OCTO'S APPROACH TO USER EXPERIENCE DESIGN (UXD)

OCTO

Executive Summary

Octo Consulting Group, Inc.'s (Octo) User Experience Design (UXD) practice provides an iterative and incremental implementation approach focused on user-centered design, while also keeping in mind business, mission, and technological constraints. Octo's UXD approach enhances existing application development efforts by placing the customer first and using modern technologies to deliver responsive, interactive, compelling user experiences that improve customer efficiency and effectiveness. Octo executes this approach today at the National Geospatial-Intelligence Agency (NGA) as part of its transformational Globe, Map of the World, and Intranet efforts, and across the Federal Government as part of other critical, business, and mission-driven applications.

As depicted and described in the section below, Octo has a proven five step approach that helps agencies answer "**WHY**" a solution was or is built the way it is and how to optimize it for enhanced usability and customer satisfaction. The five-step framework includes the following key tenets:

USE OF USER RESEARCH AND ANALYTICS TECHNIQUES: Octo places strong emphasis on user research, and conducting user research early in the UXD approach, in order to understand user behaviors and needs accurately. Using artifacts such as User Personas, Mood Boards, and Preliminary Journey Maps, Octo creates an accurate depiction of the process that a typical user takes from start to finish. In addition, Octo analyzes solution or site analytics to understand landing and bounce-off statistics. Understanding these statistics helps our designers focus on areas where users have issues with either the design or content of the solution, which allows them to mark up those areas for future improvements.

LEAN UX IMPLEMENTATION: Our UXD approach embraces Lean UX principles to build a tangible prototype for users to test as part of each design sprint. At the beginning of each design cycle, Octo defines the minimum viable product (MVP), which results in a prototype that is tested and refined during each sprint. This framework ensures that users have a tangible prototype to test and provide feedback in support of future enhancements.

INCORPORATION OF ANTICIPATORY AND TIME SENSITIVE DESIGN: Octo's UXD incorporates approach process where the designers continuously learn user trends and behaviors as part of each design cycle. This ensures that our future designs consider what the users may expect in the future. In addition, Octo implements a time sensitive design where designers measure each user flow activity to gauge complexity. Subsequently, Octo conducts an analysis to understand which areas in the flow are taking more time, why, and how to improve upon the design based on the feedback.

COMPLIANCE WITH FEDERALLY MANDATED STANDARDS AND TECHNOLOGIES: Octo embraces the U.S. Web Design Standards released in 2015. We use those standards across some of our customers such as the U.S. Patent and Trademark Office (USPTO) and General Services Administration (GSA). In addition, Octo has participated in multiple GSA Hackathons and internal Octo Lab incubation projects where we have complied with the U.S. Web Design Standards.

CUSTOMIZED DESIGN TECHNIQUES: Octo has the expertise and experience supporting multiple visual design styles based on the users' and customers' needs. Depending on the technology stack and preference of the customer, Octo

can provide design expertise for skeuomorphic, flat, or material design. Octo also has experience developing designs across multiple platforms (including mobile, tablet or desktop) and solutions (website or applications).

CONTENT STRATEGY DRIVEN DESIGN: Given that the industry is moving towards the concept of micro-sites (messaging across multiple platforms such as blogs, apps, social profiles), a robust content strategy is critical to ensuring up-to-date content. Octo's framework considers this by building an overall information architecture that includes a process for developing, maintaining, and improving upon the existing content and content strategy.

USE OF DIGITAL ARCHITECTURE: Octo places strong emphasis on the use of digital services to assist user needs. Given the industry's transition to more commercial off the shelf (COTS) and open source solutions and technologies, Octo's framework recommends customers use next-generation tools and technologies where possible. Octo has successfully recommended and implemented digital architectures internally and for our customers.

THE BENEFITS OF OCTO'S APPROACH

Octo's approach to UXD yields a series of benefits for our Government customers:

Scientifically rigorous and defensible user interface design choices informed first and foremost by user desires as well as design best practices

Reduced cost and time-saved from performing efficient and effective design iteration and evaluation in advance of development vice after formal development occurs

Reduced customer fatigue from surveys and hands-off methods that don't fully capture their needs nor realize their needs in a reasonable timeframe

An approach that blends the science of human perception with the art of thoughtful, compelling visual design – implemented using the latest, modern web-based scripting and markup languages

Customer-centricity in action – with customers being the enduring, overarching influence from which information and visual designs emanate

Customer buy-in to design approaches because of their early, often engagement as part of Octo's approach to UXD

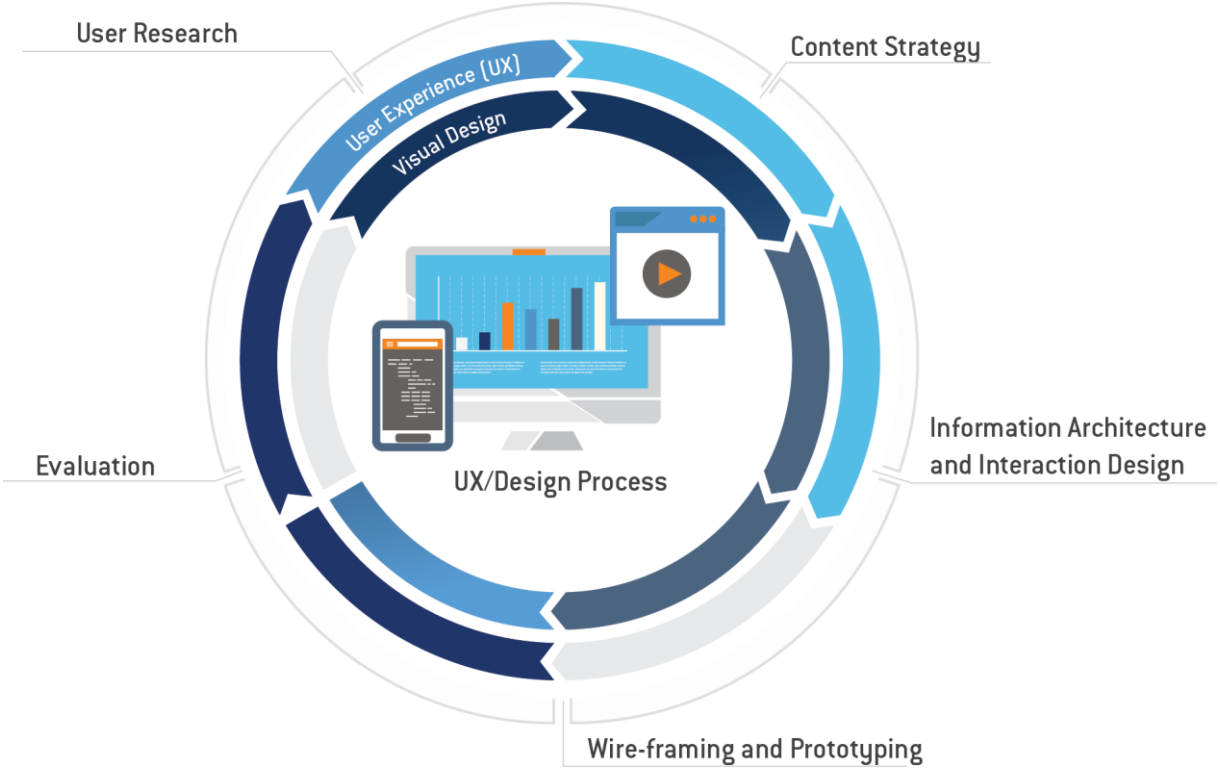
An approach that syncs to the prevailing Agile methodologies being used across the public and private sector to deliver software

OCTO'S APPROACH TO UXD BLENDS THE SCIENCE OF HUMAN PERCEPTION WITH THE ART OF THOUGHTFUL, COMPELLING VISUAL DESIGN

Octo's Approach to User Experience Design

Octo's approach incorporates the principles of human-computer interaction, user-centered design, and human factors to ensure scientific rigor behind the proposed methods and designs for a given system or tool. Octo understands that UX does not mean simply creating visually appealing interfaces, it also means having robust functionality that caters to users' needs. Octo's approach incorporates UX at the very core of its processes to ensure a permanent linking of User Research (needs and preferences), User Perception (mockups), and Usability (final functionality and performance). Additionally, Octo's approach is inherently iterative and incremental, with no single step occurring just once. Rather, there is an on-going cycle of design, evaluation, and redesign of system components until they successfully enable or improve customer efficiency.

Figure 1 - Octo's Approach to User Experience Design



Octo's approach seen in Figure 1 includes the following five steps:

User Research – A critical step in Octo's UXD approach is the extraction, aggregation, and synthesis of user needs and preferences. Octo's team of Certified Usability Analysts and doctorate level engineers use scientifically rigorous evaluation techniques to understand the current state of systems, challenges to customer productivity, and enhancements that could yield greater efficiency or effectiveness. The current state analysis uses both quantitative and qualitative methodologies. From a qualitative perspective, Octo conducts some or all of the following methods:

- Focus Groups and Contextual Interviews: In Focus Groups, Octo brings together a group of users in order to understand their perceptions, pain points, and opinions of the current state. Octo also conducts contextual interviews where we ask the user to walk us through a day-to-day operation or scenario during which we document observations of their workflow. Focus Groups and Contextual Interview helps identify additional issues and pain points that the user may not have identified previously.

- Surveys: To conduct research on larger or geographically dispersed audiences, Octo creates and collects feedback surveys. The responses are then tallied to identify patterns and help Octo prioritize which pain points to address first during design.

In addition, Octo's quantitative analysis includes the following:

- Website Analytics and Clickstream Analysis: Octo has experience using tools such as Google Analytics, Compete, Alexa, and other open source and proprietary tools that allow us to track visitors, landing points, and bounce rates. This data helps Octo identify patterns and potential usability concerns to fix in order to attract or retain users on the site, application, or product.

- Eye Tracking: Octo has expertise in using tools for eye tracking (such as Tobii) to accurately gauge what a user is viewing and identify areas where the solution content and features requiring rearranging. Eye tracking allows us to put the most important information in a place where the user sees that content first.

The result of the above activities is the development of accurate User Personas, Mood Boards, Process Workflows/Journey Maps, and an overall hypothesis on why systems are working or not. From this information, we are able to define new information architectures and visual designs. This user-focused approach, very much in keeping with the scientific method, allows the ability to rationalize design outcomes effectively.

Content Strategy – A website, mobile application, or system should support the larger strategy of an organization when communicating information to customers. Octo's execution of content strategy places function and information before form. We emphasize deliberate engagement with organizations to define their strategic goals, platforms, channels, and personas for their web site or application. This information then guides the identification of content - and in many cases products, services, or help information – aimed at increasing customer engagement, adoption, and loyalty. These goals also inform the workflows and work roles needed to maintain the content of the web site or application into the future. Finally, Octo works closely with stakeholders to identify a governance plan to maintain editorial review and approvals of content before publication.

Ultimately, Octo works early in the strategic planning around content *and* throughout the content lifecycle to make sure content continues to meet the needs of organizations and their customers. With a content strategy in place, and the content needs of users and of the organization identified, it is possible to begin the very first steps of information design, interaction design, and layout. It is also possible to begin content branding and web design discussions centered on a consistent look and feel of the interface and the content being presented.

Information Architecture and Interaction Design – The Octo approach to UXD recognizes the critical role information architecture and interaction design play in supporting content strategy and the larger strategic goals of the organization. Octo uses a series of tools and techniques to reach the level of fidelity required to enable future wire-framing, prototyping, and branding. Octo avoids the tendency to jump straight to

visual design and instead works closely with our customers and stakeholders to reinforce the importance of content being the driver of form and function. Octo realizes a coherent information architecture through two key processes – task flow diagramming, and card sorting.

Task flow diagramming supports a decomposition of anticipated user activity into a series of regular, repeated steps and behaviors. This helps the UX designer understand how and when a user will engage an element of the proposed system, which is the user's "mental model." A complete library of these task flow diagrams then enable a UX designer to understand the labels, navigation, hierarchies, and rudimentary layout required to support these task flows. These task flow diagrams and user mental models then serve as the basis for future time-sensitive design evaluation, which tests users for their ability to achieve the tasks identified in task flows in a timely manner.

Any UX designer can hypothesize about how best to organize labels, navigation, and information in general. Octo, instead, engages representative customers early in the information design process and asks them to organize these items based on how they would want to see it. Using card-sorting software like Optimal Workshop or UXSort, Octo prompts a scientifically rigorous sample set of users to organize information and then identifies patterns and preferences among them. The outcome of these sessions is a defensible, customer-driven hierarchy of labels, navigation, and initial design specifications. This is a great starting point from which to begin wire-framing and dynamic prototyping.

Octo works closely with our customers and stakeholders to reinforce the importance of content being the driver of form and function and not the other way around

Wireframing and Prototyping – A wireframe is a low fidelity visual representation of the information design, layout and navigation gleaned from earlier research. As part of any UXD effort, Octo uses a Lean UX model of identifying the top pain points identified during the User Research phase and developing a MVP plan for that design cycle. This focuses the design team on user's most pressing issues first. Each design cycle includes the identification of a MVP prior to the development of the Lo-Fi and Hi-Fi wireframes. In addition, Octo often does its first wireframes on paper to allow quick iteration, markup, and enhancement. Octo then engages a small sample set of customers with these paper wire-frames to validate that they are moving in the right direction before investing more time into HTML and CSS-based wireframes.

Octo regularly uses Axure RP and Balsamiq to creative dynamic, interactive wireframes from paper. Once we have a series of wireframes created, we use Invision or UX Pin (for web applications) or POP (for mobile applications) to demonstrate clicks and process steps on the wireframe. These dynamic wireframes give customers a better sense of a final web site's interactions and navigation and can serve as useful HTML "outlines" for a future, Hi-Fidelity prototype. Octo believes, and has validated in its delivery to the Intelligence Community, that testing on paper and low-fidelity wireframes is far less expensive than delving directly into Hi-Fidelity. It is for this reason that Octo spends a large proportion of time in this wireframing and prototyping phase to garner customer buy-in to a proposed user interface design. The last phase of this step includes a Hi-Fidelity prototype (using HTML5, CSS, Bootstrap, and JavaScript) of

the final site absent more complicated functions and features like search or customization. Octo will take into consideration the U.S. Web Standards published by the U.S. Digital Service and GSA 18F to develop the Hi-Fi prototype. In addition, depending on the needs of the customer identified during the earlier phases, Octo will promote the use of Skeuomorphic, Flat User Interface (UI) and/or Material Design.

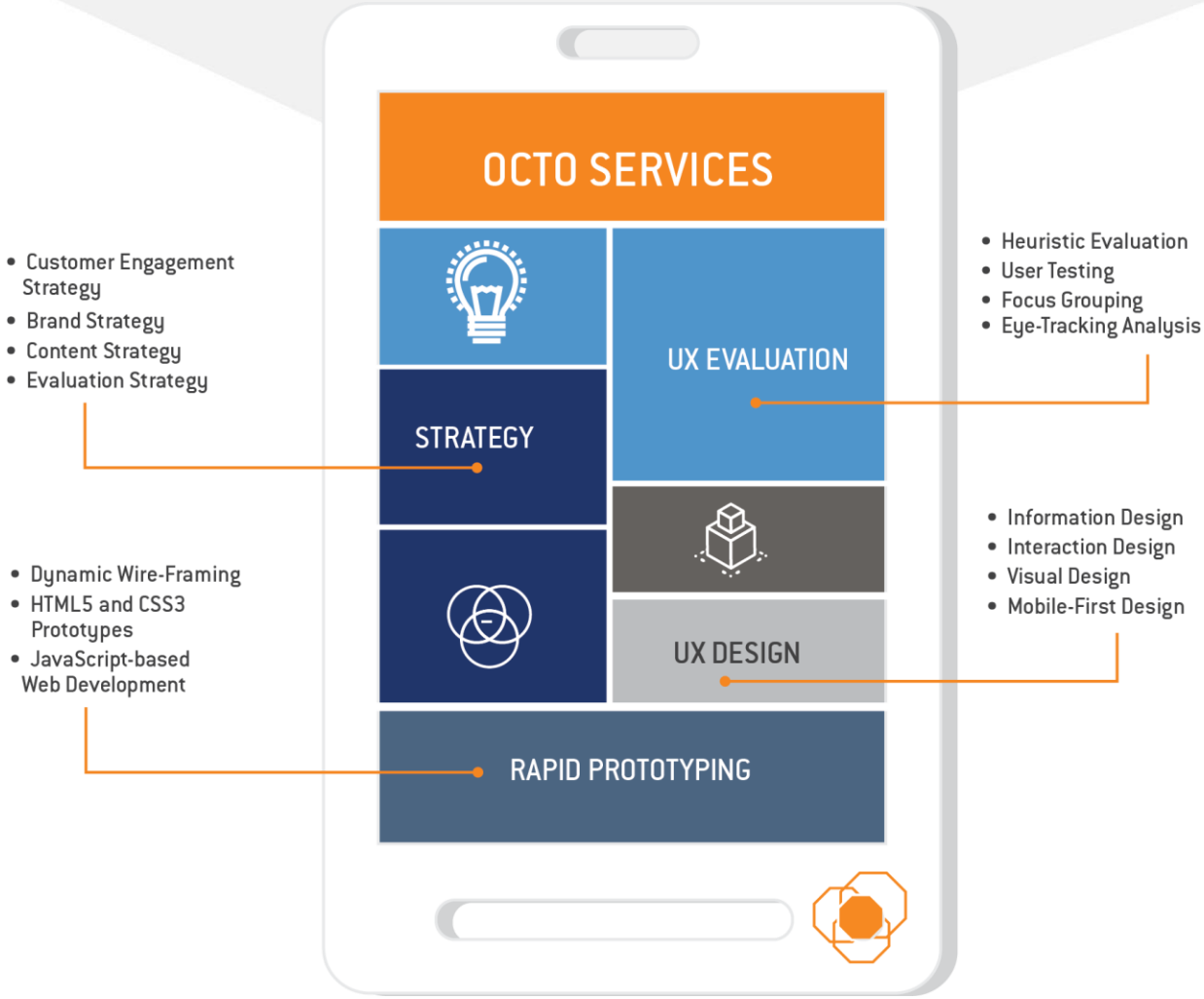
Octo takes advantage of modern responsive design frameworks like AngularJS, JQuery, and Ember to automate and quicken the prototyping process. These live, working prototypes then become the basis for formal software development. Their underlying HTML markup and CSS provide usable global styles from which to build other site pages and components.

Evaluation – The final and most frequent step in Octo's approach to UXD is Evaluation. Octo uses multiple techniques to evaluate a prototype design including heuristic evaluation, user testing, focus grouping, and A/B testing. Techniques like heuristic evaluation allow a UX designer to evaluate a design against key design principles around color, pattern, spacing, navigation, typography, and myriad other design elements. Research demonstrates that heuristic evaluations find 50 percent of the design issues at a far lower cost than user testing, thus it is the first tool in the toolbox of an Octo UX designer. Industry leaders like Jakob Nielsen and Don Norman provide useful heuristic standards to use when evaluating interfaces. These heuristic standards aid Octo designers when evaluating the success of system status and feedback, user control, user recognition and recall, error recovery, and aesthetics.

Octo UX designers use user testing to help identify the other 50 percent of design issues that users reveal when engaging with the actual prototype or system. These issues are often far more specific to the use case or domain and require the UX designer to prompt and illicit explanation that might otherwise go unspoken. Octo UX designers include time sensitive design evaluation, which evaluates customer completion of work tasks for speed to completion. Octo then looks for areas of improvement in information or interaction design, which would improve speed or ease of use. Focus groups provide a larger sample set of users from which to glean general preferences or dislikes and A/B testing provides an automated method to compare user performance on two interfaces directly without explicitly advising the user of this on-going research. Finally, Octo UX designers administer the SUS and NASA TLX to re-baseline user performance and document improvements or on-going sticking points in user sentiment.

Octo Services

Octo engages with its customers in different ways to support their individual needs. Consider using one or a combination of the following Octo services to address your organization's UXD challenges.



Octo's Approach to UXD in Action: Customer Examples

Map of the World 2.0 Design (U//FOUO)

Octo executed its UXD approach to support visual design and front-end prototyping of the Map of the World (MoW) geospatial visualization solution deployed at NGA. Working closely with the developer, Octo delivered customer-driven designs that helped to ease user access to NGA's geospatial base maps and feature layers while still enabling a highly usable, customizable user experience. The MoW currently serves as NGA's principal public-facing mapping tool supporting information discovery and geospatial correlation and analysis.

Globe / XDI Style Guide

Octo used its UXD approach to deliver a responsive, dynamic, and easily shippable style guide enabling the Globe development team to adhere to Xperience Design (XD) design patterns. This style guide included guidance for typography, color, logo usage, and adherence to XD's preferred CSS and JavaScript libraries including Bootstrap, JQuery, and Fuel UX. Globe developers use the style guide on a daily basis to ensure compliance and consistency for NGA's intelligence, warfighter, and disaster response customers.

18F Rapid Prototyping / Hackathon

Octo used its approach to UXD as part of its response to the GSA 18F request for proposal. Octo integrated its UXD approach into a five-day hackathon enabling rapid iteration, prototyping, and customer usability testing supportive of enhancements and an improved user experience. Octo visual designers, front-end developers, and user experience analysts embedded into Agile development teams to collaborate on the rapid delivery of customer-centric capability. Specifically, Octo used Data.gov data holdings to create a portal for user discovery on efficacy, side effects, and dosage information on pharmaceuticals.

Octo Consulting Group, Inc.

Octo provides the Federal Government management consulting and technology solutions in support of critical missions. As an experienced federal digital services provider, Octo fully understands what it takes to deliver complex technical solutions to large, mission-focused organizations. Octo currently leads major technical engagements for the NGA, Department of Labor, Federal Bureau of Investigation, United States Agency for International Development, and the United States Army. Octo delivers Agile software development, UXD, infrastructure and cloud engineering, visualization, and management consulting services to enable Agency mission success. Since 2006, Octo has received multiple awards for achievement and workplace satisfaction including the Fairfax Chamber of Commerce – Washington Technology Government Contractor (GOVCON) Contractor of the Year (2012), Small and Emerging Contractors Advisory Forum (SECAF) Contractor of the Year (2012), and Washington Business Journal and Washington Post Best Places to Work. Octo has received appraisal at CMMI Maturity Level 4 under Development (CMMI-DEV) constellation.

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