Putting humans first to innovate federal IT projects

A white paper on Human-Centered Design

By John B. Carr

Technology's purpose is to serve humanity - to make our lives better.

Of course in most ways it has, and this document will not explore the depths of that philosophical question in too much detail, but something has gone wrong. We see it at the end of each work day, when our eyes hurt after hours of staring at a computer screen[1], or when we navigate endlessly through an application to find that one feature, which was the only reason we purchased it. We see it in the news, most recently in the deaths of 157 people on Ethiopian Airlines Flight 302, likely due to the over automation, or perhaps the lack of pilot training on a new feature, for a fleet of Boeing airplanes. Design matters.

As big data becomes an actual challenge for organizations, we are seeing a revolution in the form of Artificial Intelligence (AI) or Machine Learning. This new technology promises to provide us with computer generated insight and context into previously unmanageable information, through the use of algorithms, entity resolution and by estimating human sentiment or emotion based on the text it is fed.

We need to slow down and listen to our true needs. Too often the human element is overlooked. Few actual innovations happen in a vacuum or overnight, but all innovations have successfully improved the lives of a customer segment which now cannot see how they lived without it. These solutions were successful because they didn't ignore the true human needs of their proposed customer and took their time to understand them thoroughly. We need to automate the areas that make sense, and not just to "increase efficiencies".

One approach to allow us to accomplish a more careful approach to technology and automation is Human-Centered Design (HCD).

Federal Focus

While technology and automation effects everyone, the focus of this white paper will be in the public space. More specifically, federal agencies information technology projects. The examples will draw from my experience support federal clients and challenges, because that's what I know, but also because of its prime position to add the most value if exercised. That said, the application of the HCD approach is almost endless. In fact, organizations like IDEO[2], have used HCD techniques to "create positive impact through design" for years across the global, from social challenges like women's rights to designing consumer goods & services. This approach is not new, but well tested and moreover, ready for federal adoption.

The federal adoption to design thinking has already begun, through organizations like the Lab at OPM and GSA's 18F program. Due to its public facing and mission focused nature, the federal government is incredibly ripe with complex challenges screaming out for the HCD approach. There are so many services offered by the federal government that can be streamlined, digitized or otherwise improved to provide the American people a solution that would delight them. Regarding the earlier example of big data, there are few other organizations in the world that are so effected by this challenge. Take for example NOAA, which collects sensor information across all our oceans, sometimes in real time, or the

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[1] Friendly tip – follow the 20/20/20 rule – which is, every 20 minutes, look at something 20 feet away for 20 seconds. Your eyes will thank you.

[2] IDEO, www.IDEO.org, is a global design company committed to creating positive impact established in 1991.
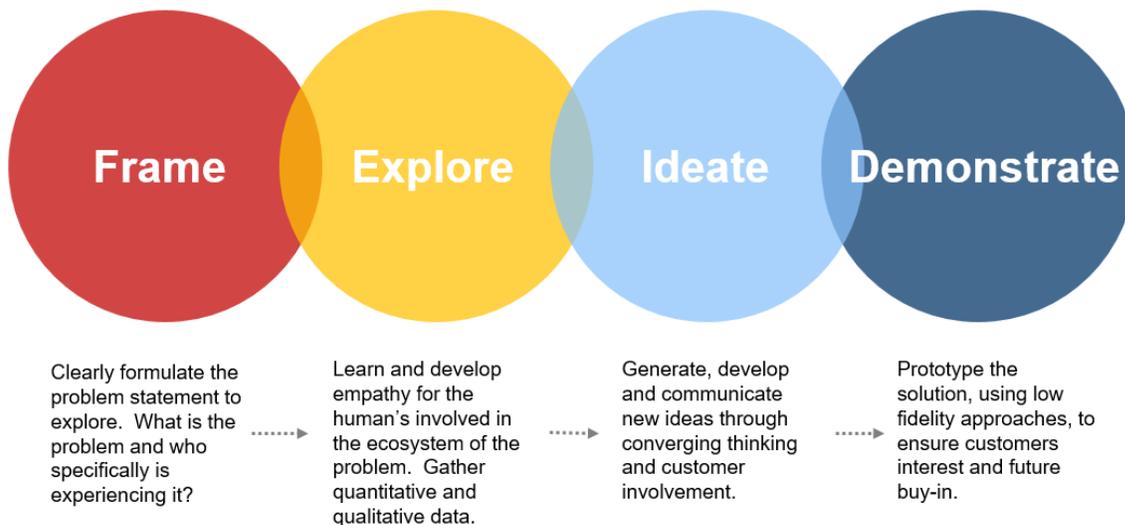
Justice Department, who receives petabytes of digital evidence to process and review by law enforcement and litigation professional. Instead of investing millions of tax dollars on the next great AI solution, maybe it's time to take a step back and speak with humans to understand their true jobs to be done. Maybe automation or AI or technology in general, is not the answer at all.

What is Human-Centered Design?

Human-Centered Design (HCD) is a creative problem solving approach that starts with the people who are experiencing a problem or issue and moves towards developing a solution that addresses their true needs. The goal of HCD is to gain and refine insights by building empathy and a deep understanding of the proposed customers. By truly understanding the people effected by the challenge (and future solution) and then diverging and later converging on the many different potential solutions, more authentic, richer results can be designed. The HCD approach has been described in many different flavors by various organizations, but my below summary of the approach breaks it down into four basic stages: Frame, Explore, Ideate and Demonstration.

Frame — Clearly formulate the problem statement to explore. What is the problem and who specifically is experiencing it?

Explore — Learn and develop empathy for the human's involved in the ecosystem of the problem. Gather quantitative and qualitative data.

Ideate — Generate, develop and communicate new ideas through converging thinking and customer involvement.

Demonstrate — Prototype the solution, using low fidelity approaches, to ensure customers interest and future buy-in.

The HCD stages are not always linear, but can give federal IT projects a framework. Often, a designer or team may move from framing the challenge directly to ideation. In other cases, through demonstrating the prototype, the designer finds that they have to go back to the drawing board and gather additional data points (Explore) or even re-frame their problem statement.

A stage (or perhaps element) not visualized above, is the need for the project team to continuously measure what has been learned. The team should gather data points not just during the explore phase, but every time a customer provides feedback to guide iteration and improvements.

One model that can be effective in implementing the HCD approach, is to employ a small, cross-disciplined design team task with a briefing or challenge, with a lead that understands the HCD techniques. Another model may be to train key "change agents" on the foundations and send them back to their IT programs, empowered and ready to innovate. Both models have their benefits and weaknesses, and choosing one dependent on many things, including the organizations culture, senior leadership buy-in, and the implementer's trust level with the customer bases.

A Smarter Way to Federal IT Planning

In 2018, the federal government spent $95.7M on IT projects. While over 78% of that money was set aside for legacy systems (O&M), there has been increased budgetary focus on improving or establishing new public facing solutions.[3] The four basic stages to the HCD approach (Frame, Explore, Ideate and Demonstrate) can be used as part of any federal IT project planning to ensure the human factors are considered. These stages are elaborated in the following sections.

Frame

To begin to resolve any challenge, we have to first understand it. What is the problem? What systems does it touch? What type of people are experiencing it? HCD is a tool to innovate, so we must be able to answer if a proposed solution is technically feasible, has business viability, and has high customer interest (the intersection of these three points will go a long way to ensure successful deployment). To identify the solutions position to these three points, we need a starting point. That "Point A" is the framing statement.

A framing statement can start with a "How Might We", and include a specific challenge and customer base to inspire and explore. Or, a "job-to-be-done" statement can be considered, which includes an action verb, object of action, and a contextual clarifier.

JTBD is a collections of principles that help us understand customer motivations. This, in turn, will ensure the product or service being developed taps into those motivations effectively and make adoption easier. The JTBD framework was first introduced in 2007 by Harvard Business School professor Clayton Christensen, and was soon after mentioned in the Innovator's Toolkit[4]. Prof. Christensen argues that customers rarely buy things (or use things) around what the average customer in their category (i.e. the customer's age, race, marital status, or other attribute) may do, but instead find themselves with a problem they want

to solve. They "hire" products/services to solve a "job" they perceive.

With either framing statement, the more precise the higher the likelihood of product or service success. It also helps to have an up-to-date stakeholder map and an advocate or subject matter expert to support the development of the framing exercise.

Explore

With a clear understanding of the challenge, an interview plan or other customer discovery plan can be formulated. The goal in this stage is to develop a deep understanding, and even more important, empathy for the customers you have identified. This can be achieved in a number of ways, through in-person or virtual interviews, embedding, or guided tours (going out and seeing for yourself).

Careful thought and planning should be done prior to asking a customer for their valuable time. In many cases, you are asking these people to work longer hours to accommodate your discovery. Or other cases, you are asking people questions that may challenge long standing feelings or emotions. Develop a plan that validates the assumptions you have, and collects as much qualitative and quantitative data points for future synthesis. The empathy you develop will lead you to greater insights.

Ideate

In many respects, ideation is where the rubber meets the road. The team must make sense of everything they learned through their customer discovery and generate ideas to solve them by designing a solution. They must first diverge and get creative with their solutions. It's vital the insights are clear and understand by the team – creating Insight statements or refining the JTBD or HMW statements is a good first start. No idea is wrong, but some are stronger than others. For those ideas that bubble to the top, the team can then converge on them by developing visual representations of them. I often create user

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[3] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/ap_16_it.pdf

[4] http://innovatorstoolkit.com/content/technique-1-jobs-be-done

experience journey maps or data maps that define each step of a process we explored with a human emotion noted. I then identify a natural solution to those pain points. This provides context and buy in, and often the simplest solution is the most meaningful.

Demonstrate

The proposed solutions should be shared as soon as possible to validate it with the customers. Prototyping, or "thinking with your hands" is often used to describe a solution at this stage. We want to learn as quickly as possible and not spend much money on our education. This means we can develop low fidelity example of the solution, like drawing an applications interface on sequenced sheets of paper and showing it to our proposed customer to refine that design in real time.

In more complex IT projects, it may not be possible to sketch out the solution to gain customer feedback. Perhaps there's a web portal senior leadership feels should be developed to allow key federal employees to access basic analytic tools, but the proposed customers may feel uneasy about using such tools. Before a major investment is done, mock up the experience, by exploring the employees' real life drivers. Will the user understand the intent of such tools? How will the data journey change? In these situations, demonstrating the proposed engagement to the tool is just as important as the solution itself.

The project team may create a story board that shows the expected experience. After feedback is received on the story board and making adjustments, the government may feel it's time to move from prototype to build. At this stage, the government could invest in the development of a minimally viable product through agile sprints and engage a small cross section of proposed customers in testing it, clearly document the performance and experience. In this way, the federal government is collecting evidence and learning how the small team may need to adapt or abandon, without being locked into a major investment.

Conclusion

While HCD is not an approach that can be deployed for every federal IT challenge, it should be a tool in every agency's toolkit. The service offerings, in many cases, are just too important for the design to not be carefully considered. Take for a final example, the U.S. Digital Service's Playbook[5], which places design thinking practices, like "understanding what people need" and "addressing the whole experience from start to finish", as central to their recommended approaches to building federal websites, email and mobile applications. We are starting to see top-down policy that is suggesting this type of human focused approach should be part of every federal agencies IT strategic plan, to frame, explore, ideate and demonstrate each IT solution to ensure the American public are put first.

For more actionable information on the HCD approach, one of my favorite resources is Design Kit's "The Field Guide to Human-Centered Design" by IDEO.[6]   Additionally, if you are a federal employee I would highly recommend attending a course at the Lab at OPM.[7]

For any questions or inquiries about this white paper, please reach out to me at johnbutterfieldcarr@yahoo.com.

Thank you for reading!

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[5] https://playbook.cio.gov
[6] http://www.designkit.org/resources/1

[7] https://lab.opm.gov/class-sign-up/