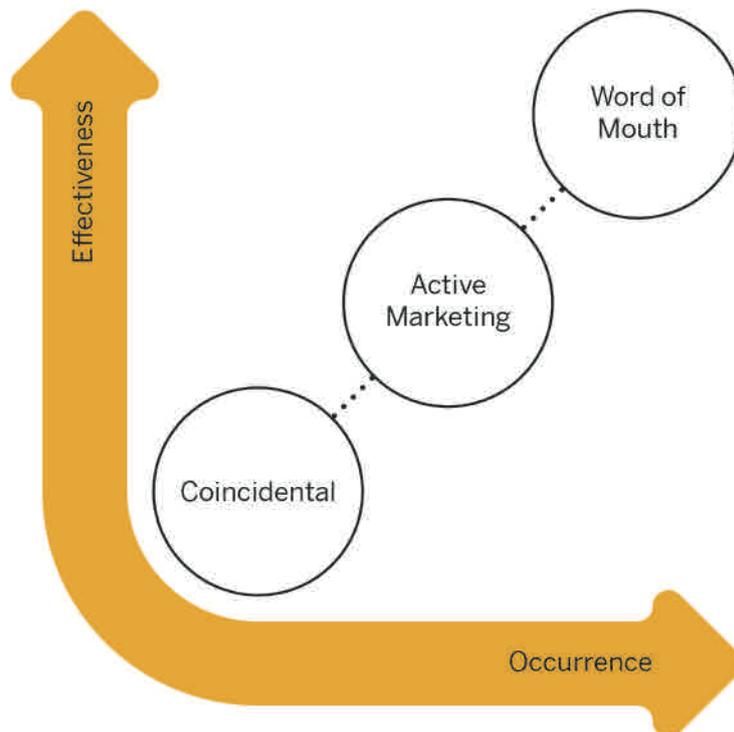


The Explorer

Departing from the comforting familiarity of their professional/academic areas, they are in a journey of exploration. These may be students in the most diverse areas,



How do users discover d-shop?



Ideally, after a first comprehensive and focused active marketing effort from the d-shop, marketing should become a nearly self-sustaining system, with users voluntarily promoting the d-shop to others (9 out of 10 d-shop users promote it to colleagues). Some minimal marketing maintenance at this point is always positive, though, via e.g. newsletters.

accidental discovery of the d-shop, such as “stumbling” into the d-shop room. Having a high visibility placement inside SAP should not be used as argument to reduce efforts in other types of marketing. Even when having a “prime spot”, the d-shop should make an effort to communicate its existence and purpose to its users. If your d-shop location is in a “prime spot”, though, make sure to use this in your favor, clearly displaying information about the d-shop initiative to the passerby.

The ratio between these different types of user discovery depends on many local factors, so it's up to the local d-shop lead to identify the best combination of approaches for bringing visibility to the d-shop.

How do users discover d-shop?

Active d-shop marketing

The starting point for any new d-shop is getting the word out and inviting people over (this can be done via internal newsletters, email lists, posters, demos in areas of internal traffic, etc.).



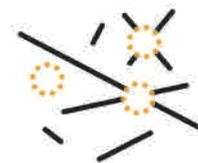
Word-of-mouth

The starting point for any new d-shop is getting the word out and inviting people over (this can be done via internal newsletters, email lists, posters, demos in areas of internal traffic, etc.).



Coincidental

This is the least reported means of discovering the d-shop, and refers to

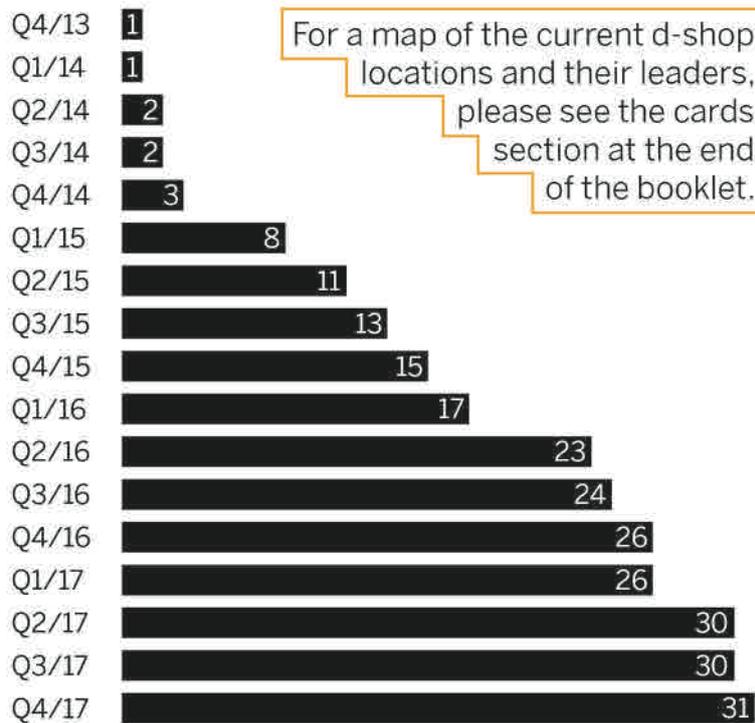






Where can I find d-shop?

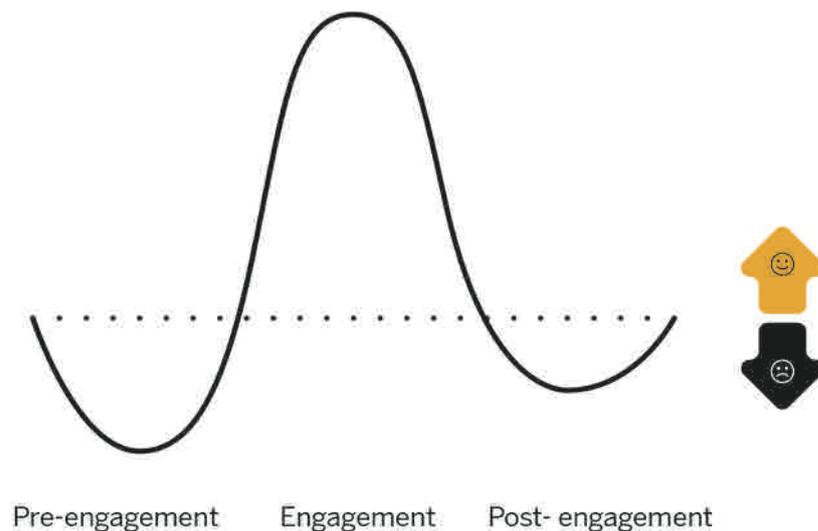
An ever-expanding initiative, the d-shop can be found in 18 countries and 30+ locations, as of 2018. We expect these figures to steadily increase, so that most SAP employees have access to a d-shop. Follow the d-shop's growth below:



What is the user's journey at the d-shop?

User research has indicated the d-shop's main strength is in content delivery, support, demos, networking platform, etc. (i.e. the engagement area). The main weaknesses were the lack of d-shop visibility and call-to-action, clarity of purpose, registration process, etc (i.e. pre-engagement); and also the slim interaction with users, lack of follow-ups or content continuation, etc. (i.e. post-engagement).

This can easily be seen in the image below, which shows the overall user experience during their journeys with the d-shop (values were obtained by averaging the number of positive vs. negative remarks in user's reported experiences at each area of their journey with the d-shop).



What is the user's journey at the d-shop?

Users sometimes just don't feel confident enough to take the first step in interacting with the d-shop. Sometimes, after effectively engaging the d-shop, some users feel "thrown" back into reality and lost as to how they could continue their learning path, should they wish to do so. Considering the d-shop as a holistic service and not only as a punctual interaction is crucial for its success. Pre and post-engagement play an important role in the way d-shop is perceived by its users.

It is therefore important to strengthen these two extremities, in aiming for a more balanced overall experience and in creating a sense of either continuity or proper closure, depending on the user's desires. It is evident that not all issues might fall under the d-shop's intervention power, and that each different location has their own particularities, so it is important to understand what issues your own d-shop faces and what is your potential area of action. Some issues, which have a primary solution that clearly lies outside d-shop's scope of power, might be lessened or even mitigated through creative alternatives and work-arounds.

Makers do not shy away from a challenge, and work with what they have at hand!



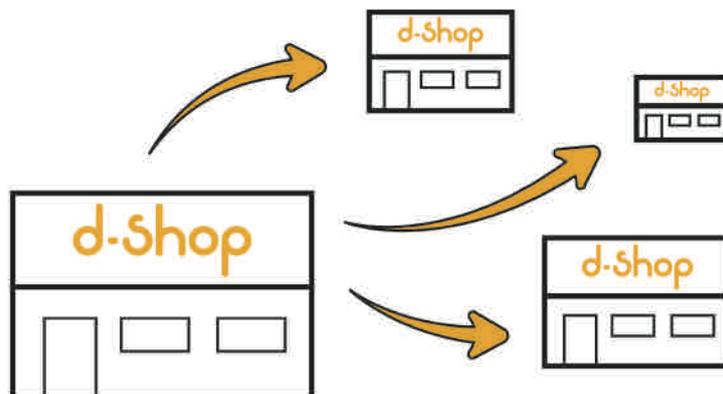




How is content developed?

One of the global d-shop team's tasks is promoting a general and unified d-shop concept. While local d-shops are a fruit of the hard work of local volunteers, who are encouraged to have their own views and control of their respective locations, the d-shop is still a global initiative, and as such is widely accessible to all employees.

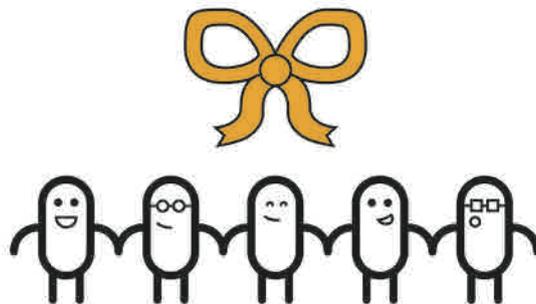
Beyond merely branding, the implementation of a few standards in content development promotes cohesion and a quality level standard to the initiative as a whole. These practices also improve the transferability of material and knowledge between locations, so that more people can benefit from created content.



How is content developed?

In addition to benefiting the initiative itself, having a consistent standard of quality also benefits the users. Last but not least, having a framework which facilitates content creation could improve collaborator's willingness to share their expertise.

As content creation is a collaborative endeavor of many different d-shop collaborators, each of them has their own idea of how a workshop should look and feel, which leads to great variance in d-shop's content portfolio. Not only can this detract from user experience if their expectations are not met, but it also hinders the establishment of a true d-shop brand identity in terms of content and delivery.



For this very reason, as well as to facilitate content creation by collaborators, a three-step process in content creation was developed:

1

Insight

In this **booklet**, you find useful information on the d-shop and its users, their expectations, and wishes. Understanding the context and your audience is a great place to start when considering the development of workshop content.



2

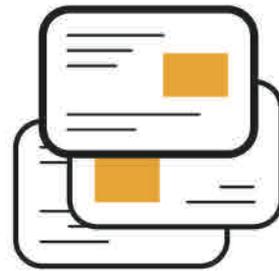
Decision

After better understanding the context and audience for the workshop to be developed, it is important to take a step back and reassess your original workshop idea, using the insights from the previous step as a lense through which to reexamine previous assumptions. A few positioning questions will guide the collaborator in this process (this **decision-making tool** can be found in the “cards” section, at the end of this booklet).



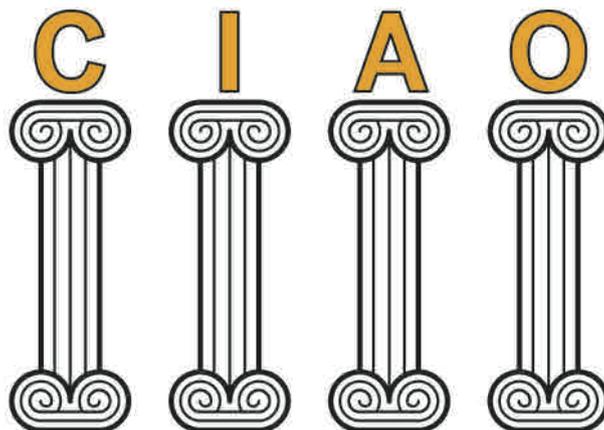
3 Action

This is where the actual development of the workshop starts. Assisted by the two previous steps, the content creator may then use the fillable **workshop content templates** as a means for streamlining the content creation process, while ensuring homogeneity of the workshop with the rest of d-shop's content portfolio.



What language does the d-shop speak?

As explained in the previous section, the diversity of sources in d-shop workshops leads to the difficulty in grasping a unified d-shop identity. Not only does this apply to the content and delivery styles, but also to writing. In dealing with this issue, a great tool to have is a common guideline for tone. Luckily, SAP's brand tone matches d-shop's identity fairly well. Its main pillars are: clarity, insightfulness, approachability and optimism. These four pillars are presented as ingredients, rather than fixed values, which may vary accordingly to its use-case.



Clarity

Clarity means using a simple and comprehensible language, breaking-down technical complexity and avoiding jargons. In keeping the d-shop an inclusive place where all SAP employees feel welcome regardless of background, it is crucial that the language used is clear to all (especially when content is not presented in the majority of user's native language). Short sentences and paragraphs highlighting main concepts also facilitate understanding, and using the active voice reduces the content's similarity to a technical document.



In order to start the print, Cura must be used in slicing the generated .stl file, in such way that negative angles and surfaces which might require support are avoided.

In order to start the print, we have to open Cura (the 3D printing software previously downloaded), upload the saved .stl file, and slice it. Slicing prepares the object for print, as the 3D printer prints any object in "slices". Any "floating" (unsupported) surfaces should be avoided, as they will require additional support structures to be printed.



Approachability

Fairly related to clarity, it proposes the use of conversational language and tone, aiming at a feeling of inclusion. This can also be promoted by the use of the pronoun "we" in text's action points. Using real-life examples and analogies increases approachability, as well as being an effective way to promote retention of abstract concepts. Using an approachable tone increases the likeability of d-shop.

For convolutional neural networks, the features are calculated by performing a mathematical convolution between the kernel and the input, resulting in a feature map that represents the match of the kernel with the corresponding image section.



Convolutional neural networks behave like a mask. First we must apply the filters to the original object in search of matching elements. Then we calculate the rate of matching positions.



Insightfulness

Insightful means knowledgeable, helpful, and enthusiastic. Do not only present the small pieces in the puzzle, but also give a general perception of the big-picture behind concepts.



When you line-up a potentiometer to the setup instead of a switch, you can then control the intensity of the LED lamp, to shine either brighter or dimmer.

Most LED lamps are not dimmable. How does their brightness changes then, you might wonder? When connected in line with a switch button, LEDs have two stages: on or off. When connected in line with a potentiometer, though, the frequency in which the LED is turned on and off can be controlled. The blinking (which is too fast for the eye to perceive) gives the impression that the LED is dimming.



Optimism

The d-shop is a place of experimentation, where mistakes are a desirable part of the learning routine. As cliché as it is, this is a scenario in which “the journey is more important than the result”. That being the case, while being a desirable mindset on itself, optimism is not necessarily one of the most important elements in d-shop’s brand voice. Avoid giving the false impression that everything works perfectly, anticipate mistakes and provide troubleshooting (thus promoting a helpful tone instead). Other characteristics related to optimism, on the other hand, perfectly match the desired d-shop tone of voice, such as adopting a passionate and inspirational tone.

After completing all the steps in the process, connection to the cloud is established. You will be able to see the automatic updating values which are being collected by the sensors.

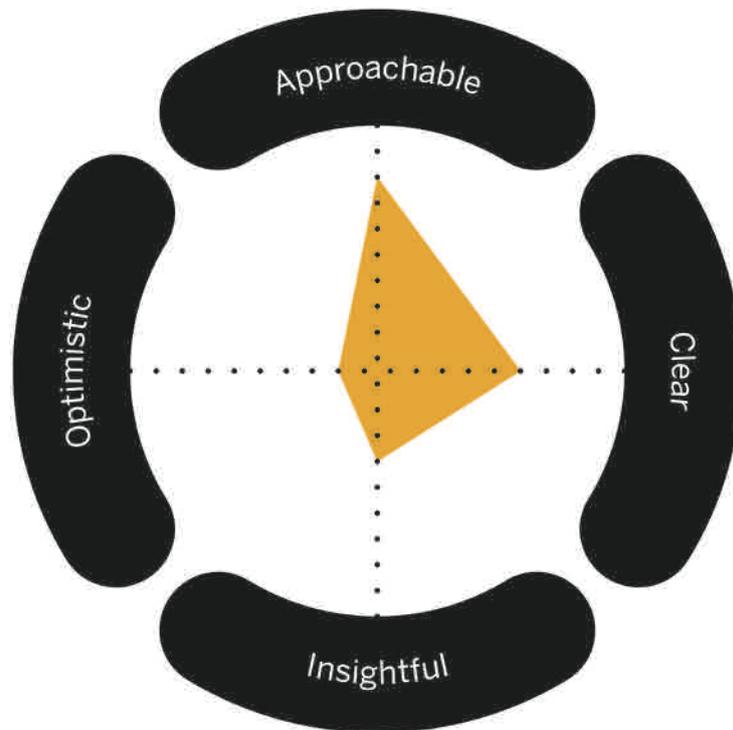


When the connection to the cloud is successfully established, you should be able to see the sensor values automatically update. If that is not the case, it may be that the connection is faulty. You can reset it by following the steps on the troubleshooting page.



What language does the d-shop speak?

The d-shop tone of voice should adopt the distribution of values presented in the following image as an approximate guide:



What does d-shop look like?

The importance of a consistent d-shop visual presentation lies mostly in the perceived connection between locations (especially in the adoption of a unified logo) and in facilitating content exchange/reuse (e.g. workshop documentation). While other aspects of visual communication are left to the creativity of the different d-shops, making them feel more “local”, some common inspiration can be used as a source of visual cohesion amongst locations (and between them and the unified material templates).

Two of the main aspects which define the d-shop are technology and hands-on/maker processes. A variety of elements from these two areas may be used as inspiration in personalizing your local d-shop's visual.



What does d-shop look like?

The following collection of images show a few examples of elements which inspired the visual language of this booklet and the fillable workshop templates (see cards section for link to them).

In these documents, SAP gold and black colors were used as the main color scheme. In addition to visually connecting the d-shop initiative to the context of SAP, the use of the yellow and black (widely applied in industrial contexts, in tools and signage) is very advantageous, as it demands attention due to the stark contrast.



From left to right, top to bottom:

- commons.wikimedia.org/wiki/File:Metasonix_D1000_Drum_Machine.jpg
- pxhere.com/en/photo/291456
- www.flickr.com/photos/appelogen/5179264587
- www.flickr.com/photos/70251312@N00/13067363803
- upload.wikimedia.org/wikipedia/en/f/fa/Color-halftone-demo.png
- commons.wikimedia.org/wiki/File:Dedication_ceremonies_lda_b_wells_homes_-_parade_along_south_parkway_-_chicago_housing_authority_LCCN98509947.jpg
- [commons.wikimedia.org/wiki/File:W.P.A._Federal_Music_Project_of_New_York_City_\(presents\)_two_chamber_operas_%22The_romance_of_robot%22_\(and\)_%22La_serva_padrona%22_LCCN98514982.jpg](https://commons.wikimedia.org/wiki/File:W.P.A._Federal_Music_Project_of_New_York_City_(presents)_two_chamber_operas_%22The_romance_of_robot%22_(and)_%22La_serva_padrona%22_LCCN98514982.jpg)
- https://commons.wikimedia.org/wiki/File:Dracula_by_Hamilton_Deane_%26_John_L_Balderston_1938.jpg





How can you contribute to the d-shop?

The following list is presented in increasing order of interaction & effort:

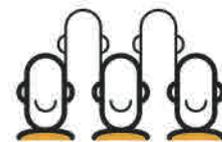
Promoting

Takes almost no effort, yet keeps d-shop awareness at a high level in the company. This increases the potential to attract new collaborators/participants to the initiative.



Participating

Active and recurring engagement with the d-shop's offerings is a great way of keeping the initiative "alive". Users also validate the existence of d-shop to higher management.



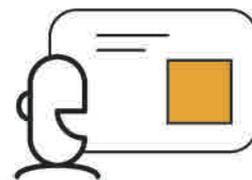
Creating content

d-shop's content is generated by users and to users, honoring its grassroots operation. If you have expertise in whichever of the subjects dealt with by the d-shop, you are welcome to contribute to its pool of knowledge. Content can be created in the form of blog posts, project presentations, workshops, etc. (be aware that creating workshop content and tutoring workshops might be interlinked tasks).



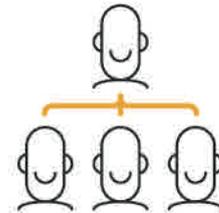
Tutoring

Often a part of the management task, presenting workshops and tutoring other employees is arguably the best way of becoming an expert in any given technology, while widening your network and providing value to others.



Managing

Most d-shops are volunteer-led. Managing a d-shop is not an easy task, but it can be a very gratifying one, allowing you to be on the forefront of new technology, and also getting the chance to be an evangelist in your SAP location.



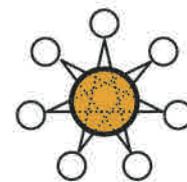
Further details in managing and tutoring activities can be seen in the “What are the d-shop’s best practices?” section.

What is d-shop's organizational structure?

There is a small group of people running the d-shop at a global scale full-time. They are responsible for the d-shops in Walldorf and Palo Alto. All remaining locations are run by teams of volunteers, who divide their time between regular work and the d-shop. They are the people who allow the d-shop to flourish. Each of these different actors has their own set of responsibilities:

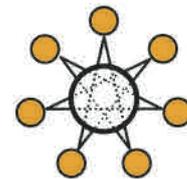
d-shop core team

- Sets d-shop's general vision, concept, and reports on the global program
- Coordinates the creation, ramp-up and ongoing activity of all d-shop locations
- Promotes best practices, learning material, projects, etc., across all d-shop locations
- Coordinates technology watch, proposes which technologies to investigate next



d-shop local teams

- Look after the d-shop physical space
- Purchase hardware and lend it to colleagues
- Schedule local workshops for enabling colleagues on new technologies
- Act as informal local advisors on new technologies
- Organize or facilitate local innovation events
- Provide tours of d-shop to externals (students, customers, partners, etc.)

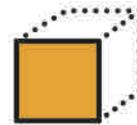


How do I start a d-shop?

Be sure to consider the following elements as a basic set of needs which must all be met for the success of a new d-shop, and to assure the existence of a committed core-team, which won't abandon the initiative once its novelty has ended.

A physical space

It is necessary for storing hardware, giving workshops, meeting externals, etc.



Local management support

For budget support, clearing off some time from a few colleagues' calendars for d-shop work, promoting and driving participation, etc.



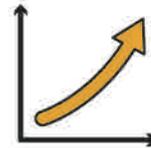
A core team

A few highly committed colleagues (around 3 to 7) who are willing to organize all d-shop's activities.



Demand

There needs to be local demand for technology learning, in a big enough scale to sustain a relevant (and regular) number of attendees.



Find a list of relevant contacts, including critical contacts for support and troubleshooting in setting a new d-shop location at the Cards' section at the end of this booklet.

What are the d-shop's best practices?

Building a d-shop

Finding enough people who are motivated by the d-shop ideals and excited to start the initiative locally is usually not an issue. The problems may arise once these people find out the reality behind maintaining a d-shop, which also involves a deal of logistics, maintenance and planning. Life events, business trips and workload fluctuations may arise in the lives of volunteers, and it is therefore key to have a robust team which is capable of withstanding a constantly changing environment.

One of the most crucial tasks is coordinating the d-shop team and performing "back office". This includes the less "glamorous" part of d-shop activity, such as scheduling workshops, purchasing and receiving hardware, advertising d-shop activities, answering emails and to questions in the Jam group, etc.

Locate volunteers

- Break-down tasks into smaller sections, which makes it easier to find volunteers who are willing to help.
- Foster a large pool of volunteers, regardless of how little or how much they can contribute.
- Be willing to accept the fact that volunteer's level of participation might fluctuate.



Get management support

- Convince local management (Managing Director of the Lab typically, or the managers of large local development teams) to free up some employee's time for looking after d-shop. This could even be part of their performance planning for the year. It is unsustainable for d-shop teams to only have contributors who volunteer "on top of everything else" with no support from management.



Capitalize d-shop's attractiveness

- The d-shop is a very attractive venue for interns and fellows. They can join



the team for a limited period of time, learn about new technologies and transfer their knowledge to other colleagues. In few months they could also be able to give tours, workshops, and present demos.

Creating value

Internal learning space

- Reuse learning material whenever possible
- Share documentation and knowledge between d-shop locations
- Keep documentation up-to-date
- Maintain records of workshops given and number of attendees
- Keep workshops short and around lunch time, so that users don't have to ask for management permission to participate
- Act as a community space and give voice to content which might be relevant to the d-shop audience
- Invite makers to present their projects to their colleagues



Internal workspace

- Hold regular “safety induction” sessions to colleagues who would like to use the d-shop at a more individual basis for their own projects. Provide them with a safety warning form, which they should agree to and sign. After that, they can become “d-shop members” and use the d-shop unattended.
- Be aware of local creative and maker-spaces, which might be leveraged in d-shop's benefit. Many arrangements can be discussed, for example the rental of more expensive machinery, as opposed to purchasing them.



Internal demo space

- One of the biggest challenges in this aspect is keeping up-to date with technology at a comprehensive enough level to conceive demos, present them and answer questions. Sharing information and existing demos with other d-shops is a great way to facilitate this process (the Jam group is available for this type of collaboration).
- Try to scale up demos whenever



possible, to make the best use of d-shop's time while reaching for the highest amount of people.

- Whenever possible, hold short demos at "public spaces" such as coffee corners, as a marketing strategy in raising awareness and interest on the d-shop.
- Holding open hours in a pre-established day and time is a great way to manage staff's time. During open hours, users are invited to visit, ask questions, request demos, etc. At any other time, incentivise users to come back during open hours.

External showroom

- Certify that software/hardware is "demo-ready" prior to presentations. Using a checklist of actions to ensure that is the best way to get this task done.
- Have a clear process for booking tours, and make it very visible to everyone, in order to avoid ad hoc tour requests. Make sure to include the contact person's details and information on how much advance notice is necessary for booking a tour.
- Keep a record of the amount of tours



given, how many people attended and who they were, in order to quantify d-shop's performance and value.

Running a d-shop

Documentation

- In addition to reusing content whenever possible, make sure to document everything, be that workshops or demos. Thorough documentation will facilitate the rotation of tasks between staff members, and even the eventual future additions to the team. Documentation might also provide assistance to upcoming d-shop locations, which might be willing to reuse this content themselves.
- Maintain an up-to-date FAQs (frequently asked questions) document.



Staff maintenance

- Delegate tasks and rotate staff whenever possible, in order to minimize the inevitable dullness of performing



the same repetitive task all the time.

Security

- Though it hasn't been the case so far, the d-shop is a place where sometimes very expensive hardware can be found. It is thus important to have security measures installed. Having some area where these pieces of hardware can be locked, and keeping the keys within the core d-shop team is an important measure.
- Maintain an updated inventory of the most expensive pieces of hardware, for keeping track of the currently available hardware, especially in cases when it is lent to colleagues.



Safety

- In this case, it is important is to have common-sense. Examine available machinery/tools and their potential risks, and make those explicit in the form of precautions and warnings. In addition to that, be sure to examine less visible safety and health hazards, such as fumes coming from the 3D printer, and address them properly.



What are the d-shop's best practices?

- A general guidance is avoiding food or drinks in non-resealable containers at the d-shop, both for the user as well as the material's protection.
- Be aware of local SAP regulations and follow them. For example, soldering might be restricted due to fire-hazard regulations, and flying drones might be forbidden in the premises. When in doubt, the best thing to do is ask.

Procurement

The d-shop's mission is making new technologies and hardware available to SAP employees, which usually means that items to be purchased will not be found in the SRM catalog. Following, there are some instructions on how to acquire material for the d-shop:

- Some items can be obtained second-hand for free through the local IT department. This reduces costs and limits the environmental impact of running a d-shop. A few examples of such items are: USB and video cables, keyboards, mice, old monitors, etc.
- Additional standard IT equipment can



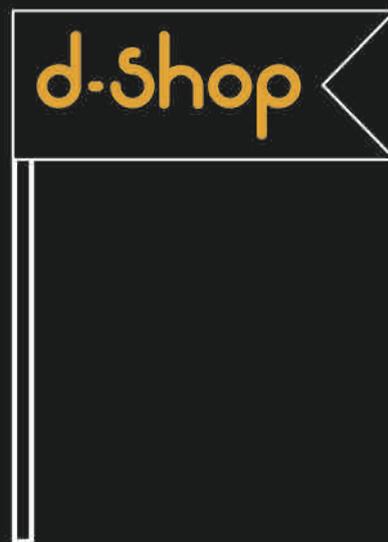
be acquired normally through SRM. Examples are: keyboards, mice, batteries, office equipment, etc.

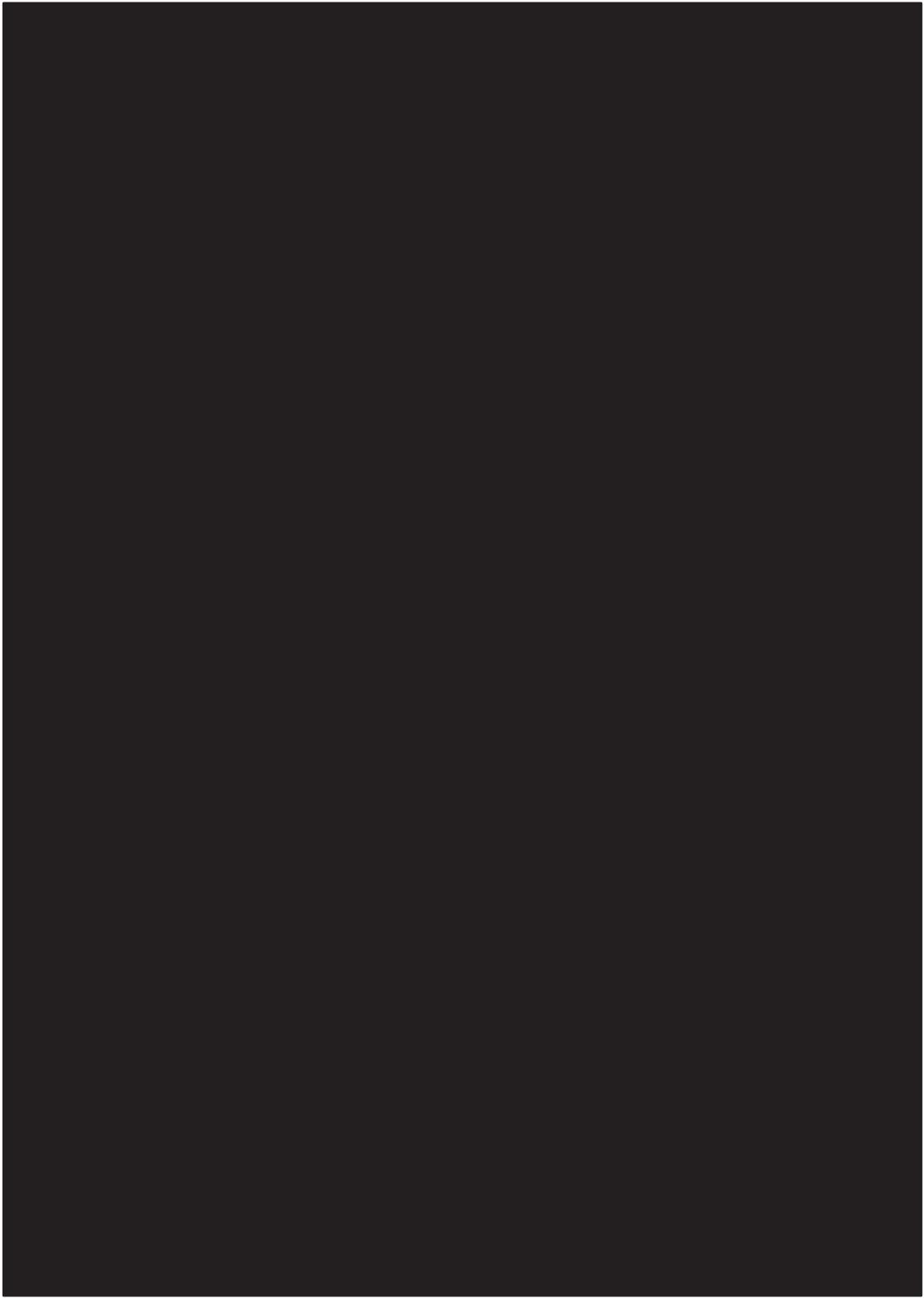
- Expensive items that require an SAP asset number are always ordered via procurement. The same is true for expensive equipment which is ordered from abroad and may be subject to taxation, despite the added delay and cost of doing so. For any further questions on this matter, please contact global d-shop (contact info in the "cards" section of this booklet).
- For other assets, buy yourself online using your own credit card, and expense it as a non-travel related expense. Take local rules into consideration and check with the cost center manager before ordering, to avoid misunderstandings. Make sure the invoice and delivery addresses are an SAP location, and not a private address.
- Small tools can be bought at your local hardware store, just make sure to keep the receipt and expense it. Examples: screwdrivers, pliers, etc.



Upkeep

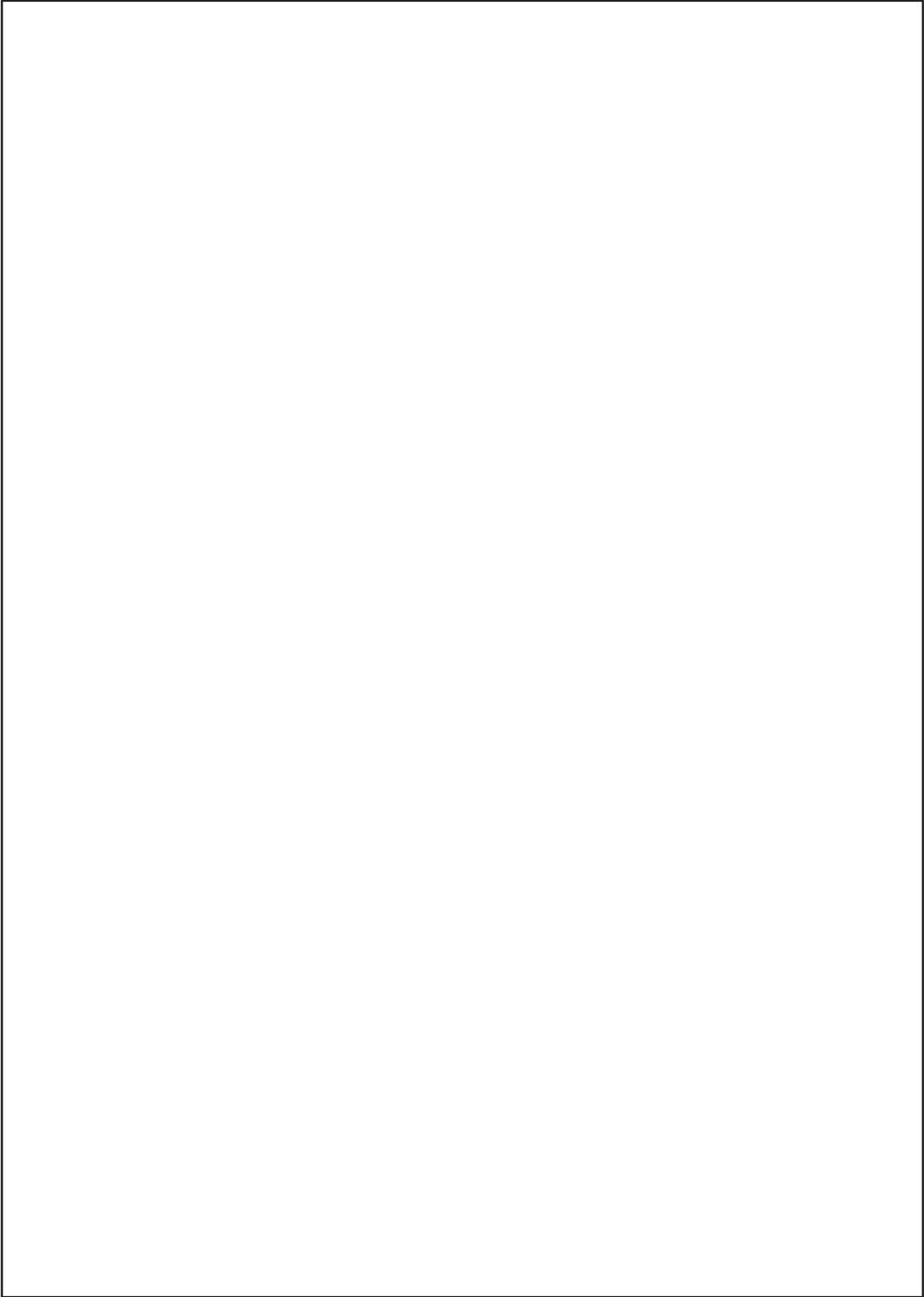
- The d-shop is a creative makerspace. Due to that, it is expected that it will start to become messy with the passing of time. Be sure to allocate a time-slot for reorganizing the space. Machinery may also require maintenance on a regular basis, to be kept at top operational performance.





Every d-shop is different because every SAP location is also different. Cultural, business and technical backgrounds and operations vary greatly. We hope you enjoyed reading the booklet, and found its contents useful, although we wish to emphasize that when it comes to creating and maintaining a d-shop, there is no fixed recipe for success. You should be mindful of context, and adapt to local demands and constraints to stay relevant and achieve success.

The global d-shop team would like to thank you for embarking with us on this short journey through the d-shop initiative. We also wish to thank all of those who make d-shop a reality, and invite everyone else to join our ever-growing community!



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2- Decision-making tool

Decision-making tool

Who are the targeted users?

- What is the expected primary group of interest for this content?
- Is there a way to make this content more enticing for the “non-primary” target users?
- Are there any specific teams inside SAP which might be benefited by this content, to whom it can be promoted?
- Is there, locally, a sufficiently big audience for this content, or maybe an international audience?

What kind of content is being produced?

- Does this workshop intend to solve a specific issue, initiate and inspire learning, deepen knowledge, or another purpose?
- How can you best frame content accordingly to the workshop's purpose?
- Can this content be framed in a way that its relevance transcends its local d-shop?
- Will the content focus on theory or prac-



Decision-making tool

tice? Is there a way to interconnect these for facilitating the understanding of concepts?

- Is the content explained in enough detail that it could be consumed by users individually, outside a workshop context?
- Can this content be presented in a better format by following d-shop's brand voice?
- Is there a way to promote continuous interest in the subject, beyond the frame of the workshop content?
- Can some of the content be presented visually (images, charts, maps, etc) rather than in words?
- Try to introduce the main concept/take-away from the workshop at least twice throughout the presentation, for improving recall
- Focus on the technology's essential concepts

What is the corporate context?

- Are there any current projects in SAP



Decision-making tool

which could be benefited by the content presented?

- Are there any use cases from SAP itself which might be explored in presenting the technology?
- Can this content be framed in a way that its relevance transcends its local d-shop?
- How does this content connect/coexist with existing workshops in the d-shop's portfolio?
- Is there already an existing workshop on this subject? Does the proposed workshop bring sufficient changes to justify the duplicate of material?

Distribution/presentation:

- What is the best-suited media for the type of content being produced?
- How would this content work when presented? How long would it take to be presented?



3- Word template



(TITLE)

(Subtitle)



1- Prerequisites, expected workshop timeframe, workshop's purpose, expected outcomes:

This is the opening of the workshop. Both in considering this as a companion document to users who are taking part in physical workshops, as well as users who might be using this document by themselves, it is important to “hook” the user’s interest at this point.

If this is a continuation to another workshop, or if it is started on the assumption that the user already possesses whichever type of knowledge, this should be clearly stated as pre-requirements, so that users might know which type of knowledge they must have (or seek) prior to taking part in this workshop.

The purpose and expected outcomes are useful in setting the users expectations prior to the workshop, as well as to have a point of reference that can help them understand why certain topics are being presented. It creates a bigger picture.



2- Workshop's table of contents, blueprint:

In this section, add the topics/chapters/subchapters dealt with in the document. Remember to create meaningful chapter titles, so that the user might have a notion of the workshop's development through its blueprint.



3- Why is this being presented in the context of SAP?

Even when users engage the d-shop out of curiosity and in search of knowledge, establishing a connection between this workshop and its relevance/context inside SAP only aggregates value in user's perception. Do not take the importance of establishing a link to the company as a constraint to the rest of the workshop. It does not have to only focus and revolve around solving internal issues.



4- Materials needed, how to obtain them:

This area is of extreme importance should the workshop documentation be reused in different locations or directly by users outside the context of a physical workshop. The users in these scenarios should be able to have access to all necessary material in order to follow through with the workshop. When in a physical workshop, this can be a good section to start the introduction to any hardware necessary in the workshop.



5- How the technology works, its history, how and what it is used for, challenges, hardware/software basics, constituting parts / demos / setup:

This section starts the theoretical part of the workshop. As important as establishing the content's context within SAP, is establishing its context externally. Don't forget to present a bit of its history, uses and constituting parts, before starting with exploring its functioning and potential challenges in using it. Depending on the type of workshop, this might otherwise be the area in which you present a demo of the technology, explain how to set it up and run it, etc. (mainly in theoretical workshops).



6- Achieving desired results through the technology / implementation / exercises:

After discussing and explaining the technology, the more hands-on section can take place, in workshops that are practice-based. While framing the amount of exercises to fit the time of the workshop, content creators might offer a few extra exercises to accommodate user's preferences or even users who are faster than others, so they have something to do while others finished the main proposed exercise group. Workshops that are aimed at solving a punctual issue may otherwise present how to achieve the desired results, and how to implement the technology concepts to do so.



7- Troubleshooting (as needed):

Sometimes a few areas where the user might encounter problems can be predicted. Additional value can be provided (especially to users who are consuming content away from a workshop environment) by explaining these scenarios and how to mitigate such issues. This section can be presented as needed, either throughout the exercises' section or after their completion.



8- Main takeaways, summary / solutions and codes to exercises which require them:

In addition to troubleshooting, some exercises might have specific solutions (especially code-based ones), which can be presented in this section for users to come back to in case they could not successfully complete an exercise. The main takeaways and summary of the workshop have as purpose to close the loop initiated by the expected outcomes discussed in the first section, returning to them and explaining which are the key takeaways each users should have after successfully completing the workshop. This gives a sense of closure and accomplishment to the user.



9- Further steps, complementary information, challenges

The final section presents possible paths the users might take, should they wish to continue their learning in the subject. Extra information and even challenges may also be presented, for those users who wish to get a bit more of the workshop than what is normally offered.



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d-shop

4- PowerPoint template



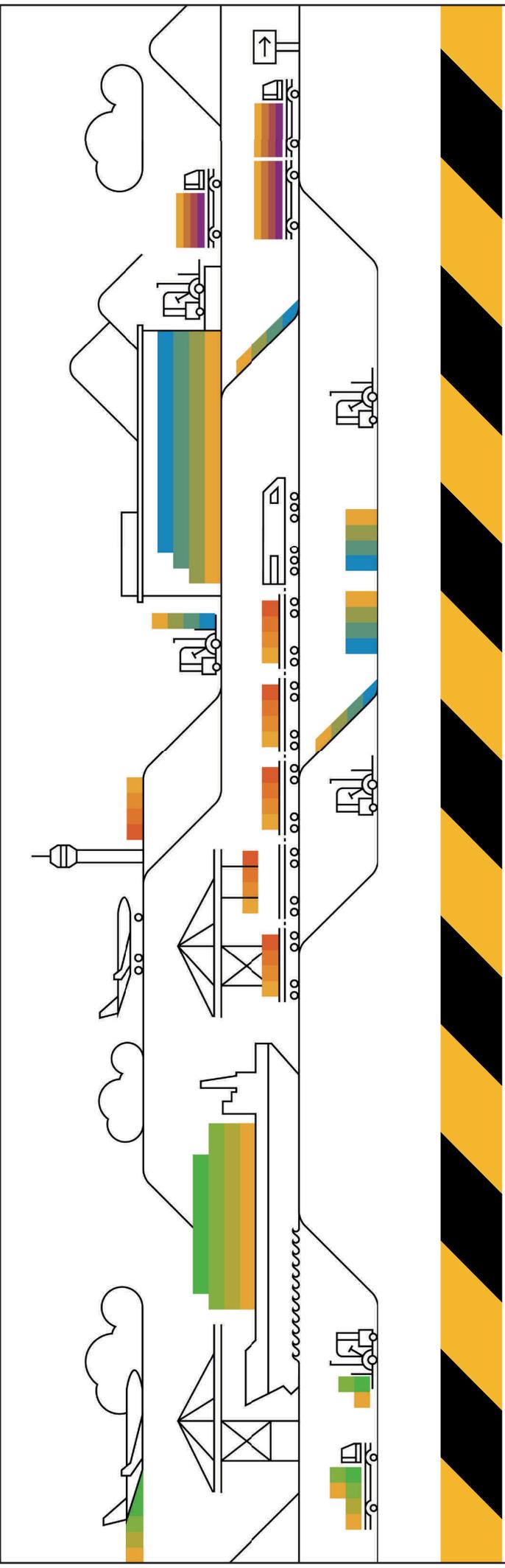
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Month 00, 2017

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Month 00, 2017

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Month 00, 2017



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Speaker's Name, SAP
Month 00, 2017





Agenda

Agenda item/divider headline

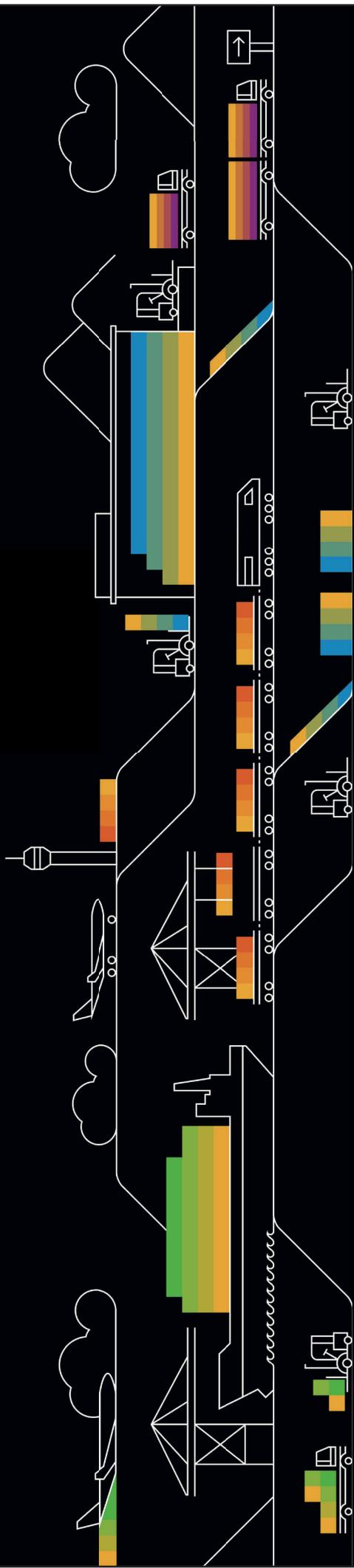
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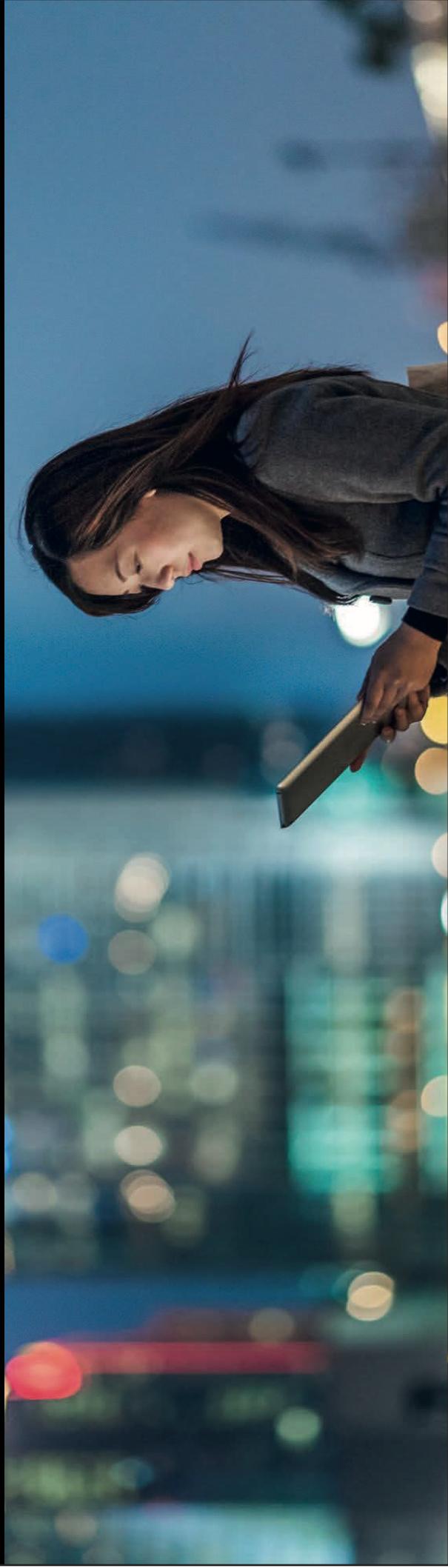
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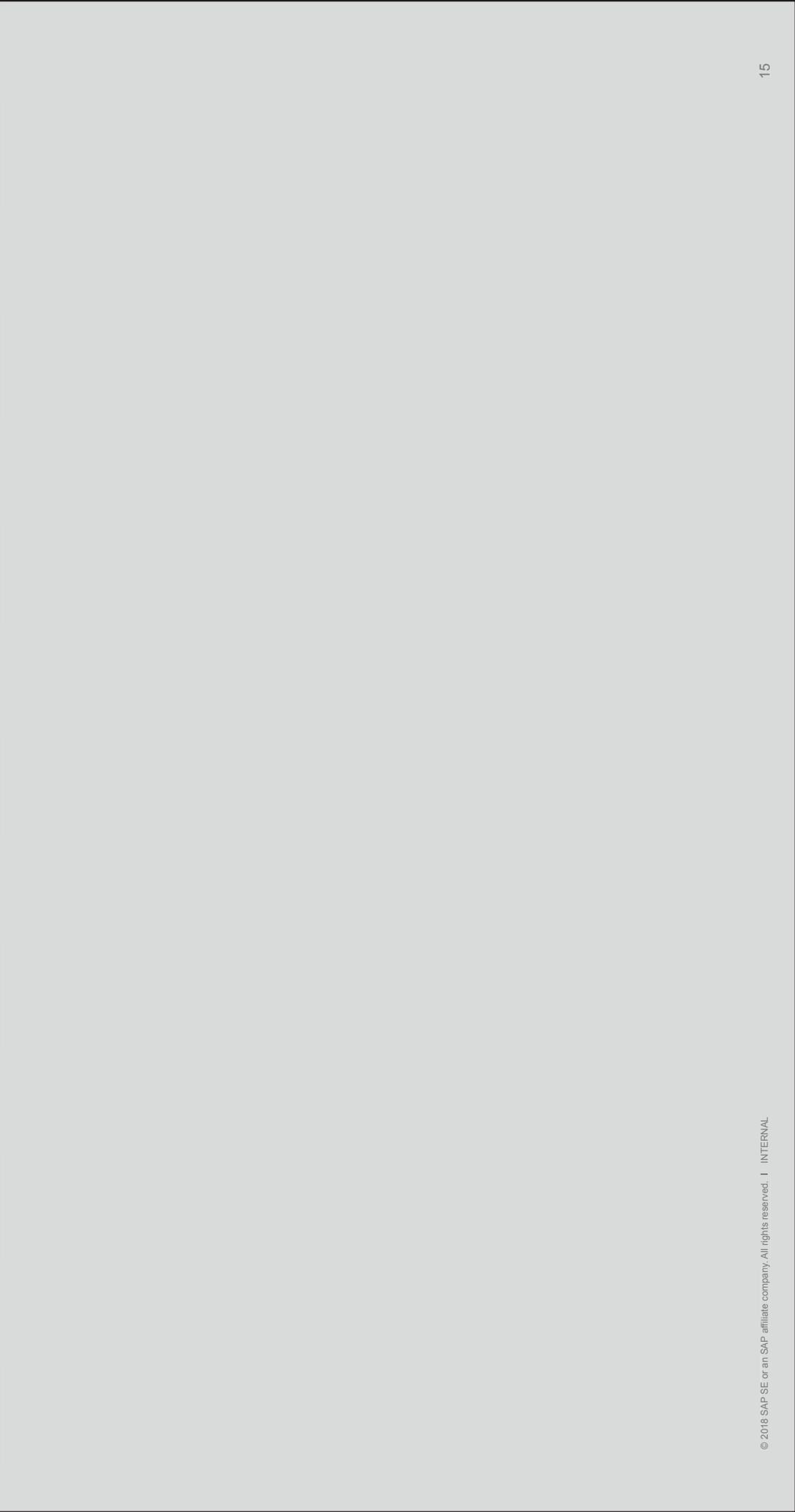
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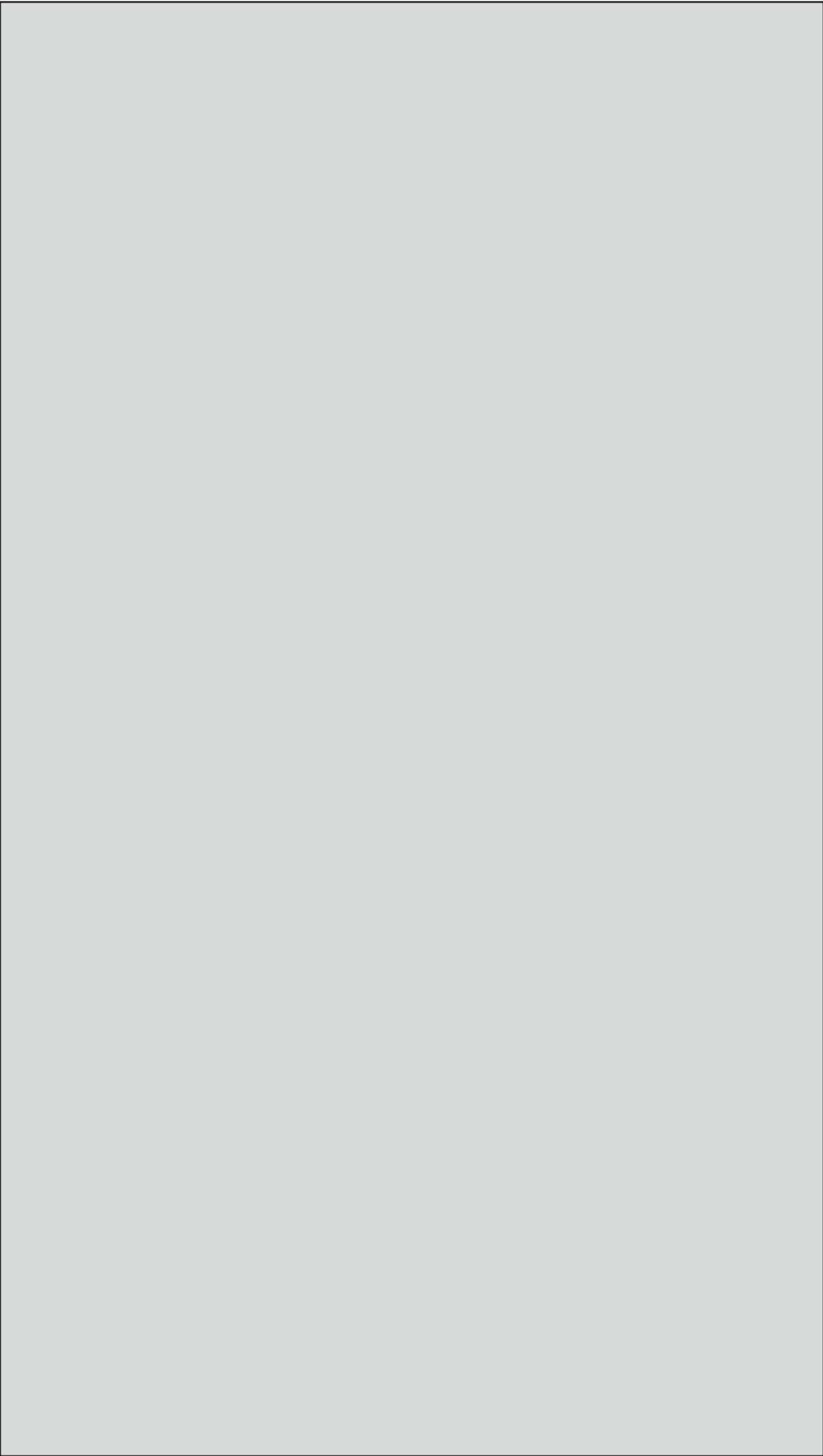


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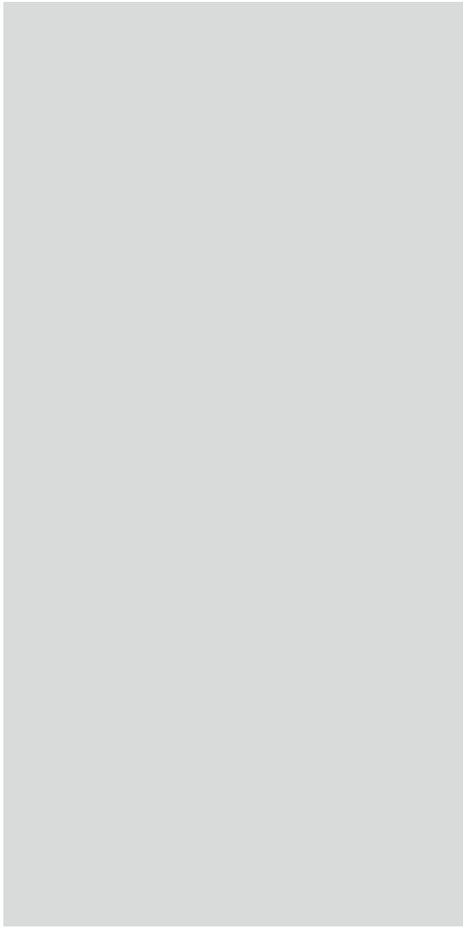
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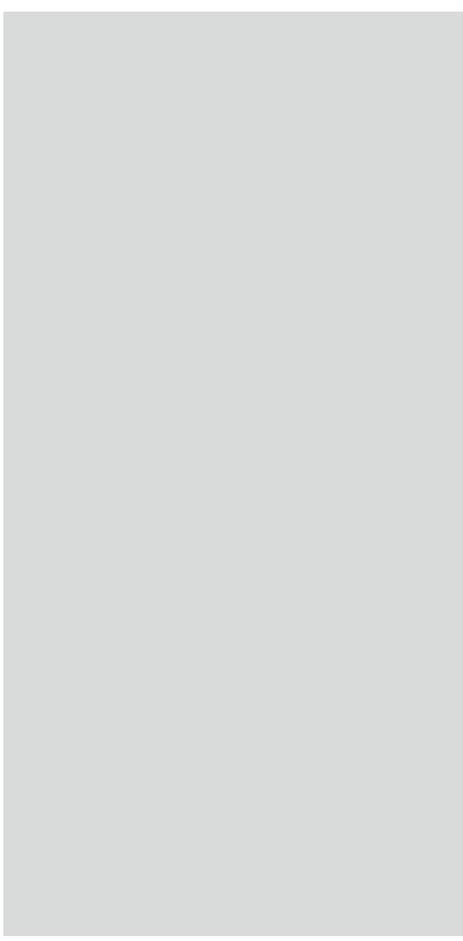


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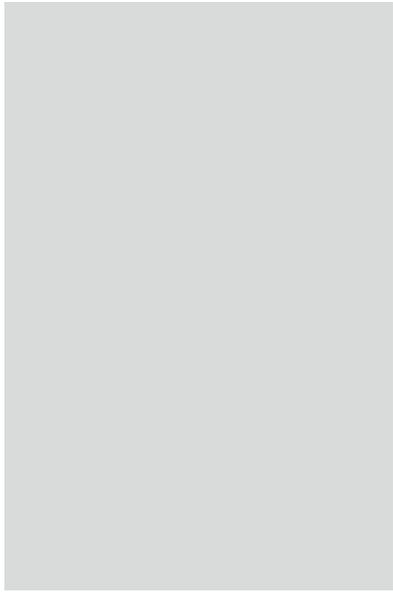


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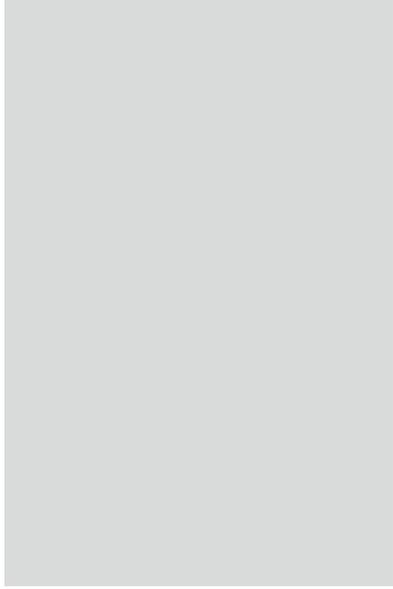
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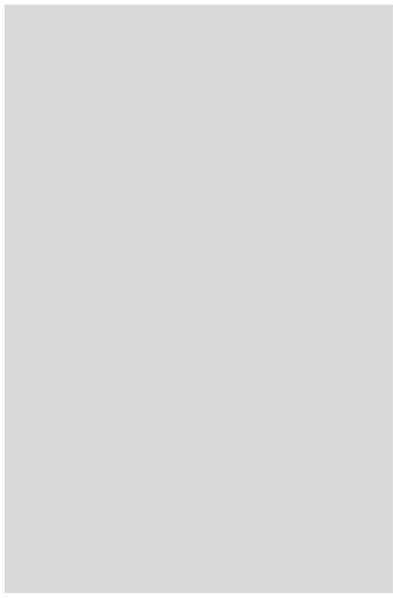
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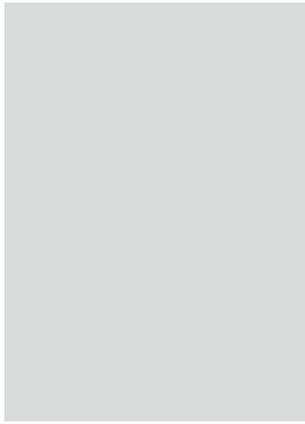
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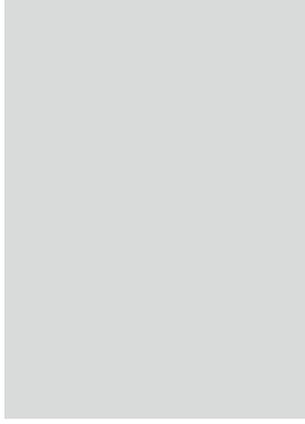


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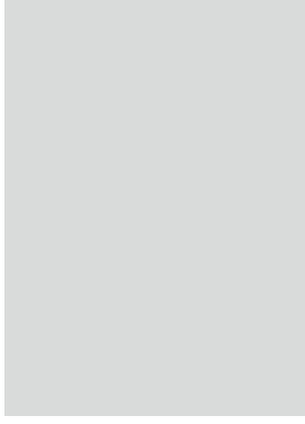
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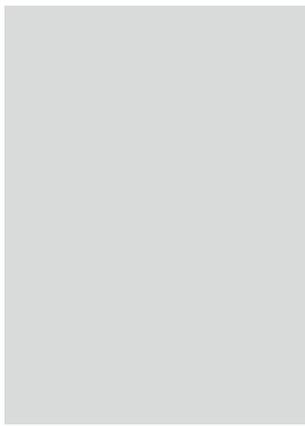
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Thank you.

Contact information:

First name Last name

Title

Address

Phone number

d-shop

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5- User interview questionnaires

d-shop USER INTERVIEWS

- Background and occupation:
 1. What motivated your first interaction with the d-shop?
 2. After your contact with the d-shop, have you suggested it to others inside the company?
 3. What is your level of interaction with d-shop's services (courses, talks, open hours, tours, events...)? Once - Few times a year - Monthly - Weekly
 4. What would it take for you to be more involved with the d-shop?
 5. What are your expectations in terms of outcomes from interacting with the d-shop?
 6. What would be your preferred means for feedback?
 7. If you could envision an ideal d-shop experience, what would that look like?
- Comments:

6- User interview compiled results

PRESENT STATE

- What motivated your first interaction with the d-shop?

General knowledge: 17

General curiosity in new technologies, desire to learn or specialize in a specific topic, knowledge sharing

Personal value: 11

Exploring own projects, having access to facilities/material and input on projects

Applied knowledge: 5

Work-related learning & learning to share with others

- What are your expectations in terms of outcomes from interacting with the d-shop?

General knowledge: 22

Having a general grasp on current topics, new experiences and empowerment for further advancement, kickstart learning

Personal value: 21

Learning in practice, inspiration, working on own projects, getting assistance, feedback & collaborating, networking, having access to facilities/material

Applied knowledge: 13

Being a part of the conversation inside the company, applying knowledge to work, learning how new technology can affect users' jobs, sharing knowledge with others

FUTURE STATE

- What would it take for you to be more involved with the d-shop?

d-shop-related: 44

Better facilities, new material, ready-stations for workshops, more content/workshops, tighter relationship of content with SAP, different perspectives

on a subject, course continuity, more flexible opening hours, increased accessibility, access to various experts, better divulging/call-to-action

SAP-related: 15:

Lack of time and incentive to participate in initiatives such as d-shop

- If you could envision an ideal d-shop experience, what would that look like?

d-shop-related: Content & Delivery: 21

Clearer presentation of course timeline and availability; more comprehensive courses with networking breaks, larger and frequent availability of distinct workshop expertise levels, ongoing experience and events in diverse places; better connection of content to SAP's reality; courses derived from or presented as projects, led by experts (potentially cross-company); intersectionality between technologies, better collaboration and sharing of content within locations, digital content, detached from the organization and straight-forward

Organization: 20

Always an instructor inside d-shop / full-time staff, comprehensive calendar of activities, a way to know what and where are the devices and how to start using them, be able to book times at the d-shop, better management of device booking, after work open hours, no strings attached participation, daily open-hours, creative marketing

Social & Experience: 18

Better way to network and find people with different expertise, more user awareness/engagement, a space to cooperate/collaborate and innovate, activity (movement, color, people, sounds), a place to get curious, inspired and grow individual potential, feeling of content usefulness after interaction

Space: 15

Geographically close, individual working stations where everything is readily available for the user, classroom setup where there's no need to turn around in the chair to see presentation and turn around to work on table, each user with own device, tutor with his and presentation screen for demonstration, bigger open space, lounge-like space, for better networking and discussion, more like a fully fledged makerspace/lab/hackerspace

Others (focus & material): 14