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# **A Framework for Assessing Organizational User Experience (UX)**

## **Capacity**

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Organizations across every industry are seeking to adopt effective User Experience (UX) practices, but they often struggle through an expensive process of trial and error because there is no standard methodology or approach for doing so. To address this challenge, we present the UX Capacity Assessment Framework (UXCAF) as a comprehensive tool for helping organizations understand the strengths and limitations of their current UX practices and identify targeted improvement strategies. Developed through a literature review and interviews with UX professionals, the UXCAF includes 21 concepts split into six dimensions of UX capacity: people, resources, practices and processes, organizational literacy, organizational decision-making, and benefits. We apply the UXCAF to three organizations in different sectors to show how organizations of any type and size can learn how to improve their internal UX practices and stay competitive in an increasingly digital world.

Keywords: organizational capacity; UX practices; UX capacity-building

## **Introduction**

Over the past decade, organizations across nearly every sector have undergone a major shift towards designing digital products that provide an engaging and enjoyable end-user experience. At the center of this shift is an increased effort to build internal User Experience (UX) teams, and a subsequent demand for skilled UX professionals to fill these roles (Gray,

2014). While some UX practitioners are skilled in front- or back-end web development, the UX profession is widely viewed as including the non-programming disciplines involved in creating interactive technologies: UX Design, Interaction Design, Information Architecture, Usability, and UX Research (Farrell & Nielsen, 2014). This distinction between UX (design and research) and software development is crucial, as both fields have developed their own techniques, processes, and tools for getting their work done. These disciplinary differences, in turn, create a number of challenges in terms of communication and collaboration (Bruun et al., 2018).

Building an effective software development practice is a complex process, and the industry has developed several guiding models and frameworks for this purpose (e.g., ISO/IEC/IEEE International Standard - Systems and Software Engineering -- Software Life Cycle Processes, 2017). Further, the practice of software process improvement (SPI) focuses on how to develop more reliable and better-quality software, improve customer satisfaction, and increase the ROI of software development processes (Lee et al., 2016). But while an effective and sustainable UX practice is integral to creating quality software, UX practices are not typically a part of SPI models (Kashfi et al., 2017). Although there are some frameworks explicitly for developing stronger UX practices, many are based on individual case studies that do not easily generalize to other contexts (e.g., Ede & Dworman, 2016; Liikkanen, 2016), while others only provide high-level descriptions and do not address the unique challenges faced by individual organizations (e.g., Chapman & Plewes, 2014). As a result, there is no standard methodology for UX professionals to systematically build an effective UX practice for their organization, leading many of them to instead adopt a time-consuming and expensive process of trial and error.

To fill this gap, MacDonald (2019) introduced User Experience Capacity-Building (UXCB) as “the intentional work to continuously create and sustain overall organizational

processes that make quality UX work routine.” A key aspect of UXCB is the distinction between the processes or behaviors that define an organization’s UX capacity (e.g., the use of UX methods and tools) and the activities used to build or sustain that capacity, which may include skill-building workshops, company-wide events, hiring new staff, or increasing the visibility of UX work (MacDonald, 2019). Conceptually, UXCB is a three-part process in which (1) the existing *conditions* of an organization inform the selection of (2) capacity-building *strategies* aimed at achieving (3) specific *outcomes* at the individual, organizational, and product levels. These outcomes, in turn, yield different conditions for future capacity-building efforts, which positions UXCB as “a continuous cycle of organizational growth and development” (MacDonald, 2019, p. 189). In this paper we seek to advance the discipline of UXCB by developing a framework that can be used by UX professionals to gain a deeper understanding of their organization’s conditions (i.e., their existing UX capacity) and then use that knowledge to select appropriate UX capacity-building strategies.

The remainder of the paper describes the development and application of the UX Capacity Assessment Framework (UXCAF). First, we discuss prior research about organizational UX practices and related frameworks. Next, we provide an overview of the framework creation process in HCI. We then describe our framework development process and present the full UXCAF, followed by our framework application process, which involved using the UXCAF to describe the UX capacity and generate targeted UX capacity-building recommendations for three distinct organizations: a non-profit organization, a museum, and an academic library. We conclude with a discussion of lessons learned about the UXCAF and directions for future research.

## **Related Research**

In this section, we discuss related research in two areas: UX frameworks and UX maturity

models.

### ***UX Frameworks***

Previous attempts to develop frameworks that describe effective UX practices are typically limited in scope or specific to a particular industry. As one recent example, Furniss et al. (2018) developed a framework for organizational UX competence in the fields of web design and safety-critical systems. This framework is unique because it includes factors that are typically separate from standard UX work practices, such as project documentation, mentorship from senior practitioners, and maintaining client relations, making this framework a valuable tool for helping junior and senior practitioners better understand the complex web of organizational factors that impact the success of UX projects. However, its project-centric emphasis and its focus on specific contexts (e.g., safety-critical systems) make it less applicable for other organizations wishing to establish more consistent and standardized UX practices. As another example, Merholz and Skinner (2016) identified 12 qualities of an effective design organization, such as strong design leadership and mentorship, using design to support the user's entire journey, and valuing diversity of perspectives and backgrounds. Like the previous work, this framework is valuable in highlighting the wide-ranging set of skills and competencies required to establish an effective UX practice. However, it was developed solely from the authors own professional experience and by studying some the top technology-driven companies in the world (e.g., Adaptive Path, IBM, Pinterest), making it difficult to apply in smaller organizations with fewer resources.

There have been several other attempts to develop a comprehensive UX framework based only on a single case study or project. For example, Liikkanen (2016) used a single case study of an engineering company to develop the SC5 design strategy framework. Likewise, Ede & Dworman (2016) offered a set of tips and UX best practices based on their

experience improving a single task flow of a complex interactive system. Similarly, Wiley and Getto (2015) proposed a UX workflow process based only on a single case study in which they improve the onboarding process of a mobile application. All of these frameworks are useful in highlighting some of the facets of an effective UX practice, but their generalizability to other contexts is limited.

At a more granular level, there have also been a number of previous efforts to identify specific UX best practices, though much of this work is limited to software engineering contexts (Ardito et al., 2014, 2011; Øvad et al., 2015). Other scholars have examined specific organizational contexts, such as integrating usability/UX into Scrum agile development processes (Lizano et al., 2014; Peres & Meira, 2015), or explored applying specific tools or methodologies, such as using the Kanban project management system to guide UX activities (Law & Lárusdóttir, 2015).

### ***UX Maturity Models***

Developing an effective UX practice is also closely related to the concept of maturity models. Originally developed as a way to help companies better utilize information technologies to achieve their business goals, maturity models rest on the assumption that all organizations can be described in terms of clearly defined stages of growth (Galliers & Sutherland, 1991). Maturity models not only define a linear path to peak performance or competence, they also identify key indicators of organizational behavior that define each stage (Röglinger et al., 2012). One of the first maturity models related to UX and usability was Earthy's Organizational Human Centeredness Scale (1998), but many others have followed, including the Human Factors International Usability Maturity Model (Schaffer & Lahiri, 2014), the Stages of UX Maturity Model (Chapman & Plewes, 2014), Nielsen's Corporate UX Maturity Model (2006a, 2006b), the UX Maturity Assessment Questionnaire (Sauro et al., 2017), and

the UX Capability/Maturity Model (Rukonić et al., 2019).

All of these models define key indicators of a UX-mature organization, such as the timing of UX involvement in the development process, the amount of in-house UX expertise and resources, the strength of UX leadership and culture within the organization, and whether UX processes are integrated with other organizational processes. These insights are useful for helping companies determine where they stand on the UX maturity spectrum, but there remain significant questions about the applicability of UX maturity models, especially for smaller organizations outside of the software development industry. First, most existing UX maturity models have not followed a rigorous process of development and evaluation, leaving “their validity, reliability and generalizability questionable.” (Lacerda & von Wangenheim, 2018, p. 103). Second, there is scant evidence that maturity models offer the kind of comprehensive strategic re-orientation that organizations need to improve their internal processes (Uskarcı & Demirörs, 2017). Third, while a maturity model illustrates the characteristics of a “mature” UX organization, documentation on how “mature” practices can be implemented is typically unclear or overly generalized (Kieffer & Vanderdonckt, 2016). In other words, a maturity model does not account for the unique circumstances and challenges faced by an individual organization; for example, the “best” user research methods or the “optimal” structure for a UX team will likely vary depending on the organization’s size, industry, and focus. It is also worth questioning whether all organizations across every sector are capable of achieving the highest stage of maturity and whether they should all travel the same path to get there. This critique is not meant to suggest that there is no value in developing and validating a comprehensive UX maturity model, which would undoubtedly help drive the UX industry forward. Instead, our work seeks to build on existing research on organizational UX maturity and signal an alternative pathway to strengthening and sustaining an organization’s UX practices.

## Creating Frameworks in HCI

A framework is “a set of interrelated concepts and/or a set of specific questions that is intended to inform a particular domain area” (Rogers, 2012). Within HCI, frameworks are “the foundation of strong research” (Girouard et al., 2018, p. 2); they bring together previously unrelated research, offer a full picture of research on a specific topic, help scholars identify open research questions, and provide context and explanation to research results. Frameworks can be presented in terms of steps to take, questions to answer, principles to follow, or dimensions to consider, but they all share the same general purpose of outlining the basic structure of a phenomenon in order to provide descriptive or predictive power (Hornecker & Buur, 2006; Rogers, 2012). Many frameworks have been developed for use in specific HCI contexts, such as healthcare (Yusof et al., 2008), exertion games (Mueller et al., 2011), or sustainability (Entwistle et al., 2015), or to describe specific techniques, such as tangible interactions (Hornecker & Buur, 2006) or reality-based interactions (Jacob et al., 2008).

Frameworks offer value to researchers and practitioners in two important ways. First, frameworks provide a common vocabulary to facilitate discussion and collaboration (Balestrini et al., 2017; Blackwell & Green, 2003; Mueller et al., 2011; Smith, 2014). In our case, any UXCB initiative is likely to be a collaboration between multiple stakeholders, so having a shared language is necessary to bridge disciplinary differences and establish common ground. Second, frameworks are exploratory and explanatory tools that can guide design or research efforts (Entwistle et al., 2015). Specifically, frameworks can offer *descriptive* power by identifying and categorizing relevant factors that need to be considered in design or research contexts (Riegelsberger et al., 2005; Smith, 2014) and *generative* power by helping designers or researchers explore alternative perspectives and identify new opportunities (Benton et al., 2014; Jacob et al., 2008). In the context of UXCB, a framework

should describe all the relevant factors that define an organization's current UX capacity (descriptive power) while also informing subsequent brainstorming efforts about which capacity-building strategies to pursue (generative).

There is no single methodology for creating a framework, but in HCI it is typically a two-step process: development and application. In the development phase, it is necessary to establish a firm conceptual grounding for the framework. This process can include synthesizing lessons from personal experience (Entwistle et al., 2015), conducting a comprehensive literature review (Riegelsberger et al., 2005), or a combination of both (Smith, 2014). In the application phase, the goal is to demonstrate the appropriateness of the framework through one or more case studies. While some researchers have included a deep analysis of a single case (e.g., Entwistle et al., 2015), it is more typical to apply the framework across three cases to demonstrate its applicability and validity in different contexts (e.g., Jacob et al., 2008).

## **Framework Development**

In this section, we describe our approach to developing the UX Capacity Assessment Framework (UXCAF). We begin with a detailed explanation of how the UXCAF was created followed by a brief overview of the final version of the framework.

### ***Stage 1: Defining UX Capacity***

The first stage of framework development is defining the scope, which in this case means providing an initial definition of UX Capacity to guide subsequent steps. The development of UXCB was heavily inspired by the Evaluation Capacity-Building (ECB) discipline, which is the study and practice of optimizing or sustaining effective evaluation practices primarily in the non-profit and government sectors (Hueftle Stockdill et al., 2002). Drawing from a seminal definition of ECB (Bourgeois et al., 2015), MacDonald (2019) defined



organizational UX capacity as “the competencies and structures required to employ UX processes, methods, and tools (capacity to do), as well as the organization’s ability to integrate UX knowledge into its decision-making process and create quality products (capacity to use)” (p. 188). Critically, this definition splits UX capacity into two distinct components: the capacity to “do” UX, or being able to select and correctly apply UX methods, and the capacity to “use” UX, or being able to incorporate UX knowledge into the product design and development process.

### ***Stage 2: Integrative Literature Review***

With the above definition as a starting point, we next searched the academic and professional literature for research on UX (or HCI) practices in non-academic settings. Many researchers have examined organizational aspects of UX, but this literature is spread across a variety of publications and there are few standard terms for describing this work. As a result, it would not be possible to conduct a systematic literature review on this topic. Instead, our aim was to collect and synthesize a sample of literature that represented different perspectives on industrial UX practices in order to identify common themes and concepts. This approach, called an integrative literature review, is appropriate for exploring new concepts because it allows researchers to combine divergent streams of research and generate new frameworks or perspectives on a topic (Torraco, 2005; Webster & Watson, 2002; Whitemore & Knafl, 2005).

Unlike a systematic literature review, the goal of an integrative literature review is to be representative rather than exhaustive. Therefore, following the same process described by MacDonald (2019), our search strategy started broadly with a search conducted in Google Scholar using general keywords (e.g., “organizational UX” and “UX industry”). This process allowed us to locate key texts, which we then supplemented with backward- and forward-

searching as well as more targeted searching of the ACM Digital Library, ScienceDirect, and Taylor & Francis to cast a wider net. These efforts resulted in a sample of 99 articles and books that discussed, critiqued, or studied UX practices in various practical settings.

Next, we used a concept matrix to analyze the collected literature. As explained by Webster and Watson (2002), a concept matrix begins with a set of theories, topics, or dimensions which then provide a lens to interpret and analyze the literature. For the UXCAF, the initial set of concepts was drawn from the Profile Framework for Organizational Evaluation Capacity (Bourgeois & Cousins, 2008), a commonly used framework in the ECB domain. To perform the analysis, a group of three research assistants reviewed a purposive sample of 68 articles (ensuring two researchers reviewed every article) and made an initial determination of which concepts, if any, were relevant to each one. Next, the authors collaboratively reviewed and discussed each reviewed article and made a final determination as to which concepts were most relevant, with some concepts changing slightly and some new concepts being added. Through this process, 13 articles were deemed not relevant or redundant (i.e., works by the same author with only minor differences). At the conclusion of our analysis, we ended up with an initial framework with 13 concepts grouped into six categories, which we further split into the capacity to “do” and “use” UX, a distinction we carried over from the Profile Framework for Organizational Evaluation Capacity. The Capacity to Do UX included 7 concepts grouped into three categories: human resources, organizational resources, and UX planning & processes. The Capacity to Use UX included 6 concepts, also grouped into three categories: organization-wide UX literacy, organizational leadership, and product quality.

### ***Stage 3: Iterative Brainstorming***

Once the initial framework was created, the research team used a series of team-based design

brainstorming activities to improve its understandability and completeness, following a process that mirrored how design teams collaboratively improve a design artifact (Gerber, 2009). At this stage, we considered various visual and non-visual formatting options for UXCAF and decided the clearest format was a table that listed all the concepts identified in Stage 1 along with a concise probing question to clarify the meaning and scope of each concept. These probing questions were drafted collaboratively and shown to experts outside the research team to ensure clarity. We also consulted the literature to identify key variables related to each concept and ensured that all relevant variables were covered by the probing questions. Through this process, we learned that some of the concepts were too ambiguous and needed further refinement, which led us to split some concepts into multiple concepts. We also further refined the probing questions and concept labels through a series of pilot interviews with UX professionals, which led to additional changes. At this stage, our framework now included 20 distinct concepts (up from 13 in the initial version) which were split into the following categories: people (previously “human resources”), resources (previously “organizational resources”), practices and processes (previously “UX planning and processes”), organizational literacy (previously “organization-wide UX literacy”), organizational decision-making (previously “organizational leadership”), and benefits (previously “product quality”).

#### ***Stage 4: Interviews with UX professionals***

Since the UXCAF is meant to capture all the aspects of an effective UX practice, we next sought to gather data on its understandability, accuracy, and completeness by conducting a series of interviews with experienced UX professionals. In each interview, participants were shown a draft of the UXCAF and asked to think aloud as they read through it. We then asked a series of questions about the terminology and language used, its overall understandability,

and whether there were any concepts that should be added or removed.

We completed interviews with 12 UX professionals; eight participants had worked on multiple in-house UX teams throughout their career, and the other four had worked with a single in-house team. All but two participants had at least 4 years of professional experience in the UX industry, with six participants having at least 7 years of experience (including four participants with 16 or more years of experience). Participants held a range of UX roles and positions, including senior UX researcher, senior UX designer, UX lead, design director, and UX manager. Participants held UX roles in a range of industries, including cybersecurity, education, finance/banking, e-commerce, data management, and the non-profit sector.

All participants reacted positively to the UXCAF. As a whole, they found the language to be clear (“the same kind of terminology we’re using in practice”), agreed that all of the concepts were relevant (“nothing is calling out to me to say this is superfluous or redundant”), and thought that it provided a complete overview of an organization’s UX capacity (“this covers the overall scope of everything”). Importantly, all of the participants said the UXCAF would be a useful tool for assessing their organization’s UX capacity and that they would use the results to drive improvement efforts. One participant described it as a “guide to help people in setting up an organization,” while others saw it as “a really good educational tool for leadership” that they would use to “hopefully make the case for more budget, people, etc.” As one participant explained:

“I’d be interested in two things: using it for myself and for my boss so that we could figure out what we could be doing better. I would also be really intrigued by running a few people at top senior level through this and see what they say. It helps me evangelize for UX to ask these kinds of questions. So, I can see it as being both advocacy and also a way for me to improve my own route.”

Participants also identified areas that needed to be clarified or expanded. For instance, our “Resources” dimension originally included just two concepts: support (software, hardware,

space, budget, materials) and guidance (goals, guidelines, design systems, metrics). However, many participants pointed out that budget was too important to be combined with other components and that “support” was too vague as a label. Thus, our final version of UXCAF included three concepts in the “Resources” dimension: budget, infrastructure (software, hardware, space), and guidelines and standards (goals, style guides, personas, etc.). Participants also suggested expanding a “professional development” concept to “professional growth” to incorporate both professional development and opportunities for career advancement (i.e., promotion). Another suggested change was revising the “team management” concept to include both the supervision of UX work and the quality of the teamwork within the UX team. Finally, many participants felt that “product quality” and “process improvement” concepts did not capture all the benefits of an effective UX practice. Therefore, we expanded the “Benefits” dimension to include a third concept, “user satisfaction” (i.e., evidence that users/customers are satisfied with the organization’s products and services). Thus, the final version of the UXCAF included 21 concepts, split into six broad categories.

### ***Stage 5: Final Framework***

The final UXCAF is presented in Tables 1 and 2, with each concept explained with a concise probing question and references to relevant articles from the HCI literature. As described previously, the UXCAF is split into two groups: the Capacity to Do UX and the Capacity to Use UX. The Capacity to do UX (Table 1) refers to the organizational competencies and structures that are necessary to successfully apply UX methods, processes, and tools. It is defined by (1) the people responsible for doing UX work, (2) the resources devoted to UX work, and (3) the organization’s enacted UX practices. The Capacity to Use UX (Table 2) refers to the ability to integrate UX knowledge into organizational decision-making processes

and create quality products. It is defined by (1) the organization's overall UX literacy, (2) the organization's UX decision-making structures and processes, and (3) the organizational benefits of an effective UX practice.

The breakdown of UX capacity into these two components – the capacity to “do” and the capacity to “use” – is an essential characteristic of the UXCAF because it emphasizes the fact that an organization must be able to select and correctly apply UX methods in order to incorporate the insights gained from those methods into the design of their products. The full UXCAF is presented in Appendix A.

### **Framework Application**

As we explained above, the next and final step of creating a framework is applying it in different contexts to demonstrate its appropriateness. In our case, we used the UXCAF to assess the UX capacity of three different organizations: a non-profit organization, an education-focused museum, and an academic library at a private university. We used purposive sampling to identify the three participating organizations in order to ensure our sample represented different organizational contexts and different industries. For each case study, we held an initial focus group with at least two representatives from each organization in which the UXCAF was used as an interview guide. These meetings lasted between 60 and 90 minutes and were audio-recorded. Next, the authors collaboratively analyzed the data from each organization and prepared a report outlining their assets (strengths), obstacles (weaknesses), and our recommended capacity-building strategies. We then held follow-up meetings with each organization to present our assessment and recommendations, with the UXCAF again used to structure the conversation. The data from each case study is summarized below through the lens of the framework. Note that all participating organizations and their representatives have been given pseudonyms to maintain anonymity.

Table 1: The Capacity to Do UX, i.e., the competencies and structures required to employ UX processes, methods, and tools.

Concept	Probing Question(s)	Relevant References
<b>PEOPLE</b>		
Staffing	Who does UX in your organization? How are they recruited?	(Chapman & Plewes, 2014; Hokkanen & Väänänen-Vainio-Mattila, 2015; Lisowska Masson et al., 2017; Rosenbaum et al., 2000; Teka et al., 2017)
Team Structures	What is the composition of UX teams? How are UX staff assigned to product teams? Are roles well-defined?	(Merholz & Skinner, 2016; van Kollenburg et al., 2017; van Kuijk et al., 2017; Yiu, 2013)
Team Management	How is UX work supervised? What is the reporting structure? How well does the UX team work together?	(Rohn, 2007)
Skills	What UX competencies does the UX staff possess? (includes both hard/technical and soft/non-technical skills)	(da Silva et al., 2013; Furniss et al., 2018; Goodman et al., 2011; Gray, 2016; Hokkanen et al., 2016; Hokkanen & Väänänen-Vainio-Mattila, 2015; Kerr et al., 2008)
Professional Growth	What opportunities do UX staff have for professional development or career advancement?	(Gray et al., 2015)
<b>RESOURCES</b>		
Budget	What is the funding model for UX work? How stable is it?	(Ardito et al., 2014, 2011; Larusdottir et al., 2017; Nieters et al., 2007; Rohn, 2007)
Infrastructure	What physical resources are dedicated to UX work? (e.g., space, software, hardware)	(Stone et al., 2016)
Guidelines & Standards	What other resources are used to support UX work? (e.g., UX goals, style guides, personas, metrics, etc.)	(Furniss et al., 2018; Hokkanen & Väänänen-Vainio-Mattila, 2015; Lisowska Masson et al., 2017; Merholz & Skinner, 2016; Roto et al., 2016)
<b>PRACTICES &amp; PROCESSES</b>		
Organizational Linkages	To what extent are UX processes integrated with other organizational processes? (e.g., software development)	(Budwig et al., 2009; Chapman & Plewes, 2014; Doherty & King, 1998; Fraser & Plewes, 2015; Joshi et al., 2010; Sundberg & Seppänen, 2014; van Kuijk et al., 2017)
Planning	How are UX activities scheduled and organized throughout the organization?	(Ardito et al., 2011; Chapman & Plewes, 2014; Kashfi et al., 2017; Sauro et al., 2017)
Methodology	When, how often, and what type of UX activities are used?	(Chapman & Plewes, 2014; Gray, 2016; Hokkanen & Väänänen-Vainio-Mattila, 2015; Winter et al., 2014)

Table 2: The Capacity to Use UX, i.e., the ability to integrate UX knowledge into organizational decision-making processes and create quality products.

Concept	Probing Question(s)	Relevant References
<b>ORGANIZATIONAL LITERACY</b>		
Leadership	How well is UX understood by organizational leaders?	(Bygstad et al., 2008; Chapman & Plewes, 2014; Gray, 2016; Rohn & Thompson, 2014; Rosenbaum et al., 2000; Sundberg & Seppänen, 2014)
User-Centered Focus	To what extent is there an organizational desire to understand and meet users' needs?	(Ardito et al., 2011; Hokkanen & Väänänen-Vainio-Mattila, 2015; Rosenbaum et al., 2000; Sauro et al., 2017; van Kuijk et al., 2017)
Communication & Visibility	How are UX results shared throughout the organization? How visible is UX work throughout the organization?	(Chapman & Plewes, 2014; Gray, 2016; Kashfi et al., 2017; Law & Abrahão, 2014; Law & Lárusdóttir, 2015; Ovad & Larsen, 2015; Rohn, 2007; Stone et al., 2016; Wilkinson & De Angeli, 2014; Yiu, 2013)
Participation & Collaboration	How much input or involvement do non-UX staff have in UX activities?	(Høegh et al., 2006)
<b>ORGANIZATIONAL DECISION-MAKING</b>		
Strategic Support	How often are UX insights used to inform "big picture" decisions and strategic priorities?	(Hokkanen & Väänänen-Vainio-Mattila, 2015; Liikkanen, 2016; Rosenbaum et al., 2000; Stone et al., 2016)
UX Decisions	Who is responsible for final UX-related decisions? (e.g., interface changes, new features, new research studies)	(da Silva et al., 2013; Larusdottir et al., 2017; Lisowska Masson et al., 2017)
Advocacy	Is there a "UX Champion" who effectively advocates for UX? Are they influential with organizational leaders?	(Gray et al., 2015; Mashapa et al., 2013; Rohn, 2007; Rosenbaum et al., 2000)
<b>BENEFITS</b>		
Product Quality	To what extent do the organization's digital products/interfaces adhere to accepted UX/usability principles?	(Ardito et al., 2014; Chapman & Plewes, 2014)
Process Improvement	To what extent is there an effort to iteratively improve the organization's UX methods or processes?	(Gray et al., 2015)
User Satisfaction	How satisfied are the organization's user/customers?	(Mashapa et al., 2013; Sauro et al., 2017)



## ***Case Study #1: Volunteer Hub***

Volunteer Hub (VH) is a tax-exempt, charitable organization specializing in helping people find volunteer opportunities in their local community. VH's workforce consists of approximately 60 full-time employees plus an additional 20 staff members who work part-time, seasonally, or as interns or volunteers. VH's primary product focus is their public-facing website, which mainly provides a searchable database of volunteer opportunities.

### *Capacity to Do UX*

***People.*** VH's UX team consists of a single UX Lead, Carmen, plus a former staff member who is working part-time as a service designer for one of the annual programs. Carmen started at VH less than a year ago and is the first person to hold a full-time UX staff position at the organization (*staffing*). As part of the role, Carmen manages the web team, which has representatives from the communications, marketing, programming, customer relations, and information technology departments. The web team meets on a bi-weekly basis to discuss ongoing and upcoming improvements to the website. For non-website projects, Carmen works with their supervisor to prioritize UX work/activities (*team structures*). Currently, Carmen reports to Jamie, the Information Technology director (who also supervises the part-time service designer), who in turn reports to the chief finance officer (*team management*). Carmen has a background in journalism and data visualization and feels very confident with research, particularly with qualitative methods. Carmen is also an experienced communicator and presenter, but feels weak in terms of user interface (UI) design skills (*skills*). Carmen is encouraged to seek professional development opportunities for mid-career UX professionals, though they haven't yet found something appropriate. They also feel that professional growth happens organically with every project (*professional growth*).

**Resources.** There is a limited budget for UX work at VH. Carmen’s salary is funded through a large infrastructure grant, which will cover the next 2 years. Otherwise, any additional funding would come from the general technology budget, which Jamie must request on a yearly basis (*budget*). Carmen has a new Macintosh computer with Adobe Creative Cloud (including Adobe XD). They rely on Google Drive for file storage and use free or trial versions of software for UX work, such as UserZoom for user testing and Otter for transcription. In terms of space, Carmen sits at a desk in the corner of an open office space, with software developers on one side and accountants on the other. When conducting user interviews, Carmen can reserve conference rooms ahead of time (*infrastructure*). VH has some “outdated” style guides and does not have any personas, journey maps, or other documentation about user needs and behaviors. Carmen has access to the website’s Google Analytics account, but admits not having much knowledge about analytics and not fully utilizing its capabilities. There are no existing metrics to define or measure the impact of UX work (*guidelines and standards*).

**Practices and Processes.** UX work is sometimes closely integrated with other aspects of the organization (i.e., when making specific website updates) but otherwise it operates mostly on its own schedule. For example, Carmen is not currently working with the part-time service designer, and does not have strong connections with the communications and marketing team due to recent staff turnover (*organizational linkages*). Scheduling UX work is done on an “ad hoc” basis, with Jamie typically working with Carmen to figure out what will be easy to accomplish. For Jamie, the main concern is preventing Carmen from being overloaded with projects and spending too much time on those that are less impactful (*planning*). The vast majority of Carmen’s UX work has been research-based, which primarily consisted of interviews to better understand VH’s primary user groups. While these projects have led to some website improvements, there is not currently a strong workflow to convert research

insights into design solutions through brainstorming, iteration, wireframing, and prototyping (*planning*).

### *Capacity to Use UX*

**Organizational Literacy.** The executive director of VH is aware of UX and sees it as something the organization needs, but does not necessarily see it as a top priority. Among the three C-level executives, there is uneven awareness with only the program officer being knowledgeable of UX methods and processes. The chief finance officer (who is also responsible for overseeing operations, including all UX work) is viewed primarily as a “numbers person” and does not seem to know much about UX at all (*leadership*). While there is a general desire to meet the needs of the VH’s users, there are often competing ideas of who the “users” really are, with some departments focusing on volunteers and others focusing on external partners. Being “user-centered” is therefore not a part of the institution’s culture (*user-centered focus*). To spread awareness of UX, Carmen often visits with the program managers to check-in and see how things are going, but few people ever visit Carmen. Carmen uploads some UX documents and reports to a shared folder and often gives presentations to program managers (*communication and visibility*). Because the rest of the organization is often pressed for time, few other staff members get involved in UX activities. Even the web team is not involved in day-to-day UX work despite sharing office space with Carmen (*participation and collaboration*).

**Organizational Decision-Making.** While funding for the UX Lead position did come out of a large infrastructure grant, both Carmen and Jamie feel that UX is not typically part of the organization’s strategic decision-making process. UX is not necessarily a part of the organization’s decision-making process because it’s still a new focus for VH (*strategic support*). Nominally, the web team (led by Carmen) is responsible for making improvements

to the VH website. However, any major website changes or technical decisions must first be approved by the chief program officer (*UX decisions*). There is no single “UX champion” at VH but there are a few people who serve as UX advocates. As the director of technology, Jamie is the primary advocate, though they described the role as more “reminding” people about UX rather than advocating for it. The chief program officer is also seen as a key ally, and there is a board member from a UX-focused company who is advocating for UX from a fundraising perspective (*advocacy*).

**Benefits.** Despite only being at VH for less than a year, Carmen has already been able to make an impact. Because there was no one who was fully in charge of the website before – and because they work so closely with the web team – Carmen is viewed as “the website person.” Therefore, Carmen’s insights and recommendations are usually implemented quickly, leading to website improvements (*product quality*). On the other side, the novelty of the position and the volume of work means that Carmen isn’t able to focus on creating or using a consistent UX process. Carmen seeks out resources on UX best practices as often as possible, but everything is a one-off project or activity (*process improvement*). Overall, VH’s users tend to be satisfied with their experiences. However, this could be attributed to the fact that VH does not have comprehensive data on user satisfaction and instead relies heavily on anecdotes. Additionally, VH does not gather data from dissatisfied users, which may further skew their perception of overall product quality and user satisfaction (*user satisfaction*).

### *Results*

According to our analysis, VH’s biggest UX capacity assets were a dedicated UX Lead, a relatively stable budget, a strong relationship with the web development team, and a leadership group who is supportive of UX. Their biggest obstacles were an ad hoc UX planning process, a lack of re-usable design elements and standardized templates, low

awareness of UX throughout the organization, reactive and sporadic UX advocacy, and limited data on user satisfaction. Based on this assessment, we recommended that VH formalize their web team into a UX committee to boost awareness of UX throughout the organization, get buy-in from other departments, and educate colleagues about UX methods and processes. We also suggested that this newly formed UX committee launch an effort to create a set of resources to guide or standardize UX work throughout VH, such as crafting UX goals, personas or journey maps, user research report templates, or standardized satisfaction metrics. Our other recommendations were focused on ways to strengthen connections with other departments, make UX work more visible, be more purposeful with UX advocacy, streamline their UX research process, and explore options to grow their UX team in cost-effective ways.

### ***Case Study #2: Gallant Museum***

The Gallant Museum is a national historical landmark and educational museum that provides a unique hands-on learning experience for over one million visitors a year. Located in a major metropolitan area in the United States, Gallant has approximately 350 employees, though that number fluctuates depending on seasonal hiring. Gallant's primary product focus is their in-person touchpoints (e.g., ticketing kiosks and interactive exhibits), their website, and curricular materials.

#### *Capacity to Do UX*

***People.*** Gallant does not have a dedicated UX department or any employee whose role is formally described as related to UX. Kelly, the vice-president for marketing and communications, manages a creative director, digital designer, and other designers in an in-house creative agency whose focus is on marketing materials (e.g., advertisements and

brochures). There is also a research team managed by Robin, the vice-president for education and program assessment. The organization is also willing to bring in outside agencies to fill gaps when necessary (*staffing*). Because Gallant does not have a dedicated UX department, UX activities are typically carried out by whichever team or department is responsible for a given project, so team structures vary from project to project (*team structures*). Most projects are overseen by the vice-president of the unit responsible for that particular project/product and thus do not have a standard structure or composition (*team management*). Skills held by current employees include statistics and data visualization, research and evaluation, marketing/social media, communication, and accessibility (*skills*). Staff are given some compensation to attend workshops and conferences, but there is no specific “promotion ladder” for staff with UX expertise (*professional growth*).

**Resources.** Funding changes on a project-to-project basis, and both Kelly and Robin feel that funding is adequate (*budget*). The Gallant is well-equipped in terms of both software and hardware used to carry out product development and research. However, the physical space of the museum is severely constrained so there is no dedicated space for UX work and limited space for adding new staff (*infrastructure*). Gallant has developed and continually updates style and content guides, visitor personas, project-specific metrics, and organization-wide goals through its strategic plan. Gallant also identified UX as a key pillar of its organizational strategy, but they have yet to define a specific UX philosophy or set of goals to guide or standardize UX work across the organization (*guidelines and standards*).

**Practices and Processes.** UX activities are well-integrated with departmental processes and many projects are often done collaboratively across the organization (*organizational linkages*). However, UX activities are not generally planned on a more strategic level and may be duplicated by one or more department. Additionally, the in-person museum

experience typically takes precedence, meaning some critical digital products like the website are excluded from planned UX work. There are some research and design projects that are cyclical, such as the museum map being re-evaluated and updated every two years (*planning*). Gallant uses a variety of research methodologies and collects large amounts of qualitative and quantitative data. While it is not consistently applied to every project, museum staff do seek to apply a user-centered methodology that includes research, evaluation, and iteration as part of the planned project lifecycle. Their main weakness in this area lies into their process of converting the large amount and variety of data into actionable user insights that can be incorporated into the design of their products and services, particularly in digital contexts (*methodology*).

#### *Capacity to Use UX*

***Organizational Literacy.*** Although UX is embedded in Gallant's strategic plan, not all members of the organization's senior leadership team understand the value of UX and its critical role in driving the museum's ongoing improvement efforts (*leadership*). Both Kelly and Robin feel that a desire to improve their visitors' experiences is embedded within every department. However, these efforts are often ad-hoc in nature because there is no shared understanding of what UX means for the organization and how it should be applied to each project (*user-centered focus*). The organization promotes UX work and results through quarterly all-staff meetings and have started revising job titles and role descriptions to be more reflective of the UX activities being done (*communication & visibility*). As mentioned before, UX activities are well-integrated and typically done collaboratively across departments (*participation and collaboration*).

***Organizational Decision-Making.*** The promotion of a UX mindset has primarily come from the top-down, as a directive from the Director and through the strategic planning process. As

a result, insights from UX work are regularly used to inform Gallant's decisions and strategic prioritization (*strategic support*). Although the marketing department is technically responsible for maintaining the website, they do not have the authority to make significant changes. All other UX work is distributed among various departments and teams, so there is no single person or entity responsible for making UX-related decisions (*UX decisions*). Gallant has several high-level UX champions, including Kelly and Robin, and Gallant's Director has also become a strong advocate for UX. As a leadership team, they strive to further integrate UX into the organization and push it to the forefront of the strategic plan. However, Gallant's lack of a dedicated UX expert often leads to miscommunication about the full range of UX and its benefits (*advocacy*).

**Benefits.** Staff view Gallant as a data-driven organization that generally strives to include UX insights into the improvement of the museum's services, but these efforts are primarily focused on the in-person museum experience. The museum website and other digital products are not currently part of this data-driven process, and their design feels dated and underdeveloped as a result (*product quality*). Both Robin and Kelly believe that the museum has both the desire and flexibility to improve and change their processes as needed. They strive to learn new methods and include new technologies in their projects, but the lack of a UX lead or UX-specific roles hinders their ability to use a consistent and standard design process (*process improvement*). Overall, staff believe the in-person experience at Gallant is excellent, with many visitors reporting that their visit was beyond their initial expectations. These findings are supported by user surveys, travel ratings (from TripAdvisor, Yelp, etc.), and the major user satisfaction research project Gallant runs every 4 years. Kelly feels that the gap between expectation and experience may be due to the poor website experience and/or poor marketing and branding of the organization itself (*user satisfaction*).



## *Results*

Our analysis revealed Gallant's UX capacity assets included a collection of dedicated and talented staff with strong cross-departmental collaboration practices, a significant budget for UX work, a strong research program, high levels of leadership support for UX, a well-developed strategic plan with UX as one of three key pillars, and an abundance of data showing strong user satisfaction with the museum experience. However, the Gallant's UX practices were limited by a lack of staff members specifically trained in UX, unclear ownership of UX projects and activities, an ad hoc planning process for UX work, an over-emphasis on the in-person experience at the expense of digital products and services, ongoing challenges converting research insights into design concepts, and low support for UX in key departments (IT, facilities). Therefore, our primary recommendations focused on finding ways to consolidate and standardize UX work across the organization. First, we recommended that Gallant seek ways to bring UX expertise into the organization, either by hiring new staff with UX expertise or supporting professional development for current staff. We also recommended that Gallant begin to articulate UX responsibilities on every project and assign staff to specific UX roles. We also recommended they increase their focus on improving the digital visitor experience, create a UX steering committee to oversee and plan cross-departmental UX projects, and share more UX success stories both internally and externally.

### ***Case Study #3: Metropolitan University Library***

The Metropolitan University Libraries (MUL) system serves over 50,000 university students at various levels and across several locations around the globe. Globally, MUL has approximately 360 full-time employees and provides a range of digital products including its main website, its online catalogues and subject guides, in-person library services and spaces,

and several other interfaces specific to specialized projects/departments.

### *Capacity to Do UX*

**People.** MUL's UX team consists of a director, Tracy, and two full-time UX staff members: Lee, a UX generalist, and Dana, a UX researcher who just recently joined MUL. The team is also supported by a part-time quantitative researcher and a student UX/UI intern. The UX team seems to be fairly successful at attracting and recruiting new staff, as their last opening attracted over 80 applicants (*staffing*). Project teams generally consist of a product owner, a web developer, one person from the UX team, and department stakeholders. As director, Tracy allocates UX staff to projects based on three levels of estimated UX need: small (serve as a UX consultant or have a one-off meeting with the project team), medium (the UX person is more embedded and does some UX work), or large (fully integrated UX person throughout project length). For medium and large projects, UX roles are often undefined and heavily dependent on the department that the project is originating from. On these projects, Tracy or Lee often end up serving as project managers as well as being responsible for the UX work (*team structures*). The UX team is close-knit and works together well. Like most libraries, MUL maintains a clear and direct reporting structure. When these interviews were conducted, MUL had just announced that the UX team was being moved out of the outreach and user services division to its own division, with Tracy being promoted to a division director and reporting directly to the Dean of MUL (*team management*). The team is skilled in UX research and strategy, project management, communication, accessibility, and content strategy. The part-time quantitative researcher offers expertise in digital and web analytics, while the recent addition of Dana as a UX analyst further strengthened the team's skills in qualitative user research and usability testing. For visual/graphic design, the team typically relies on a UX/UI intern (*skills*). MUL as a whole has trouble retaining people due to a lack

of professional growth opportunities, but Tracy hopes that giving staff opportunities for passion projects and allowing them to focus on skill development will help reverse this trend (*professional growth*).

**Resources.** There is a stable budget for the UX department and Tracy has the ability to request more if needed (*budget*). The UX team has dedicated space that they share with the web development team. Their office was renovated a few years ago and provides flexible space for usability testing, brainstorming, and other UX work. Because of their close relationships with the web development and IT departments, the UX team can easily request any hardware or software they need. They currently have subscriptions to Lookback, Sketch, Figma, Basecamp, Optimal Workshop, Qualtrics, Crazy Egg, UserZoom, and Google Analytics (*infrastructure*). The UX team has a vision document that outlines their overall strategy and approach and they have a variety of style and technical guides, including a metadata guide. However, one stated weakness is a lack of documentation, particularly about standardized impact metrics and data about user segments, behaviors, and needs (*guidelines and standards*).

**Practices and Processes.** The UX team operates as an in-house consulting team and is fairly well integrated with most departments, especially with web development and IT. The UX team also maintains strong relationships with non-IT departments and its members sit on several library-wide committees (*organizational linkages*). The UX team tends to get involved in the later stages of projects, but they are generally included from the start for major projects. As the team has existed for several years, all UX work throughout MUL is either organized or implemented by the UX department. As Director of UX, Tracy has the power to decide whether and how the team will be deployed, and this planning occurs on a quarterly basis (*planning*). The team's UX work tends to focus on project management and

evaluative research, and they see their role primarily as helping to shape product strategy and promote the importance of iterative design. Additionally, the UX team does a lot of work educating project teams about how much actual time and effort UX activities require. They do not have a standard set of methods or tools; instead, methods are chosen on a project-by-project basis (*methodology*).

### *Capacity to Use UX*

***Organizational Literacy.*** The MUL Dean and Associate Dean are both very supportive of UX and vocal about their support, but also acknowledges that they may not understand it fully. In general, organizational leaders that are more technology-minded have a better understanding and appreciation for the value of UX (*leadership*). Throughout the library, there is a big desire to understand and advocate for MUL's users (*user-centered focus*). UX results are typically shared directly with the project team via word of mouth or at various committee meetings a member of the UX team may attend. The bigger the project, the more likely that other staff will hear about it via email blasts or announcements at staff meetings. Currently, the UX team does not have a platform/portfolio where they showcase their past projects to other departments, and their office is not easily accessible or visible by other departments (*communication & visibility*). The UX team has hosted open houses/tours of their lab, held cross-department workshops, and actively engage non-UX project members in UX activities. While everyone is invited to participate in UX work, it is not clear to everyone at the organization that they can be involved. Further, while the UX team dedicates a portion of their time to educating other departments on how to carry out activities on their own, there is an over-reliance on the UX team to conduct user research. This often leaves the UX team struggling to manage the number and size of UX requests they receive (*participation and collaboration*).

**Organizational Decision-Making.** Lately, Tracy has been getting pulled into more and more high-level decision-making meetings at MUL. With the pending promotion to division director, Tracy will have even more opportunities to share UX insights with MUL leadership and ensure UX is part of strategic planning (*strategic support*). Because of the close relationship between the UX and web development teams, developers give the UX team a significant amount of trust and will implement any website changes the team recommends, giving Tracy and her team broad decision-making authority when it comes to interface improvements (*UX decisions*). The library Dean is a strong advocate and supporter of Tracy's UX team, giving the team room to experiment and try new things. Tracy and Lee are also adept at communicating the value and role of UX throughout MUL (*advocacy*).

**Benefits.** The team has been directly involved in making usability improvements to the MUL website and several of the library's other digital interfaces (*product quality*). They treat each project as a unique challenge and strive not to repeatedly use the same methods, so not much effort is placed on creating standardized or systematic UX processes (*process improvement*). While the team is satisfied with their impact, they admit to having limited contact with students and do not have concrete data on whether users are actually satisfied with the website and other digital services. They feel confident that users are satisfied with some website features or specialized interfaces they helped design, but don't have a "birds-eye view" of user satisfaction as a whole (*user satisfaction*).

### *Results*

Our assessment identified several key assets that provide MUL with a strong foundation for building additional UX capacity. Those assets included a talented and growing UX team with a clear reporting and management structure, a stable and sufficient budget for UX work, a dedicated space for the UX team and access to appropriate hardware and software, close

integrations between UX and other departments, deep support for UX among MUL leaders, the high visibility and awareness of the UX team's work, and the high levels of trust between the UX and web development teams. With that said, MUL also faced several obstacles to increasing their UX capacity, including difficulty retaining skilled staff members, an over-reliance on interns for key UX skills, a lack of documentation about MUL's users and resources for streamlining UX activities, a reactive planning process for UX work, uneven awareness throughout the library of how and when to engage the UX team, insufficient evidence of user satisfaction, and limited emphasis on standardizing UX practices. Based on these analyses, we recommended that MUL focus its UX capacity-building efforts on documentation and standardization. Specifically, we recommended they create targeted research programs to gather data on user satisfaction, use that data to create documentation about the needs and desires of various user groups, and create standardized protocols for its most-used UX methods. We also suggested they articulate the UX team's vision and workflow, develop a strategy roadmap to help them define UX priorities, hold more workshops to train colleagues on UX concepts and techniques, and seek additional ways to showcase UX success stories from past projects.

## **Discussion**

In this section, we summarize the results of using UXCAF across the three organizations and discuss opportunities for future work.

### ***Descriptive and Generative Power***

Our experience using the UXCAF provides strong evidence that the framework offers both descriptive and generative power. First, we were able to gain a thorough understanding of each organization's UX capacity, despite the fact that they varied widely. Using the UXCAF to structure the interview sessions proved to be an efficient and effective way of organizing

the data collection interviews because it kept the discussion focused on one concept at a time, grouped related themes together, and followed a logical order. When presenting the assessment results, participants also felt the structure and format of the UXCAF was a useful way to describe the full scope of their organization's UX practices and helped them better understand their strengths and limitations.

Second, the UXCAF proved to be a useful tool for generating ideas for UX capacity-building (UXCB) strategies. Here, the concise summaries that resulted from our analysis helped identify organizational assets and obstacles, which naturally led to brainstorming discussions about which UXCB strategies would be most effective. Importantly, because the UXCAF captured such a wide-ranging set of data, we were able to understand each organization's unique culture and then determine which UXCB strategies would be the most viable given their existing constraints. These factors heavily shaped our final recommendations, which is important because evidence from other disciplines has shown that successful capacity-building initiatives should be tailored to each organizational context (MacDonald, 2019). We believe that our ability to reflect these contextual elements in our recommendations was a determining factor in why our recommendations were received positively by the participating organizations, and helped ensure that none of them were rejected as being inappropriate or not feasible. While we did not set out to measure the longer-term impact of our recommended strategies, we learned that Metropolitan University Library was so satisfied with their UXCAF assessment that they delivered a presentation about their experience at a professional conference, while VH initiated a partnership with UX design students at a local university to jumpstart a major website redesign. In our future work, we plan to conduct more systematic follow-up studies with each organization to determine the long-term effects of their participation and which of our recommended strategies, if any, were implemented successfully. We also plan to conduct longitudinal action

research projects in which we use the UXCAF to develop, implement, and evaluate targeted capacity-building strategies with different types of organizations.

### ***Language and Terminology***

The three case studies showed the terminology embedded in UXCAF was both clear and easy to understand. These results were especially encouraging because none of the participants in the case study interviews were veterans of the UX industry, and in fact many would not self-identify as UX professionals at all. Nevertheless, all participants had no difficulty understanding the framework and many ended up naturally using terms from the UXCAF when discussing the assessment results. In follow-up studies we will examine whether participants' understanding and use of the framework's terminology persists over time, but for now we have strong evidence that UXCAF is effective in providing a common vocabulary, facilitating discussion, and enabling collaboration across disciplinary boundaries.

One additional finding regarding the UXCAF terminology was the value of separating the capacity to “do” UX and “use” UX. This distinction was a foundational aspect of the UXCAF, as it was taken directly from the Profile Framework for Organizational Evaluation Capacity it was based on. In interviews we conducted during the development stage, some UX professionals were initially confused by this distinction and suggested alternative labels (i.e., “internal vs. external”) and for this reason we paid particular attention to the utility of the do/use distinction during the case studies. However, we found that the dichotomy was not only valuable in structuring conversations with the organizational participants, it also became a useful lens for understanding the differences between the three organizations. For example, VH had high capacity to *do* UX because of their dedicated UX lead and strong connections between UX and web development, but were limited in their capacity to *use* UX due to a lack of understanding among VH leadership and low awareness of UX throughout the



organization. Gallant, with their supportive leadership and distributed model, had high capacity to *use* UX, but were limited in their capacity to *do* UX because they did not have dedicated UX staff and had low knowledge of UX best practices. Finally, MUL was strong in both its capacity to do and use UX as a result of having a skilled UX team, deep integration of UX with other departments, strong support from leadership, and high awareness of UX throughout the library. Based on these results, we now believe the do/use structure of UXCAF is one of its biggest assets.

### ***Flexibility***

One of the primary goals of this research was to develop a framework that was applicable in a variety of contexts because a large portion of research on industry UX practices focuses on software engineering contexts, even though UX practices are now being used across nearly every sector. In fact, a recent report from the Nielsen Norman Group reported that almost three-quarters of UX professionals work *outside* of the technology industry, in sectors like finance/banking, education, government, healthcare, retail, media, advertising, entertainment, and non-profits (Rosala & Krause, 2019). We therefore set out to develop a framework that could be used in any organizational context, regardless of size or sector, and our results were very promising in this regard. Although each organization had its own unique circumstances, we did not have to alter the framework in any way to make it more understandable or more appropriate for each industry. However, one limitation is that all three participating organizations did have at least some awareness of UX and some semblance of an established UX practice prior to participating in the study. In the future, we plan to apply the UXCAF to an even wider variety of organizations, especially those with limited (or non-existent) UX practices, to ensure it can be used by organizations with any amount of UX capacity.

### *Self-Assessment vs. Expert Assessment*

Our results so far suggest that UXCAF has the potential to be a valuable tool for organizations wishing to grow their UX capacity, but in our case studies we worked as external experts to assess each organization's UX capacity. Although all the participating organizations appreciated our assessment and found it to be a valuable experience, key questions remain about who can – and should – conduct the assessment. Would it be possible for organizations to apply the UXCAF on their own as a self-assessment tool or is it better suited to be used by outside experts?

When discussing their experience with the UXCAF, all participating organizations felt that they would be able to apply the UXCAF themselves if they had to. As a whole, they saw the UXCAF as a tool they could continually refer to for guidance and use to track the progress of their UX capacity-building efforts. But to be an effective self-assessment tool, the UXCAF would need additional enhancements to ensure organizations are getting as much value as possible. For example, some organizations may not have enough knowledge of effective UX practices to determine whether the size and structure of their UX team is a strength or a weakness. Or, an organization might correctly identify a lack of integration between UX and other organization processes as a weakness but struggle to determine which capacity-building strategies would best address the issue. In our future work, we plan to further develop the UXCAF as a self-assessment tool by focusing on two areas: (1) converting the UXCAF to an assessment rubric that describes different capacity levels for each concept; and (2) creating a database of UX capacity-building strategies that includes implementation guidelines and identifies which aspects of UX capacity are targeted by each strategy.

While creating a self-assessment version of UXCAF is an important goal, we also acknowledge that it can still provide value as an expert evaluation tool. In fact, one

participating organization said they would rather have the assessment conducted by an outside expert because it would make a stronger case to leadership than an internal assessment. The case study results provide evidence that UXCAF is an effective expert evaluation tool, but we acknowledge that, as creators of the UXCAF, we were obviously well-versed in its terminology and had little difficulty applying it. To expand the UXCAF's use as an expert evaluation tool, another area of future work is examining whether and to what extent the UXCAF could be learned and applied by other experts. What level and type of experience is sufficient to be considered a UXCAF expert? How much documentation would be required and would any specialized training be needed? Would different experts reach the same conclusions when using UXCAF to examine the same organization? With these questions answered, we believe the UXCAF could become a valuable tool in any UX/HCI evaluator's toolkit.

### ***Qualitative vs. Quantitative Assessment***

We used UXCAF as a qualitative assessment tool, with our evaluation of each organization's strengths and weaknesses and our recommendations based solely on our expert judgment. But we suspect that many organizations might have two questions after completing the assessment process: how did we do and how do we compare with our peers? Both of these questions highlight the need to add a quantitative component to the UXCAF, and there is some precedent for taking a more quantitative approach to capacity assessment. For example, Bourgeois, Toews, Whynot, and Lamarche (Bourgeois et al., 2013) created an assessment rubric in which organizations would self-assess their progress on each dimension of evaluation capacity on a 1-4 scale (low, developing, intermediate, and established) and those ratings were then combined into a total score. Their instrument was based on data collected in multiple case studies and has been applied successfully in different contexts, including

government agencies (Bourgeois et al., 2015) and public health departments (Simmons & Hotte, 2015). In our future work, we plan to apply UXCAF to more organizations in other contexts in order to gather more examples of the various levels of UX capacity across each component of the UXCAF. From there, we can develop a more robust assessment instrument that can provide organizations with a more contextualized understanding of where they are on the UX capacity spectrum. Through this work, we also hope to identify quantitative measures of UX capacity, which may include factors like team size, designer-developer ratio, UX budget, average amount of time spent on UX work, or similar measures.

### ***Recommendations vs. Guidance***

One of the major benefits of using the UXCAF was our ability to generate contextualized recommendations for each organization based on our assessment of their strengths and weaknesses. All the participating organizations found these recommendations valuable and said they would begin implementing some of them as soon as possible, but there were also several requests for more guidance on how exactly a recommendation could be implemented. For example, one of our recommendations for VH was to establish an organization-wide UX committee and to focus on crafting UX goals for the organization. While they were receptive to this idea, they also wanted to see examples of UX committee charters or example documentation from other organizations that they could use to inform their approach. Likewise, Gallant enthusiastically embraced our recommendation to add more in-house UX knowledge but were unsure how to structure UX roles and write clear job responsibilities. From these conversations, it was clear that while our recommendations were valuable, they would be much more useful if we could also provide more detailed guidance or examples from other organizations. Therefore, another area of future research is to collect case studies of exemplar UXCB initiatives from different organizations and develop a database of

templates, guidelines, and trusted tools or platforms that can support different UXCB strategies.

## **Conclusion**

With organizations across nearly every sector recognizing the need for their own in-house UX expertise, they face the unique challenges of building an effective UX practice with little established guidance on where or how to begin. To address this issue, we created the User Experience Capacity Assessment Framework (UXCAF) as a tool for helping UX professionals systematically create and sustain effective UX practices for their organization, and hopefully avoid the often time-consuming and expensive process of trial and error. Building off previous work on User Experience Capacity-Building (UXCB), our goal with the UXCAF was not just to define what organizational UX capacity means, but also to show how an in-depth understanding of an organization's UX capacity can be used to inform capacity-building efforts.

We started with a definition of UX capacity as “the competencies and structures required to employ UX processes, methods, and tools (capacity to do), as well as the organization's ability to integrate UX knowledge into its decision-making process and create quality products (capacity to use)” (MacDonald, 2019, p. 188). A key distinction of this definition was the separation of UX capacity into the capacity to “do” UX and the capacity to “use” UX, reflecting the fact that UX capacity is defined not only by the methods and tools used for UX purposes (“doing UX”) but also whether and to what extent there is investment from leadership and participation and buy-in from the entire organization (“using UX”). Using this definition as a starting point, we then created a preliminary version of UXCAF by conducting an integrative literature review to gather insights from existing HCI research and further iterating it based on feedback from experienced UX professionals. We evaluated the

UXCAF by applying it to three distinct organizations: a non-profit, a museum, and an academic library, using the framework to describe each organization's UX capacity and generate targeted recommendations based on our assessment of their strengths and weaknesses. Our experience using the UXCAF was positive, with the case studies demonstrating its descriptive and generative power, accessible language and terminology, and flexibility for use in different contexts. We also proposed several areas in need of future research, including developing the UXCAF into a self-assessment tool, incorporating more quantitative measures into the assessment process, and developing more resources to accompany different UX capacity-building strategies.

Our work developing and evaluating UXCAF has emphasized the importance of taking a broad-based approach to building UX capacity. Specifically, organizational leaders and UX professionals at any level who wish to improve their organization's capacity should look at both their current capacity to *do* UX (i.e., their existing structures and competencies) as well as their capacity to *use* UX (i.e., their ability to integrate UX into decision-making processes across all facets of the organization). Using the UXCAF, UX professionals can gain unique insights into their organization's current UX practices, identify existing strengths and weaknesses, and develop targeted UXCB strategies that can lead to a more sustainable and effective UX practice.

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## Appendix A: The UX Capacity Assessment Framework (UXCAF)

<b>Capacity to <u>Do</u> UX:</b> The competencies and structures required to employ UX processes, methods, and tools		
People	Staffing	Who does UX in your organization? How are they recruited?
	Team Structures	What is the composition of UX teams? How are UX staff assigned to product teams? Are roles well-defined?
	Team Management	How is UX work supervised? What is the reporting structure? How does the UX team work together?
	Skills	What UX competencies does the UX staff possess? (includes both hard/technical and soft/human skills)
	Professional Growth	What opportunities do UX staff have for professional development or career advancement?
Resources	Budget	What is the funding model for UX work? How stable is it?
	Infrastructure	What physical resources are dedicated to UX work? (e.g., space, software, hardware)
	Guidelines & Standards	What other resources are used to support UX work? (e.g., UX goals, style guides, personas, metrics, etc.)
Practices & Processes	Organizational Linkages	To what extent are UX processes integrated with other organizational processes? (e.g., software development)
	Planning	How are UX activities scheduled and organized throughout the organization?
	Methodology	When, how often, and what type of UX methods are used?
<b>Capacity to <u>Use</u> UX:</b> The ability to integrate UX knowledge into organizational decision-making processes and create quality products		
Organizational Literacy	Leadership	How well is UX understood by organizational leaders?
	User-Centered Focus	To what extent is there an organizational desire to understand and meet users' needs?
	Communication & Visibility	How are UX results shared throughout the organization? How visible is UX work throughout the organization?
	Participation & Collaboration	How much input or involvement do non-UX staff have in UX activities?
Organizational Decision-Making	Strategic Support	How often are UX insights used to inform "big picture" decisions and strategic priorities?
	UX Decisions	Who is responsible for final UX-related decisions? (e.g., interface changes, new features, new research studies)
	Advocacy	Is there a "UX Champion" who effectively advocates for UX? Are they influential with organizational leaders?
Benefits	Product Quality	To what extent do the organization's digital products/interfaces adhere to accepted UX/usability principles?
	Process Improvement	To what extent is there an effort to iteratively improve the organization's UX methods or processes?
	User Satisfaction	How satisfied are the organization's users/customers?