

Flow of Competence in UX Design Practice

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ABSTRACT

UX and design culture are beginning to dominate corporate priorities, but despite the current hype there is often a disconnect between the organizational efficiencies desired by executives and the knowledge of how UX can or should address these issues. This exploratory study addresses this space by reframing the concept of competence in UX to include the flow of competence between individual designers and the companies in which they work. Our reframing resulted in a preliminary schema based on interviews conducted with six design practitioners, which allows this flow to be traced in a performative way on the part of individuals and groups over time. We then trace this flow of individual and organizational competence through three case studies of UX adoption. Opportunities for use of this preliminary schema as a generative, rhetorical tool for HCI researchers to further interrogate UX adoption are considered, including accounting for factors that affect adoption.

Author Keywords

Interaction design; practice-led research; competence.

ACM Classification Keywords

H.5.m.

INTRODUCTION

In the past decade, there has been a rapid adoption of UX in a wide range of corporations, many of which have no substantial history of a UX or design approach. This adoption is a potential issue to the research community, as the success of many of these organizational shifts relies on positive corporate acceptance in often engineering-dominated cultures. While the research community has viewed this transition more hesitantly, UX and design adoption—often occurring in tandem—is happening quickly in very large organizations. Traditionally engineering-dominated companies such as IBM, Intel, and Microsoft have invested substantial capital into creating sustainable, organization-wide design

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cultures, which raises many questions about the implications for UX practice and research. In this most recent adoption period, many organizations appear to desire UX talent, but individual designers frequently work in companies whose internal culture is hostile to the consideration of new perspectives on design or UX.

In addressing this adoption incongruity, we take the perspective of the individual UX designer rather than that of the organization, with special interest paid to the impact one's personal competency might have (either individually or in aggregate) in the evolution of a company's culture as it relates to UX and design. We shift from the organizational lens—which is well documented in business settings through research on change management—to the role of the individual designer, and how that designer's perception and utilization of UX competencies, an existing set which are documented by [13], in tandem with their underlying design identity, impacts how they interact with and build a UX and design culture in an organization. The literature has addressed issues of competence in a broad sense—looking across professional domains of design from an educational or licensure perspective—but has not substantially addressed this situated sense, where a designer is interacting with a culture potentially antagonistic to design or UX.

Within the framing of individual design competence in organizational change, the contributions of this paper are two-fold: 1) To understand some of the elements of competence in UX practice from successful practitioners, which has a direct impact on how we train future UX designers and how we intend to support UX practice through future research; and 2) Map the flow or movement of competence between UX practitioners and companies through several case studies, allowing us to document the UX adoption process in an exploratory way. This flow perspective allows us to look not only at competencies essential to individual success, but also competencies that allow for broader adoption of UX principles and practices in companies.

REVIEW OF LITERATURE

In focusing our attention on the competence of individual UX designers, and how this competence relates to the organization at large, we will explore a range of literature related to UX adoption in corporate environments, how this adoption has been discussed in the CHI community historically, and then how these macro-level perspectives relate to the issue of individual competence.

UX Adoption in Corporate Environments

Adoption of UX as a strategic advantage has been a significant driver in many companies in the past several years. According to a recent article in the Harvard Business Review, “The value of UX as a corporate asset is no longer in question” [7]. There are many ways of incorporating UX into existing companies, ranging from lean UX to customer-driven or R&D-based UX [7], and outside of specific implementation strategies, a renewed focus on how technology is used and felt by consumers is gaining favor [6].

Even as companies have gotten on the “bandwagon” and hired UX designers, managers, or interns, it doesn’t necessarily indicate that they have a broader knowledge of what UX is, what it can do for their business, or how they expect UX designers to drive integration of these concepts in their business environment. This fundamental issue of adoption strategy raises questions about the nature of UX, and what value it might have for industry that have been left unanswered in many corporations, with numerous UX designers caught in the crossfire. Beyond a handful of case studies and panels at CHI [8,17,20,21], this is not an area that this research community has substantively explored, even while corporations and management are currently working through these issues in their quest for adoption of UX or a design culture.

A wide range of companies are shifting tentatively or radically toward a design and UX-informed approach. High profile organizations like HP or Intel have been working on their design strategies for several years, while recent advances have taken place with the creation of a company-wide design initiative at IBM [12]. So we see a range of approaches to UX and design adoption, from tentative long-scale shifts to more radical restructuring of organizations. While most visible press coverage has focused on large transitions led by executives, we will focus this paper more on the contributions of individual designers in small to medium-sized organizations to capitalize on the capabilities of individual design practitioners.

UX Adoption and CHI

There has been increased interest in the adoption of UX, moving past the arguments based on usability and efficiency grounded in the efforts of usability engineers in past decades. Research in this area began as more general work on design processes, particularly around participatory or collaborative design [3,4,5,18], but the conversation has since extended to the competencies of usability specialists [11], and the impact of ‘offshoring’ or non-located work environments [8]. In the past few years, case studies and panels at CHI have brought additional focus to the issue of UX adoption, both in situated work environments [20] and in a broader strategic sense [17,21]. The Thompson et al. panel [21] in particular brings forward a number of important provocations that have not yet been answered in detail in the HCI research community. These include issues

UX designers face when working in often-hostile management or organizational structures:

[UX designer] roles are often misunderstood and our adjacent disciplines such as product management and development see their work as unnecessary or in some cases are threatened by them. [...] We find that the culture of the company we are trying to deploy UX resources into isn’t ready to accept them and we find that our role becomes more that of a change manager than a user experience manager. We have a vision for what the future processes of the company can look like but we find it hard to communicate that vision.... [21]

Design Competence

As we shift our gaze to the individual UX designer, we confront the issue of what constitutes competence in interaction design or UX. A set of competencies that makes someone a good UX designer has not been fully explored in the HCI literature, but has been addressed more broadly in design theory and engineering design [15,19,23]. Gray [13] offers an initial taxonomy of UX competence, drawing on a co-construction of identity between the individual designer and their practice environment. This paper addresses this co-construction more fully, offering a way to map these relationships over time. In design theory, competence has been conflated with expertise [16], but in practical terms, explaining how a UX designer needs to be able to perform in practice, the answer is unknown and likely more complex. One broad view of competence includes “the ability to successfully meet complex demands in a particular context through the mobilization of psychosocial prerequisites” [19] with a focus on behaving in relation to a specific context. Weinert [23] defines competence in a more systemic way as “a roughly specialized system of abilities, proficiencies, or skills that are necessary or sufficient to reach a specific goal [which] can be applied to individual dispositions or to the distribution of such dispositions within a social group or an institution.” In each of these broad definitions, we can see the performance of an individual actor in relation to a specific context, using cognitive skills, social skills, and situated judgments.

A set of competencies has not been explored in the context of UX beyond a preliminary set of *digital design competencies* [2] created for an education context, and focusing on a symbiosis of technical skill and communicative ability. In the corporate context, there has been an increasing focus on hiring “T-shaped” people—a term popularized by Tim Brown of IDEO [9]. According to an interview with Tim Brown: “T-shaped people are individuals with strengths in two dimensions. On the vertical axis, every member of the team needs to possess a depth of skill that allows him or her to make tangible contributions to the outcome. They also need to be able to work well in the messy environments required to solve complex problems. Design thinkers cross the ‘T.’” [9]. All of these perspectives are beneficial as we

discuss how UX competencies are transmitted within an organization, between individuals and groups.

Design Leadership

Another helpful concept when we discuss UX adoption in a corporate context is Nelson and Stolterman's view of design leadership [16]—the idea of being “in service” as a designer, with the goal of exceeding expectations and building communicative partnerships. There is a sense in which a design culture has to exist for design competencies to be asserted, so in places where this culture does not exist, an individual or group must take steps to create one—both for herself, and for the stakeholders and other personnel who are involved in the creation and development processes.

This leadership involves some level of individual belief that “[t]he process of design is always the most effective and efficient means of getting organizations and individuals to new places” and that “leadership is [...] an essential element of any design culture” [16]. Designers must “ask challenging questions,” “never settle for the ‘problem’ as presented,” and “expose the underlying forces of change” [16]. This is a substantial undertaking—and one promulgated by an individual through their competence and performance of their designerly identity.

RESEARCH APPROACH

This exploratory study addresses how practicing UX designers think about competence, and how these expectations of competence change over time in reaction to individual and corporate changes. The primary contribution of this work is to help the research community understand more fully how UX designers are interacting with companies that have limited UX culture—or no UX culture at all—and how the role of UX and interaction design shifts in the organization over time. This shift impacts the training UX or interaction designers should receive, as well as the potential impact UX can have on an organization over time, as bound by the individual designer's sense of identity in terms of UX, and how the organization reacts to individual competencies around UX or interaction design.

We addressed the identification of competence and changes in competence over time through an initial interview study, followed by the use of thematic analysis [10] to construct a schema to explain and discuss the flow of competence. This flow will be explored further through multiple case studies [22], drawn from an additional set of interviews.

Broad View of Designers and Competence

We interviewed six practitioners in a range of design disciplines, most including an emphasis on interaction design, in order to establish a starting point of what designers see as a working definition of competence—in both static and dynamic forms—in their profession. Interviews included discussion of how participants established their design competence, and how they maintain that competence over time.

A purposive sample of designers was created based on a selection of design colleagues from the professional network of each of the researchers. These designers represented a broad range of backgrounds, including graphic design (1), interaction design (3), instructional design (1), and craft (1). Each participant was invited to participate in an interview through videoconferencing software, and all six participants that were contacted agreed to participate. These participants were predominantly male (5), with experience in their respective design field ranging from 5-20 years.

Data Collection and Analysis

Each design practitioner participated in an approximately one-hour interview, exploring the locus or definition of competency in their specific design discipline, and what sources they draw on to increase or sustain that competency over time. Each interview was recorded, with portions transcribed for additional thematic analysis.

We then performed an emergent thematic analysis of these interviews, drawing out themes in two stages. Initially, each researcher analyzed a set of two interviews, identifying potential themes that addressed competence across both interviews, where the participant answered questions based on their own definition of competence. Following this process, we discussed the interview data and reconciled emergent themes as a group, which resulted in a formalization of the original themes. We then reconciled issues of competence in a broader theoretical sense, developing the concept of “flow” along dimensions of awareness and location in relation to the individual to explain the shifts in competence over time that were noted by the participants. The resulting semantic differential was a helpful tool to talk about how designers relate to the organizations they work with, and how these linkages may allow for generative discussion about the role of competence in UX, particularly in communicating the changes in competence and the basis of this change in regard to awareness and environment. This phase culminated in a preliminary schema of environmental or personal factors surrounding competence, and how flow between these factors might indicate more information about the competency building process from an organizational and personal perspective.

Targeted Validation of Competency Schema

We constructed an initial schema of competence that addressed flow of competence over time based on the initial interview results and formal analysis. To explore this schema further and provide some initial validation of its utility and generativity, we requested additional interviews from a new set of UX practitioners using a modified interview protocol that focused on the elements described in our schema. Participants were solicited through a social media group that included alumni working as interaction designers or user experience designers. Three practitioners agreed to participate in the study, all of whom were male. Their experience in interaction design or UX contexts ranged from

two to five years, and all had previously completed a Master’s degree in interaction design.

Data Collection and Case Study Analysis

Each practitioner participated in an approximately one hour interview, which included an exploration of their competency in interaction design, their design process, and what flow patterns indicated from our preliminary schema might encourage discussion of their changes in competence over time. In addition to individual competency, we also addressed broad themes of competency in interaction design, focusing on upstream and downstream flow of design competence in these practitioners’ respective organizations. In particular, we attempted to identify the acceptance of UX and design in these organizations, and how the designer and organization reacted over time to this shift. Each interview was recorded, with substantial portions transcribed for additional thematic analysis.

This second phase was intended as an initial exploration of the preliminary schema, allowing for some of the flows present in the schema to be discussed in greater detail. Because of the richness of this second set of data, we will present these as three case studies, to allow for additional exploration of the individual designer and organization, and discussion of how these unique factors play out in the context of UX adoption and shifts in competence over time. These case studies show a wide amount of variation, a hallmark of a well structured multiple case study [22].

INITIAL FINDINGS AND SCHEMA CONSTRUCTION

We developed our initial findings through an analysis of the interviews with our first six participants. These participants represent a broad range of design backgrounds: one graphic designer/typographer employed as a sign painter; three interaction designers; one instructional designer/software engineer; and one knitting pattern designer/knitting teacher. Based on the responses from these interviews we developed a schema that facilitates a discussion about the competency each designer relies on in her work. This schema is meant to play a descriptive role, with both rhetorical and generative qualities to further communicate linkages between competencies, which existing literature confines to a discussion of individual or organizational competence in isolation. This schema links the two sets of competence together, and allows for a discourse to occur around how these competencies are linked, and how they might shift or evolve over time. Two main dimensions, constructed as binaries, shape this schema and address how the designers we interviewed spoke about their competence and design practices: individual v. group and espoused v. in-use.

Individual v. Group

With this dichotomy, we distinguish between the actions and beliefs of an individual practitioner, and the actions and beliefs of a group or organization as enacted through a living corporate culture. A group can refer to the company the

designer works for as well as a working group of designers or other stakeholders as a subset of the organization. Each designer we interviewed differentiated the design skills and processes they personally found meaningful and those that their company or group emphasized. A productive tension that facilitates reflection on competence, skill, and practice exists between these individual beliefs and actions and the group’s beliefs and actions. We discuss this tension further in the quadrants we present below.

Espoused v. In Use

Here we distinguish between internalized, tacit action—which comprises the identity and latent beliefs of the individual—and externalized, explicit action—which can be seen in concrete action, or what the individual actually does. The tension between the internally held beliefs of the individual or the group, “espoused,” and the external actions of that group, “in-use,” offer an insightful area for investigation that identifies how designers or groups support or fail to support their espoused beliefs with their actions. This binary was also supported by the work of Argyris and Schön [1], which includes the concept of one’s theory-in-use and espoused theory, and inspired the labeling of this binary. A theory-in-use describes what one *actually* does, while one’s espoused theory represents a belief about action, or the explanation that would be provided if one was asked to explain one’s beliefs. The difference between these states—where action does not match up with belief—is another tension that allows us to discuss apparent contradictions between a designer or organization’s externalized identity and their actions.

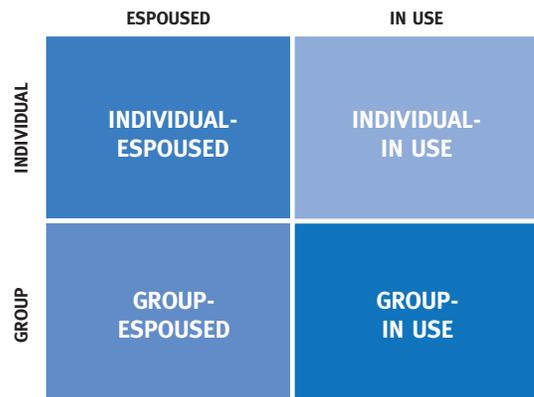


Figure 1. Schema describing quadrants of competence.

Schema Quadrants

The four quadrants of the resulting semantic differential include: individual-espoused, individual-in use, group-in use, and group-espoused. We describe each of these quadrants to build up to a discussion of the flow between quadrants, and how this flow indicates shifts between understanding and performance of competence in design action on the part of organizations and individuals.

Individual-Espoused: competence espoused by an individual
 This first quadrant of the semantic differential describes the tacit understandings or beliefs that exist within an individual designer. It represents the designer’s *espoused theory*—the set of beliefs by which they claim to act upon and that make up their designerly identity [1]. These decisions project who they are as a designer and what they believe it means to practice design and be competent.

Individual-In Use: competence performed by the individual
 The second quadrant describes explicit activities that an individual performs to stay competent as a designer and to perform their identity and beliefs about design, as enacted in the design process. These types of activities, such as keeping up with relevant blogs in the field or purposefully consulting design exemplars, work to create an understanding of other designer’s work as mediated by an individual designer and represent the designer’s theory-in-use. Differences between performance and underlying belief in the individual-espoused quadrant may represent some fluidity in what a designerly identity includes and how an individual acts in a performative way [19] on their identity.

Group-Espoused: competence espoused by a group
 The third quadrant describes what a company or group believes about competence building for their employees, or their beliefs about competence or design. By group we mean the entire organization, a team the designer works on, or any organizational structure in between. These groups tacitly reward certain behaviors in building competence through such actions as spending money to send employees to conferences, through the kinds of deliverables they provide to clients, by what role the organization thinks that a UX person takes on, with a codified design process, by type of project work that is done, or through anything else that looks like a tacit “corporate culture.” This quadrant focuses on the underlying belief or tacit “mental model,” rather than the actual enactment of the belief through performance.

Group-In use: competence performed by the group
 The final quadrant describes the explicit company behaviors that reinforce competence building or assumptions about what competence includes, and in doing so perform the beliefs of the organization or group. These activities, such as attending conferences relevant to professional practice or presenting certain deliverables, represent the group’s engagement with the practice community. As with the individual-in use quadrant, we may see a contradiction between tacit beliefs and actions; for instance, a company might say they believe in a particular design process, but actually perform or reinforce the design process in a different way.

Flow of Competence

The discussion of these binaries allows us to start discussing the ideas behind competence in UX in a more generative way. Rather than only addressing how competence is enacted or sustained on an individual or corporate level in a

static manner, we can also see how these “states” interact with each other through discrete performances or over time. This flow of competence over time is one of our primary contributions, addressing a lack of integration in the literature. Researchers have talked about aspects of organizational and personal competency in the past [e.g., 20], but rarely do we see how these perspectives relate to one another. In particular, the relationship between an individual designer and an organization can be explored on two levels: the tacit assumptions of a designer or organization, and the external actions that conflict or concord with tacit assumptions. In this paper, we will use this flow and related schema in a rhetorical way to allow insight into how UX is adopted on a company level, the ways that an individual designer with their unique perspective affect this adoption, and the role and affect of the individual designer in this adoption.

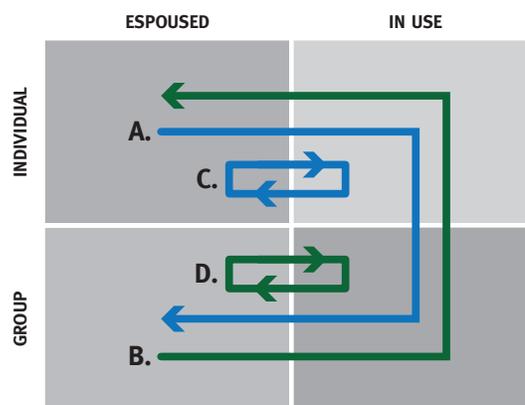


Figure 2. Schema describing the flow of competence.

A set of movements (Figure 2) will be explored in more depth through the case studies, but will briefly be described here. We propose four primary types of flow, two of which represent internal reflective actions on the part of an individual or group, reinforced through performance (C and D). Two other types of flow represent shifts in competence between an individual and group, representing how an individual designer might shift a group’s way of thinking and acting (A) or how a company culture might alter an individual designer’s sense of identity and practice (B). No interaction is represented directly between the individual-espoused and group-espoused quadrants, because we propose that all shifts in competence take place through performance of beliefs, as enacted through explicit action. In other words, no flow directly between an individual and group’s mental state is possible; only enactment of one’s espoused theory through language or action allows for change to occur.

THREE CASES OF UX ADOPTION

To facilitate a discussion of the initial competency schema, and the associated flow between quadrants, we present three different cases of competency and design leadership in UX practice. These cases demonstrate a range of UX

adoption in the field from practitioners with two to five years of experience as interaction designers. A range of status of UX adoption and design culture can also be mapped, with two participants representing companies with a more design-inclusive or “design first” culture that has shifted over the past five years, and one representing a company that is just beginning the transition from an engineering dominated corporate culture.

For each case, relevant details about the individual designer and company will be presented. We will then discuss the kinds of individual competencies they bring to the company, ways they have shared competencies with others, and the ways they attempt to sustain their competence over time. Finally, we will highlight some of the flows of competence exemplified by each designer and company, demonstrating how they have impacted their corporate culture (or have been impacted) in terms of adoption of UX or design practices. This may include any ways their environment has shifted the way they practice design, and the kinds of activities that bridge or facilitate the flow of competence.

Evolution from a Nascent to Developed Design Culture

Peter has been employed by a large educational software and services company for the last five and a half years and works with a team of UX designers. He has a background in instructional design, and brings this perspective to his current work on technological systems for assignments and to-do lists used by high school students and teachers.

He has shifted from a process dominated by paper—including sketches, whiteboarding, and paper prototypes—to largely digital methods of production, using Adobe Fireworks, Adobe Ideas on the iPad, and use of the Twitter Bootstrap framework. Peter recently transitioned to a new framework, and uses a wide range of tools for collaboration, brainstorming, and other design activities.

Individual Competence

While Peter doesn’t feel as competent as when he left his formal education, he thinks that beliefs of self-competence—often linked with his confidence as a designer—have been replaced by experience. “In place of that confidence has come so much experience that I can draw from, and that experience is what gives me the strength that I have to continue moving forward and progressing with my ideas.” He doesn’t rely on his primary job to fill his needs to sustain or build competence, but rather builds these abilities through side projects with fewer political agendas to address, “work[ing] on things in the way he thinks it is appropriate.”

To stay current, he reads blogs and books, and tries to stay aware of new technologies and applications, trends in visual design, and newer methodologies for user control. Much of this awareness is accomplished through a network of fellow professionals in his home city, who hang out at a “speak-easy” which Peter describes as a “moose lodge for design-

ers and developers.” He also locates materials through Twitter, and the broader community—“the world around us”—not just relying on fellow designers to get inspiration. He tries to reflect on his changes in competence over time, engaging in outside projects to keep a balanced perspective.

Sharing of Competence

Recently, Peter’s company has hired a Chief Experience Officer (CXO) to oversee design processes and create a new culture of design. Although this is currently the most dominant force in moving a design culture forward, individual efforts within the company go back to when Peter first started as an employee.

When he was hired, he was the only professionally trained designer, and had to work with others who only knew how to copy existing interaction exemplars; he wanted them to be able to not only copy existing materials, but also to understand why they worked. Since he felt an inability to directly teach these skills, he followed the path of his formal education, and asked several of his colleagues to read Don Norman’s book *The Design of Everyday Things*, with an eye toward implications for design. This effort started the process toward creating a culture of design conversation in his department, and ultimately “pushed a desire in people to know more than they did previously.” This grassroots work to create a design culture eventually coincided with shifts in the executive team, resulting in the hiring of a CXO, the development of cross-functional teams, and ultimately, more opportunities for collaboration.

Flow of Competence

The company Peter works for has gone through a dramatic transformation in the past five years, due in part to the design community he helped to create, in conjunction with high-level executive changes. In this way, we see a flow initiated by the company (B and D) in response to shifts brought about by individual designers like Peter (A). While this was not a fully coordinated transition to a top-down design culture, there was awareness by the incoming CXO that a design community already existed, and the CXO chose to validate that community in important ways.

Peter saw a significant link between his UX competence and his confidence as a designer, which may have reinforced this transition to a design culture. This was manifest through conversations with individuals and a willingness to engage the lack of an existing design culture, both on a personal level (C) and as an impact on the group he worked with (A). Peter reflects on the delicate balance of impacting an organization while also recognizing your own personal limitations and blind spots:

[Confidence and competence] quite literally go hand in hand. [...] when I came out of school, my realistic competence level should have been [lower], and I was way up here [higher] [...] and I pissed people off. I’d get into these conversations with people and really

push the envelope, saying ‘you know what, we aren’t meeting the needs that the users have’ and all of the things that you know are true. [...] competence comes in when you understand why it’s not possible.”

Designing in an Engineering Culture

Martin has been employed by a large technology company for the last year as an Interactive Design Engineer. His title belies the engineering focus of the company, even as they have made substantial shifts toward implementing design practices in the last five years. Prior to joining this company, Martin worked in a research laboratory, a startup, and completed an internship with the same technology company with which he is now employed.

In his work, Martin focuses on “pure interaction design wireframes,” with no substantial user research or responsibility for the implementation of design or problem scoping on a larger scale. These wireframes focus on “feature level design” including labels, error messaging, and other interaction. He works with three other designers in a non-management capacity; these other designers come from a print or visual design background, and he feels that they generally fall into the “classic pitfalls of interaction design” due to their lack of experience in more strategic design roles. He does feel that his coworkers are good visual designers, but “unfortunately, we don’t do any visual design.”

Individual Competence

Martin uses a variety of methods to maintain competence in his work environment, including: reading professional blogs, interviewing with other companies, and networking with designers across his company in informal contexts. He has a “set of blogs that [he] look[s] at everyday at lunchtime”—with blogs ranging from UXBooth to UX Matters to Smashing Magazine, representing a “broad pulse on different components of what I do.” There are a number of pockets of designers in the company, but little organizational structure to tie them together. Because of this distance between groups, designers “are making efforts to reach out to other design groups and discuss process and find common ground” through “fireside chats” held every Friday, which are open to all designers in the company. This is a more recent phenomenon, with one of Martin’s colleagues responsible for getting it started the month prior to our interview. They use this time to do “design decompression” and bring materials to critique or talk about.

Martin brings a strong competence in systems thinking to his team, which is beneficial because the company “design[s] with a lot of elements or components or attributes” which are complex and “carry a lot of embedded meaning.” This competency is not shared with his other team members, who are unable to “weave a golden thread through all of the components in a particular assembly.” He also adds an ability to understand and communicate critique and feedback to a variety of stakeholders, using his more systemic view of design to manage the overall design of a product.

Sharing of Competence

Martin actively shares his individual competence with his group of coworkers, and is also working with local designers in an IXDA chapter that is in the process of starting up. In the department where he works, “one of the biggest challenges [...] is that [his] manager has no idea what UX is.” As a result, he has taken it upon himself to share materials with his colleagues, including books and articles from blogs he reads. He has also begun to mentor one of his colleagues in a more specific way, directing her towards a MOOC on UX offered by Stanford, and through a weekly meeting to “critique her work and give her a better understanding of HCI principles.” He also sends out bi-monthly “Cliff’s Notes” on UX methods, “trying to get the team a better understanding of the different avenues we could employ to improve our work.” His work is also evident in the formation of a local IXDA chapter, which helps Martin further his competence—promoting design activities outside of the narrow constraints of his workplace. He feels that it is “important to have a wide variety of projects [...] to keep yourself sharp and thinking appropriately,” and that he is actively concerned about keeping a “contemporary process.”

Flow of Competence

The company where Martin works is actively going through a transition to a more designerly culture. He notes they are “very open” to this transition—an openness to flow from individual to organizational competence (A)—but they are also unsure how to promote organizational change:

“Their approach is—we know we need you, but we also need you to teach us what you do and we need you to teach us how to facilitate what you do. It’s a lot of education to stakeholders about what it is you do because no one here really knows about it. It’s very distributed and I don’t think they can look at it from the same position that someone like myself can look at it and see that all the pieces are there and everything is going on but it’s just fragmented, it’s a little bit disjointed.”

Even while Martin’s company is open to change, he reports that he has changed his approach to design “drastically” since joining the company last year—a shift in individual competence based on the espoused and in use theory of the organization (B). Many of his colleagues have worked at the organization for 20-25 years, and “it took [him] a long time to trust them and trust the information and rationale they provided, because they were not explicitly validated or justified.” Over time, he learned to “[stop] asking those questions and rely on a little bit more faith. Whether it’s right or wrong really isn’t in my control. I had to let go of that.” This evolution has affected his individual identity as a designer, showing a flow from organizational to individual competence (B), and an iterative reshaping of process between espoused and in use competence (C).

Ultimately, this shift in company culture affects everyone—both designers and engineers. Martin explains “there are a

lot of career, highly decorated engineers that now have to deal with people telling them how to design their product, and it's challenging." While this shift is happening on the individual level, there is also a lack of direction organizationally, because "a lot of employers out there don't know what they need. They have no idea how to evaluate a designer's skills in order to assess the compatibility of that designer for that position." Martin has come to the conclusion that "the responsibility is on the designer to fit themselves with the business, rather than the business trying to fit a designer, and find one that fits them," clearly privileging competence moving from the organization to the individual (B) rather than altering the organization himself (A).

Pushing Design Culture Forward

Joel works for a small software company that creates solutions for non-profit organizations, and has worked as a UX Manager for the last five and a half years. Currently, his work is primarily management focused, with design tasks including conceiving, direction, and prototyping. The company has grown significantly since he joined the company, with more geographic distribution of employees, and over 100% growth in headcount. Joel works directly with six individuals in a team, including management.

Because Joel's work focuses on management and direction of tasks, he relies on ways to quickly communicate to his team members: "Sketching boxes and arrows. [...] It's meant to convey a concept so you can get that in front of users immediately." He also frequently creates quick paper prototypes or digital wireframes in Fireworks, but ultimately does research "by showing people sketches" along with more established methods like contextual inquiry.

Individual Competence

Joel uses a number of different strategies to stay competent over time, including regularly visiting professional blogs, exploring and "doing stuff," and focusing on a subset of skills within the broader context of UX. He reads a wide range of blogs, including Smashing Magazine and UX Matters, following the death or slower production of articles from powerhouses like A List Apart or Boxes and Arrows. But he is "more curious about what people are doing outside of design," looking at psychology, information architecture—things "we can learn from in UX, rather than focusing solely on UX. The UX community tends to be an echo chamber, and if you don't try to go outside of that, you're probably doing yourself a disservice in terms of education." Joel also focuses on actively exploring to learn new things: "The way they learn a prototype [...] is to have a project that forces you to learn the things you need to learn"—this is not accomplished through a lot of training or reading books but "just start doing stuff." Finally, Joel focuses on a small subset of the overall discipline of UX as he sees it. UX might have a dozen different facets, including: research, visual design, interaction design, information architecture, translation to stakeholders, strategy, etc. This

diversity is "part of what makes UX an interesting field" and allows him to recognize where his interests are, so he can build those skills further. He is more focused on this holistic notion of his design identity as a UX designer rather than defining himself by specific tools or abilities: "UX designers can learn a tool like Axure in a weekend. I like to just be aware of what's out there instead of know how to use all of the tools."

Sharing of Competence

Joel has focused on sharing informal knowledge about his craft with colleagues since he began working at this company, and runs a "cultural initiative" to do education within the company, which focuses on swapping skills between those who have them and others that need them. He began this initiative around five years ago "because the design team here was terrible and we didn't have interaction designers." This education initiative was initially a move of self-preservation to "keep people from saying we don't want interaction designers," but has since grown into a design culture with rapport between colleagues. Beyond this more formal cultural initiative, Joel also created an informal blog to share interesting readings and tools—this blog was originally begun five years ago, but has been especially active as the design culture has increased in the last two and a half years. The company also provides a framework for sharing and building competence outside of the formal design environment, hosting an "off the grid" day a couple of times each year, where teams can "design and build and QA a feature of their own choosing."

Overall, Joel has led in the building of competence by example, focusing on collaboration, communication, and active reflection on process, and continually "espousing these values to [his] team." The most substantial message that he tries to communicate to his colleague as he helps them increase their competence is that you have to be "utterly confident about what you're doing while at the same time willing to admit that you're completely wrong."

Flow of Competence

While this company may have started as less design or UX-friendly, Joel has actively worked to shift the culture of the organization with a remarkable level of success. Instead of a gradual evolution toward design culture in UX, he pushed the company by redefining what UX could offer them, and "change has happened pretty quickly." In this way, the primary flow is from individual to group competence (A) with a substantial component of individual and group reflection (C and D) to bring about lasting change.

Joel accomplished this shift by initially "refus[ing] to do things [he] didn't think were interaction design," working with a team to help his colleagues understand the value of UX and his approach:

"I could either leave or I could make the best of it. [...] Looking back at it now, it seems kind of ballsy, 'cause

now that I'm at this point in my career, it looks like I had a chip on my shoulder. The key to doing things like this is always to be tactful. [...] I'm not going to do this, but what I can offer you is this other thing that's hopefully going to get you to the same place."

He focused on not only building UX competency within the organization and helping his colleagues understand the value he could bring to products, but also on building collegiality amongst his team—"The rapport you have with your team is one of the most unsung aspects of software development." This was a challenge, since his manager "initially [...] didn't understand what the field was about" and he had created a few enemies along the way. But in the last two years, two new vice presidents have joined the company who were sympathetic to Joel's perspective, and as a result, "our whole understanding of the discipline is so much better. [...] Having those people has really been integral to helping me push that agenda forward." In this way, Joel was able to focus on moving expectations of UX competence on several group levels (A), as well as helping to create a lasting reflective conversation within the company about the value of these new approaches (D)

Lasting change has happened in the company, and colleagues have started to approach UX in a positive manner. Joel relates an experience going out with his manager for a beer recently, where the manager said: "When you used to talk about UX, I thought you were full of shit. But now I actually believe what you do is valuable." The value to the organization was the most important factor: "results are what's important, because what they see is better products and they see customers that are happy, and they say, you know what, it wasn't just about giving them these features, it was that these features were designed well and we gave them the right things." This push results in often having to "fight to make sure your designs are implemented as you designed them" and constantly selling your approach (A). Early on, he was able to push designs through to show successes, but "lost a lot of battles" in the process (B).

DISCUSSION

As we have explored three specific implementations of UX, using our preliminary schema (Figures 1 and 2) to map the flow of competence between individuals and groups, there are a number of emergent issues relating to UX adoption that are important to discuss further.

Design Leadership in UX

As Nelson and Stolterman point out, "leadership [...] is an essential element of any design culture" [16]. In the context of UX, this design culture does not autonomously spring to life in a company. Formation of a design culture requires persistence on the part of an individual designer (or a group of designers)—an effort to promote UX practices to stakeholders and/or management. Over time, and sometimes in synchrony with changes in executive perspectives, a design or UX culture can take root, as in these case studies, but

establishing this culture can be quite difficult, and can take several years and a confluence of factors to begin to thrive.

Design leadership also includes efforts to upskill designers that are already in place, and in the cases described here, this was where the process began—in creating a shared design culture among colleagues. Since many practicing UX designers were trained in other areas, or migrate into jobs that have a partial UX role, there seems to be a significant element of on-the-job training that facilitates sharing of a core set of skills. In these cases, it was less about tool knowledge (e.g., wireframing) and more about creating empathy with the user, strategically transferring that perspective into designs that could be communicated to stakeholders. Educating both colleagues and the stakeholders about the capabilities of UX, and building competencies for delivery and sustainment of UX principles appears to be key to a culture of UX taking hold.

Factors Affecting UX Adoption

There are a number of factors that stand out as important to UX adoption, based on traversing flow in our preliminary schema, exemplified through these three case studies. All participants found success through a dual strategy of actively evangelizing UX practices to stakeholders, while also teaching these practices to their colleagues. In parallel with these strategies to share competence with their team or company, there were also ways these individual designers maintained and increased their competence: reading professional blogs and books, attending conferences, finding opportunities to practice "blue sky" design and encourage creativity and innovation outside of their normal work constraints. There was also a powerful component of these designers' activities relating to communication and articulating UX practices in a form palatable and/or understandable to key stakeholders or executives. Success in translating engineering cultural norms into UX cultural norms or demonstrating the effectiveness of UX practices through successful projects seemed to be key in creating a shared conversation, and ultimately, a fledgling design culture.

Flow of Competency

Both design leadership and factors surrounding UX adoption can be framed within our preliminary schema (Figures 1 and 2) as a flow between stakeholders and an individual designer, and along a temporal dimension as well. When we are able to understand how competence shifts along these dimensions, both internally to a designer and externally to a larger group (with all of the component movements between states that are implied), we will have a greater understanding of UX competence *in situ* [14], which will lead to documentation of effective adoption strategies.

As we continue to address the development of competency, often discussed in an educational framing, and sustainment of competence, often carried out in a professional setting, looking at how these competencies are *performed* can be instructive. In particular, it is vital to address the latent

states between performance and adoption, especially where beliefs and actions are incompatible or in tension. This underlines the importance of understanding an individual designer's identity, and how that development occurs in tandem with their surrounding corporate culture [13], and how this development might indicate flow of competence bi-directionally [14]. Additionally, the experiences of the participants we described promotes ongoing reflection, often on a metacognitive level, about design practice. This reflective conversation allows for beliefs (espoused theory) and performative action (theory-in-use) to become more aligned, both on the individual and group level. This framing of competence as a flow over time and between individuals and organizations opens up a wide range of future work for HCI researchers, including exploration of successful UX adoption strategies, methods for informally and formally educating practitioners, and successful approaches to articulate design concepts or issues to non-designers.

CONCLUSION

We have introduced a way of reframing the idea of UX competence within the context of corporate adoption, focusing on the experience of the individual designer, and the potential impact a sharing and shift in competence over time can have on the organization and the individual designer. Our preliminary schema allows us to trace the flow of competence between the dimensions of time, group/individual, and espoused/in use, focusing on the performative aspects of competence as a form of design leadership. The schema allows for additional discourse on these key tensions between individual and organizational competency, informing future research by enabling a better understanding of the practice community.

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