Infusing User Experience into the Organizational DNA of an Enterprise IT Shop

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Abstract. This case study describes how an enterprise IT user experience (UX) group evolved from its genesis as a tactical, backend fixer of usability issues to a strategic partner within a large IT department. We share specifics as to how UX emerged as a skillset, how UX professionals evolved their methods to increase their effectiveness, and how operational changes facilitated the adoption of UX practices within the corporate IT shop. We detail how data-driven UX decision-making was essential in transforming the traditional IT shop into a more user experience driven organization that better understands their target workforce and uses this understanding to set product strategy for the organization and drive strategic improvement of IT solutions. Learnings and insights from this journey provides guidance to others wanting to maximize the value of enterprise UX investments.

Keywords: User experience · Enterprise IT · UX decision-making · Big data · Thick data · UX metrics · Organizational transformation

1 Introduction

Today's enterprise experience is increasingly complex both for users and the IT shops that support them. This experience is fragmented across multiple devices, platforms, new enterprise products, legacy systems, and a multitude of vendors. In the course of daily work, users must often switch between very different interfaces and often times serve as the human glue connecting disjoint information systems. The fragmented experience leaves users frustrated and less efficient while also slowing the speed of business.

This fragmentation of the enterprise experience also requires that IT shops support a great many more products than they have historically. IT shops often find themselves consumed by the day-to-day challenges of keeping their diverse product portfolios running and keeping up with the latest technology, leaving them little remaining bandwidth to even consider the experience of their users. This fragmentation is exacerbated by the number of IT teams that are needed to develop and manage the enterprise experience. In a large enterprise such as ours, it can take many dozens of

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teams around the globe. Often times despite the interdependent nature of these functions within the enterprise, the teams supporting different elements operate in deep silos, independently of each other, and with little awareness of how individual pieces fit together to shape the enterprise experience.

Today's enterprise users are increasingly expecting their enterprise experience to be as easy-to-use as their consumer experiences. They have easy access to a multitude of web-based, external products that allow them to bypass IT regardless of whether the externally offered product complies with corporate information or security policies – potentially putting the corporation and its intellectual property at risk. This practice is often costly, and corporate mandates do little to stem the tide of external products into the enterprise environment. As a result, IT shops are increasingly turning to user-centered approaches as a means of improving user productivity, increasing business velocity, and in general making enterprise solutions more appealing to users. However, these practices run counter to the technology-centric, one-size-fits-all, and business-centric approaches of traditional IT. Further, UX and IT professionals use very different languages to describe the enterprise and significantly different methods to evaluate enterprise health which hampers the adoption of these user-centered approaches within most IT shops.

This paper describes the journey of one enterprise IT user experience group from its genesis as a tactical, backend fixer of usability problems to a strategic partner within IT that is transforming the holistic enterprise experience (i.e., the cumulative experience that results from using the many IT products and services). Recent years have seen user-centered shifts in how the corporate IT department delivers products and services resulting in changes across the organization. We will share learnings and insights from our journey for others looking to transform the enterprise.

2 The Journey to Strategic UX

This work takes place within the context of a large corporate IT shop that employs over 6000 individuals at 59 different sites around the world and supports over 102 K employees in 63 countries using over 160 K devices including over 53 K handheld devices. Its mission is to grow the business through information technology by increasing employee productivity and driving business efficiencies and growth, while delivering IT efficiently, securely, and with agility.

The journey to UX began with the creation of a central UX function in 2005. At first, the UX function focused mainly on tactical "catch and save" activities with projects, such as usability testing and enhancement of existing applications. Typically, we worked alone on an individual project and were the sole proponent of UX within the project. Arguments for UX often centered around its inherent goodness rather than business value so while UX was seen as important, it was not considered essential nor did the UX professionals within the group have sufficient understanding of the "business" of IT to position themselves more effectively.

Before we could start carving out a space for UX within the larger IT landscape, we had to transform ourselves from a group of UX zealots to a team running a UX business. Fortuitously, we were led by a seasoned IT professional who, while not a UX

expert, could clearly articulate the potential value of UX to broader IT and help the group more successfully articulate its value. This guidance helped the team gain greater credibility within IT as well as increased business acumen. Simultaneously, we were coalescing as a team and developing more efficient ways of working with each other. Outside of project work that made up the bulk of UX activities, we focused on defining robust internal processes that mapped UX deliverables against the product lifecycle, developing standard templates for UX deliverables, creating a central UX repository, and designing a group portfolio.

By iteratively refining our processes so that we could work more effectively together and better fit the larger IT organization, we were able to repeatedly demonstrate high quality, reproducible results that tied to our core value proposition. Namely, by adopting a user-centered approach to delivering IT services, IT solutions could be optimized to improve employee productivity and increase business velocity by

- Aligning products to actual usage,
- Increasing user adoption of solutions,
- Reducing development rework,
- Delivering a consistent user experience, and
- Increasing user flexibility and choice

These optimizations minimize user issues while reducing development and support costs. In the process and over time, we arrived at a core set of UX services that enabled us to influence all levels of service decision-making and demonstrate business value.

2.1 An Evolving UX Services Landscape

In the years since the team's original inception, the scope of UX services offered within IT have grown to include

- Project support focused on a specific product,
- Enablement work focused on growing UX skills within the larger IT shop (e.g., training) and UX governance (e.g. UI standards),
- Satellite UX capabilities that over time grew within IT as part of the central team's growth of UX capabilities across IT,
- Metrics development to better assess the extent to which users found IT products and services usable and useful,
- Research transformation to provide a deep dive, front-end look at what users need prior to project and program definition, and
- Design innovation to look at experience possibilities prior to program or project inception.

Figure 1 shows how staffing of these different UX activities evolved over time and highlights the evolution of the UX capability within the corporate IT shop. Specifics of how each helped weave UX into the corporate IT shop's organizational DNA will be discussed in greater detail in the following sub-sections.

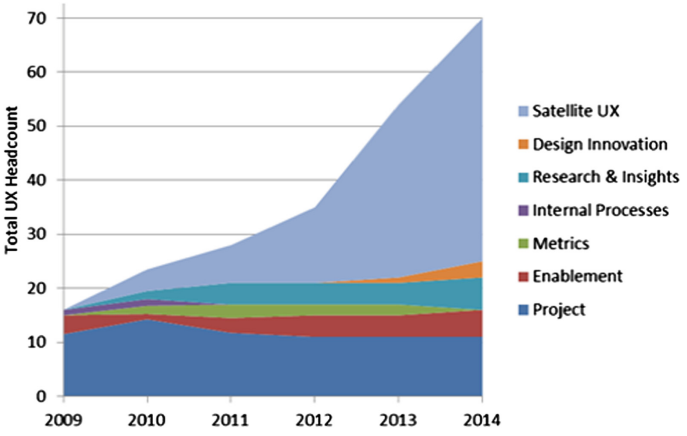

Fig. 1. Shifts in UX services staffing over time

2.2 Growing UX in the Workforce

Growing UX Skills. Faced with the reality that our numbers would never be sufficient to cover the plethora of enterprise products and projects, we tried to extend our reach by providing ad hoc training to members of the teams that we worked with. The training was targeted at a specific skill needed for a UX project deliverable (e.g., how to run a usability test). It helped us extend our resources and helped project teams gain new insights about what UX offered. As training was often developed on the fly and in response to a specific project need, it often required extensive updating for use in a different space. By 2011, our training approach had matured and we began

- Formally tracking ad hoc UX training,
- Standardizing training for common UX tasks (e.g., how to interview users), and
- Using foundational training to increase UX awareness and appreciation.

The training was mapped to corporate human resource competency areas for the UX job roles, which enabled job roles with skill affinities, such as software developers and system analysts, to target specific skill areas within our primary competency areas. Table 1 shows the evolution of IT job roles over time.

We also offered coaching by UX professionals and a "brown bag" series for practitioners that focused on topics related to the challenges of introducing UX methods into IT projects. To further speed the growth of UX within IT, a virtual Community of Practice was created to maximize IT engagement, foster UX collaboration, and cultivate emerging UX leaders. The online forum became the focal point for IT employees to learn more about how to integrate UX methods into their work practices and enable positive user experiences. With more than 3000 visitors in 2013, it provides one-stop access to IT UX resources and specialized UX communities (e.g., user research).

In 2012, we also began offering a formal apprentice program to train selected participants from IT groups with the aim of infusing UX practitioner skills across IT

Table 1. How IT roles transformed with the institutionalization of UX within the enterprise

IT Role	UX Focus Areas
Training, Quality Assurance	Usability evaluation of products and services
Business / Systems Analyst	Project UX practitioner on low to medium risk efforts
Program / Project Managers	Make UX part of decision-making, set UX goals, and plan for UX deliverables
Portfolio / Service Owners	Define UX roadmaps and make UX part of decision-making
Software Developer	UI design practitioner on low to medium risk efforts
UX Professionals	Business savvy UX architects and strategists on high risk efforts; UX coach for other roles

projects. In its original form, it was an intensive undertaking for the IT apprentices that required weekly classes and out-of-class work. Apprentices also had to pass a final exam. While those succeeding became successful UX practitioners, the drop-out rate was a whopping 61 %, largely due to competing job demands. To decrease the dropout rate, we shifted to self-paced learning and quarterly opportunities to demonstrate UX competency thru rigorous portfolio review, testing, and interviews. We also provided ongoing "office hours" where IT practitioners could just drop-in for advice and coaching from a UX professional.

We have found these approaches are successful at infusing UX into the workforce as long as there is the underlying UX skill affinity for the individual and organizational commitment within the parent IT group. However, even with that, it takes both time and money to grow UX skills as shown in Fig. 2.

Growing Satellite UX. With the increasing visibility and success of UX within IT, a hybrid staffing model emerged resulting in a distributed community of UX practitioners and professionals across the key IT divisions. These "teams" typically included a mix of local UX practitioners as well as UX resources from the central UX group. Often times, satellite UX was a by-product of previous large-scale UX initiatives that yielded significant business results. These initiatives were often a catalyst for the up-levelling of UX skills among local IT professionals who served as UX practitioners and took on more tactical UX responsibilities during the original work. The practitioners were typically used to supplement the skills of UX professionals. In a few cases, IT divisions hired UX professionals to drive UX strategic initiatives for their domains.

The growth in satellite UX was often accompanied by the emergence of a UX "champion" or evangelist within the division. Typically senior technical folks or mid-level managers, these champions were key allies for the central UX team and centers of gravity for UX work occurring in their area. In 2012, this loose network of UX champions was formalized and became an advisory council for the central IT group as well as local leaders of UX within their division.

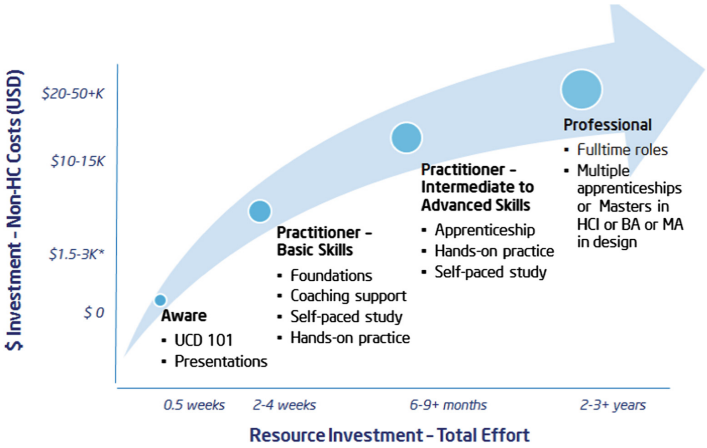

Fig. 2. Investment required to shift IT professionals to given levels of UX skill

2.3 Motivating with Metrics

Like many companies, as a way of motivating UX involvement and demonstrating the impact of UX activities, we developed a core set of metrics that could be applied across IT products and services [1]. They range from an upfront needs assessment to our Voice of the User survey, a yearly look at overall user satisfaction with delivered solutions. This common set of metrics allows the organization to reliably compare the UX of different components of the enterprise experience. Passing "grades" or scores are defined for each metric, providing shared UX expectations across the enterprise.

UX Risk Assessment. Earlier work found that re-framing usability in terms of risk management helps managers see the benefits of usability and helps usability gain traction in an organization [2]. This perspective speaks to core IT concerns and spurs IT to think about UX in terms of the "risk that the project will fail if you don't". The *UX Risk Assessment (UXRA)* looks at project risk relative to

- Number of users,
- Business criticality of user tasks,
- Magnitude of user experience change,
- Complexity of user workflow,
- Frequency of use,
- Level of ergonomic risk, and
- User satisfaction with existing solution

The UXRA generates both an overall risk score as well as prescriptive guidance for mitigating UX risks. It has evolved into a UX needs analysis for new projects, provides the UX organization with a way to compare projects, drives UX resourcing prioritization, and is mandatory for all new projects.

The IT Usability Scale. The IT Usability Scale (ITUS) is a four-item, Likert scale that assesses a solution's perceived usability [5] by having users rate whether

- [This solution's] capabilities meet my requirements.
- Using [this solution] is a frustrating experience.
- [This solution] is easy to use.
- I have to spend too much time correcting things with [this solution].

The ITUS was created to provide results similar to those obtained with the longer 10-item System Usability Scale [4], and was organized around the ISO 9241-11 definition of usability [9]. It is required for any project assigned UX resources and provides both a baseline and a post-deployment assessment of usability improvement.

Voice of the User. *Voice of the User (VoU)* is a yearly look at how well the collective IT experience satisfies employee day-to-day needs. It was originally conceived to connect user feedback to IT strategy and was designed to provide metrics to motivate experience improvement [7]. It assesses

- Overall satisfaction with the IT Experience,
- Overall satisfaction with how IT products and services enable core employee tasks (e.g., collaboration, information finding), and
- User satisfaction and perceived importance for individual products (e.g., employee portal, search, mobile apps).

Timed to coincide with the IT financial planning cycle, VoU became a tool for IT leadership to identify products and services that were most in need of UX improvement and funding in the coming year. We have linked responses of individual users back to their actual usage of IT products and services, which has allowed us to build models of how product and support use relate to satisfaction with a product and overall IT.

2.4 Infusing UX into IT Governance

While increasing UX awareness and skills within the parent IT organization and providing metrics helped improve individual products, it did little to help align the individual experience. Like many IT shops wanting to give users a more uniform experience, our group defined interface standards that prescribe color schemes, fonts, layouts, and the like. Built on a foundation of industry standards (e.g., ISO 9241-11), we increased their relevance by incorporating corporate brand standards and increased utility by combining them with re-usable interface assets (e.g., design patterns, re-usable code units). The resulting set of collateral cover

- General look and feel across platforms (*e.g.*, icon libraries, interface guidelines, design patterns)
- Platform specific guidelines (*e.g.*, Employee Portal, Business-to-Business portal)
- Application specific guidelines (*e.g.*, mobile apps, touch guidelines)
- Vendor specific guidelines (*e.g.*, SaaS solutions)

We increased their usage by making them part of IT governance and creating code libraries that streamlined development. While this governance was successful at taming the visual inconsistencies within the IT environment, they did little to address the functional inconsistencies between products or to ensure that the cumulative experience was a coherent one for our users.

2.5 Seeding Experience Transformation

While the previous efforts were instrumental in making incremental improvements in a product or service, they were insufficient to seed the entrepreneurial type thinking needed to transform the enterprise experience. Historically IT organizations focused on corporate total cost of ownership (TCO) often at the expense of the individual user efficiency. Conventional IT thinking was that there was always a trade-off; you could not have both and TCO would always trump in the long run making user-centric transformation unsustainable.

We recognized that any large-scale and sustainable transformation of the experience meant transforming organizational thinking about IT users. While we identified early on the potential transformative aspects of the large-scale UX work we discuss below, we didn't expend energy trying to talk about it in larger IT until we could demonstrate its impact. Instead we focused on engaging with organizations where there was pull and potential value in large-scale experience transformation.

Seeding Experience Transformation with Research. Most UX professionals perform user research in some form or another—typically at the start of a project or program. However, by waiting until project inception, user research often has little impact on larger IT strategy. So, early in 2008, we shifted our focus to transformative research that occurred before a project or program began and had the potential to transform both the experience and the enterprise. For instance, when creating new business-to-business services, or transforming core enterprise functionalities.

Collaborative Research to Seed Understanding and Empathy. Underlying our approach was a more collaborative, action research-based model [8]. In keeping with the tenets of process consultation [14] our approach was based on the belief that neither our IT clients nor the UX team knew enough initially to identify the "right" solution. Instead we partnered with the client to jointly identify the "real" problem and discover solutions that fit the client environment. Sociotechnical systems theory and macroergonomics served as the underlying theoretical model for understanding the data gathered through the collaborative process. They have been used successfully in earlier work to holistically assess how well a technology fits its users and their work environment in relationship to enterprise priorities [10, 12]. They are especially appropriate for examining the user experiences within the enterprise, as success requires IT to understand how their "technology" impacts other elements of the user's world.

We also focused on understanding the organizational beliefs and constraints that shaped the original experience. We spent substantial time packaging the user story in innovative ways to bring the story to life for the organization and help make it "sticky" to the organization. Success required organizations to think differently about the user and grow an organization-wide commitment to solving user problems.

We found that the collaborative process shifted the focus of power for the user experience, and often resulted in discomfort among key decision makers. The more collaborative approach was also often uncomfortable for some UX professionals who saw the process as ceding some of the power of their expertise and sometimes requiring them to give up something methodologically for success. By adapting our research methods to the situation at hand and carefully looking for opportunities that allowed us

to influence IT strategy, this process seeded experience transformation, shifted organizational beliefs about the utility of UX, and shifted our own thinking about how to incorporate UX practices in the enterprise. It also typically spawned a series of impactful UX projects that brought the potential of the research to life.

Integrating Big Data and Thick Data to Frame Enterprise-wide Transformation. Corporations collect a wealth of operational data about enterprise users. IT organizations invest heavily in managing and storing this so-called "big" data, in hopes that it can be analyzed to reveal patterns, trends, and associations that might benefit the business. It can also be a rich source of information about user behavior. It excels at fine tuning the delivery of an enterprise experience. For instance, enterprises can use the data to identify problems by looking at support tickets and then fix the problems before a major escalation or serious user incident occurs. However, big data is fundamentally a backwards look at the enterprise; it lacks the qualitative insights that tell the organization why the behavior happened or the context in which it happened.

Fortunately, where big data falls short, more traditional UX methods excel. These methods yield qualitative information that provide the enterprise with granular, specific data about enterprise users that allows IT decision-makers to understand user behavior and adapt IT strategy to better meet user needs, and increase enterprise velocity. This so-called "thick" data is often in the form of user narratives or user observations [16]. These "stories" of use can come from many sources including interviews, observations, social media, participatory design sessions, or open-ended comments on surveys. Often times this data is elicited using small numbers of users using sample sizes that puts their generalizability in question in the eyes of IT decision makers. Further, even with careful curation and management, this data can be difficult to re-use outside of the context of the program or project in which it was gathered.

By growing connections between the massive amounts of operational big data in the enterprise and the thick data resulting from direct research with thousands of employees, we could blend the multiple types of data [11]. It required that we manually code the user stories to create a coding structure that represented the users' over-arching mental model of the enterprise experience [3, 15, 17]. We let the user stories guide the coding but made sure to code certain attributes related to our underlying sociotechnical model including specifics of the user activity, whether the story illustrated a positive or negative incident from the user perspective, underlying technology, environmental factors (e.g., workspace, location), and user characteristics (e.g., attitudes, motivators) that were not discernible from big data, and organizational factors (e.g. how work was organized). We then defined summary measures based on the coding framework that had emerged. These measures allowed us to connect the user stories with the big data in a way that allowed us to holistically examine the enterprise experience and discover patterns using the blended dataset. Mathematically best "fit" patterns were then identified in the blended dataset based on similarities in how employees used and responded to enterprises products and services [11].

These patterns became the foundation of our enterprise experience framework, which was composed of four main components.

- Core activities, or the high-level tasks, that all enterprise users engage in in order to accomplish work (e.g., find information, collaborate).

- Influencers, or core elements of the enterprise world, whose characteristics impact the user's ability to accomplish core activities (e.g., physical workspace)
- Themes, or the core experiences, that users wanted from the enterprise experience regardless of what product or service the user was interacting with.
- Segments, or groups of users, who interact or respond to IT products or services in a similar manner.

The experience framework became a conceptual model of the desired enterprise experience for product teams and provided a common vision to guide experience transformation. To help product teams use the framework to re-frame the experience of their product or service, we introduced large-scale, layered storytelling to unify the supporting framework collateral. Product teams used framework components to create their own stories that are relevant to what they are trying to accomplish; many stories are possible from the same data. The framework fuels UX roadmaps for portfolios by providing stories for agile teams. [11]

Agile Design Innovation Thru Design Thinking. In a world of package-based enterprise applications the concept of 'design' often gets lost. However, as IT shifts to delivering services, not just applications, design is increasingly playing a role. So in 2013, our UX group launched a new design service that focuses on taking what is known about the needs of enterprise users and generating innovative conceptual designs for enterprise services using design thinking and visualization techniques such as sketching or prototyping. Iterative in nature, the design process integrates stakeholders in the innovation process and seeks to co-create design concepts that are both feasible to implement and create value for the enterprise by increasing the pleasurability and efficiency of the products.

This agile-based approach used existing UX research and the previously discussed framework as a starting point for efforts to rapidly go from concept discussions to prototype. Previous UX work became the starting point for the team's "Vision Quest" activities and served as a catalyst to helping the team form a design hypothesis around core presumptions of what features and capabilities should be included in the solution [6]. A series of contextual scenarios were written from the design hypotheses which were then organized to form a high-level "narrative" or persuasive story of the product vision. These were then documented in a storyboard. To validate design presumptions, several intervals of presumptive design tests were conducted with end-users in tandem with design activities. Features not validated as "valuable" by users were removed from the storyboard and product vision. The vision iteratively became more defined and evolved into a 'lightweight' clickable prototype used to engage stakeholders and the technical team in feasibility discussions.

3 Conclusions

By seeking to transform the workforce, operational procedures, standards, and even ourselves as UX professionals, we have seeded transformation in individual enterprise products, the larger cumulative IT experience, and the larger IT shop. In the process, we have grown strong partnerships across IT that has further accelerated the infusion of

UX into the organizational DNA of our large corporate IT shop. We have found UX transformation can help corporate IT shops grow their strategic role within their enterprise and help re-frame their larger role in the corporation to. Our learnings along the way have implications for other IT groups looking to see a UX-centric transformation within their own organizations.

We have found that for UX to truly transform the enterprise experience, it must become part of the larger organization's DNA which means weaving UX into its culture, its standard operating procedures, and decision making. To do that, UX practitioners in IT shops must provide

- Easily consumable user insights to facilitate incorporation of UX into decision-making,
- UX training to shift the IT mind-set,
- UX tools and processes that are easy for non-UX professionals to leverage, and
- UX metrics to motivate change.

This "UX toolkit" must provide a holistic vision while at the same time provide insights at the product level to ensure that those responsible for individual products can work effectively together achieve the vision.

It's not enough for the UX professionals in the organization to act based on this information. Nor is it enough to get the buy-in of the CIO and senior leadership. Rather everyone right down to those who are "feet-on-the-ground" in the IT organization must work together in a well-coordinated fashion to achieve the vision. The road to a UX-centric transformation of an enterprise IT shop isn't necessarily easy, or straight, and is often fraught with ambiguity, but for those who persevere on this journey (and it is most certainly a journey), UX can seed a shared vision of the enterprise experience and focus actions on bringing the vision to life.

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