A Review of Human-Centered Design in Human Services

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Introduction

Human services programs, such as those funded through the U.S. Department of Health and Human Services' Administration for Children and Families (ACF), address complex social issues ranging from supporting healthy relationships, child welfare, and economic mobility to providing high-quality, accessible early childhood programs. However, the human services sector may experience challenges to efficient and effective service provision due to funding constraints, leadership or staffing challenges, operating under multiple competing demands, and changing regulatory requirements (The Kresge Foundation, 2015; Oliver Wyman & SeaChange Capital Partners, 2018). These types of challenges, often referred to as "wicked" problems, are particularly complex because they can be defined in multiple ways by different people and are particularly hard to solve (Rittel & Webber, 1973; Roberts, 2000). Approaches that spark innovation are needed to address these "wicked" problems faced by human services programs.

Human-Centered Design (HCD) is a problem-solving and design approach that emphasizes designing for and with those who will ultimately utilize the solution (i.e., the end user). HCD emerged from the technology sector, where it was first used for rapid product development (Norman & Draper, 1986). Because of its inherent focus on customers, recipients of services, or anyone who is designated as the end user, HCD appears to have potential for promoting effective, efficient, and compassionate service delivery aligned with the mission of ACF (ACF, n.d.). Despite this appeal, the implementation of HCD within human services is relatively novel (Bazzano et al., 2017; McLaughlin et al., 2019), and there has been little empirical work to date on how HCD might be used to improve outcomes of interest to ACF programs. Given the structural complexity of human services organizations funded by ACF and the complexity of social issues they address, it is unclear how well HCD may translate to this context, or the extent to which the approach may be both feasible and effective.

Examples of "wicked" problems HCD may help address

- Providing affordable childcare to families who work nights and weekends when existing childcare is already costly and scarce (Chan, 2018)
- Promoting stability for children in foster care when placement moves are frequent and there is instability among foster parents (Kershaw et al., 2016)
- Designing engaging interventions for out-of-school youth that will produce positive outcomes (Maher & Maher, n.d.)

Child TRENDS OPRE MEF ASSOCIATES anthrotech

In this brief, we present a definition of HCD that is applicable to the context of human services delivery, differentiate HCD from similar design and problem-solving approaches, and describe how HCD is being used in human services. We also explore what is currently known about evaluation efforts to date and how HCD practices may be sustained in human services programs. To define HCD and the current state of the field as it is relevant for human services programs, we undertook two complementary activities: (1) a literature review, and (2) an in-depth review of case examples from three human services programs that have used HCD to address a problem in the past. See Appendix A for information on our research methods.

Human-Centered Design (HCD) Is Both a Process and a Mindset

One of the challenges in defining HCD is the existence of multiple terms that are used interchangeably in the literature and the field (Altman et al., 2018; Bazzano et al., 2017; Code for America, 2017; DC Design, 2017; Lake, 2016; Liedtka & Salzman, n.d.; Vechakul et al., 2015). This may be related to different terms for similar design approaches having been generated by different firms and academic centers. For example, IDEO popularized the terms *human-centered design* and *design thinking* (Design Kit, n.d.a; IDEO Design Thinking, n.d.), while the Hasso Plattner Institute of Design at Stanford also popularized the term *design thinking* (Doorley et al., 2018), and the Nielsen Norman group popularized the term *user experience design* (Norman & Nielsen, n.d.). Here we define HCD, describe its key principles, and explore the different ways HCD has been conceptualized (i.e., as a process and as a mindset) in order to facilitate understanding of terminology that continues to evolve with the field.

HCD is a design process and mindset that centers the end user to address complex problems in an innovative way.

From a research perspective, it is difficult to study HCD and draw conclusions across studies without a common definition of HCD that can be applied across contexts. For the purpose of this project, we present a definition below, drawn from a review and synthesis of the literature:

Human-centered design is a process and a mindset for addressing complex problems by designing solutions with those who will ultimately utilize the solution (i.e., end users). HCD is guided by key principles that promote empathy for end users and the generation of new and creative solutions by "[taking] into account behaviors, ways of thinking, needs, and aspirations" (U.S. Office of Personnel Management, n.d.). A design team comprised of individuals from multiple perspectives engages both end users and stakeholders[1] (such as partners, community organizations, staff from other departments, etc.) throughout an iterative process that tests proposed solutions and refines them based on feedback. Ideally, the intensive involvement of end users and stakeholders will help ensure solutions are both easily adopted and effective.

[1] While some scholars have expressed concerns about the term "stakeholder," because of its connotation and potential to obscure power dynamics (Centers for Disease Control and Prevention, 2021), we use it here for clarity due to its unique meaning within the field. Where it is possible to replace 'stakeholder' with a more specific term, we do so.

The HCD process and mindset are complementary and interrelated.

HCD has been conceptualized as both a process and a mindset, which are different, yet complementary aspects that we believe should both be considered in the definition. For example, HCD has been viewed from a number of different lenses and is referred to as an approach (DC Design, 2017; Design Kit, n.d.a; Mad*Pow, n.d.; Persson, 2017; Vechakul et al., 2015; Weeby, 2018), method (Sandfort & Sarode, 2018; Weeby, 2018), process (DC Design, 2017; Vechakul et al., 2015), philosophy (Norman, 2013), framework (Vechakul et al., 2015), perspective (Persson, 2017; United States Agency for International Development [USAID], 2021), mindset (DC Design, 2017), skill set, and discipline (Matheson et al., 2015).

A process. When discussed as an approach, method, process, or framework, HCD may refer to a specific toolkit or set of tools that are used to guide a team in using HCD. To promote clarity, we refer to this conceptualization of HCD as a "process."

A mindset. When discussed as a perspective, mindset, skill set, philosophy, or discipline, HCD may refer to the orientation an individual or organization takes toward problem solving that focuses on empathy building and incorporating the perspectives of end users. Again, for clarity, we refer to this conceptualization of HCD as a "mindset" that may be generated when individuals or organizations engage in the HCD process. Over time, an individual or organization may institutionalize this mindset after ongoing use and formally integrate the mindset into standard operating procedures. Alternately, an HCD mindset may be embedded into how individual staff members approach their work even if the HCD process is not formalized.

It is also interesting to note that the HCD process may reinforce the HCD mindset, which then strengthens the process. That is, when engaging in the HCD process, design teams question assumptions and challenge the status quo. In doing so, the individuals on the design team may gain new perspectives that enhance their understanding of the problems they are trying to address. This deeper understanding may then help the team engage end users more authentically and incorporate their ideas and feedback more fully into the design and execution of a solution. A critical aspect of this process-mindset interaction is the empathy for end users that develops through the process of engaging them (Vechakul et al., 2015).

HCD utilizes six key principles that center the end user and engage stakeholders.

In contrast to HCD terminology, there are core principles of HCD that are widely accepted within the literature. There is no one definitive source that presents HCD principles, but the International Organization for Standardization (ISO)—an organization that sets standards across a wide range of topic areas, such as technology and management—offers a list of principles that concisely reflect the broader literature. ISO suggests one must adhere to the following six principles for their work to be considered HCD:

1. **Understand end users and stakeholders**: The design solution is rooted in explicitly understanding the needs, tasks, and environments of these individuals.
2. **Engage with end users and stakeholders throughout**: These individuals are meaningfully engaged throughout the design process (i.e., from helping define the problem to brainstorming and testing potential solutions).

3. **Test and revise solutions based on end user and stakeholder feedback**: The design is created and revised based on feedback from these individuals.
4. **Iterate**: The process may not be linear, meaning the team revisits prior steps to ensure the final solution best meets the needs of the end user.
5. **Consider entire experience**: The design solution considers the contexts in which end users live and the solution operates.
6. **Collaborate across disciplines:** The team of individuals collaborating to design solutions (i.e., design team) should represent varied skillsets, areas of expertise, and perspectives to promote cross-learning and understanding (International Organization for Standardization [ISO], 2019).

A key component of HCD principles is the centrality of both the end users and stakeholders throughout the process. End users are the people for whom a solution is being designed (i.e., those who directly engage with the design solution), while stakeholders are those who have an interest in the design solution, but may not directly engage with the solution. For instance, the latter group could include individuals from partner organizations, community organizations, staff from other departments, and any others who have an interest in the design. HCD aims to help design teams develop empathy to better understand the unique needs of end users and stakeholders, and to ensure that these needs are considered throughout the design process (Liedtka et al., 2018; Office of Family Assistance, 2015b).

Each HCD principle is considered necessary for a process to be considered HCD (ISO, 2019). Other design approaches may utilize a subset of these principles without incorporating all of them, or may use additional principles not central to HCD. While the remainder of this brief focuses on HCD, there may be some examples presented that may not have used all of the key principles of HCD, given limited available information.

The HCD process occurs in iterative phases.

There is no singular step-by-step HCD process routinely employed for all problems. Based on a review of resources describing how HCD is used in practice, most HCD design processes begin with phases of defining and understanding the problem and conclude with implementation of user-tested and refined solutions. There are several commercially available toolkits that help define the HCD process more formally by providing a guiding framework and a description of practices, or "tools," one may choose to implement. Commonly used toolkits include those from IDEO, Luma, Motiv Strategies, and the Hasso Plattner Institute of Design at Stanford (also referred to as the 'd.school'; see Appendix B for a summary of toolkits). A common feature of these toolkits is that they follow a structured process for implementing HCD (Liedtka, 2014). For example, IDEO's (inspiration, ideation, implementation; IDEO, 2015) and Luma's (looking, understanding, making; Luma Institute, n.d.) toolkits each go through three phases. Although each toolkit may rely on a different number of phases, generally there are between three to seven phases used to describe the process (Interaction Design Foundation, n.d.a; Righi & James, 2007).

Based on our review and synthesis of the available literature and toolkits, we identified five phases for engaging with HCD: research and discover, synthesize and generate solutions, conceptualize and prototype, test and iterate, and implement and refine. See Table 1 for a summary of each phase and common methods used to achieve the goals of each phase.

Table 1. HCD Phases Identified in the HCD Literature

Phase	Description	Example methods
Research and Discover	The goal of the research and discover phase is to learn about the lives of end users to understand their needs, constraints, motivations, and context free of prior assumptions and without jumping to solutions. During this phase, the design team seeks to understand the perspective of the end user, how past efforts to address the challenge have succeeded or failed, and the ecosystem in which the end users live. The perspective of key stakeholders is also considered and assessed during this phase. This phase supports building empathy for the end user (Doorley et al., 2018).	• Surveys • Diary studies • Interviews • Literature reviews • Stakeholder mapping
Synthesize and Generate Solutions	The primary goal of this phase is to synthesize the research findings to fully understand the problem from the perspective of the end users and generate insights that can lead to new or creative solutions. A second goal is to generate many different creative ideas and explore many possible solutions. Towards the end of this phase, ideas are often narrowed down through prioritization exercises, the consolidation of ideas, and by evaluating what is feasible, viable, and desirable according to both end users and stakeholders.	• Design parameters[2] • Affinity diagramming[3] • User personas[4] • User scenarios[5] • Journey maps[6] • Design workshops[7]
Conceptualize and Prototype	During this phase, design teams move from prioritized ideas and insights into prototypes (i.e., possible solutions) that visualize the design solution to make it more tangible. The goal is to create rough (or "low-fidelity") design solutions that can be tested with end users before a prototype is perfected (Thimbleby, 2008). Prototypes can be built for digital tools, physical spaces, services, events, and communication products (e.g., forms, policies, messages).	• Concept posters • Storyboards • Service blueprints

[2] Design parameters are rules that must be followed based on what was learned through the research and discover phase. For example, if end users are staff who are already over-burdened, any solution must not result in a net increase in workload for staff.
[3] Affinity diagramming is a way to organize large amounts of information into themes and see what is most important (Weprin, 2016).
[4] User personas are fictitious and realistic representations of target end users (Pruitt & Aldin, 2006).
[5] User scenarios are descriptions of the tasks end users undertake.
[6] Journey maps are process maps showing how an end user will experience a solution (Design Kit, n.d.b).
[7] Design workshops are where many possible solutions are generated by the end users in collaboration with the design team, subject matter experts, and/or other stakeholders.

Phase	Description	Example methods
Test and Iterate	The goal of the test and iterate phase is to evaluate low-fidelity prototypes to determine what is working well, what needs improvement, and why. During testing, the design team gathers data on end users' ability to understand and use the solution, end users' satisfaction and likelihood to adopt the solution, and other metrics. Often, the design team may discover that the solutions they translated into prototypes do not fully address the needs of the end users and require further refinements and changes. Therefore, the team may need to circle back to earlier steps to generate additional ideas (enacting the "iterate" principle).	• Usability tests • Interviews • Cognitive walkthroughs[8] • Role playing
Implement and Refine	This phase is about implementing the design solution and planning for ways to continue to get feedback after starting implementation. By this phase, the design team has tested and iterated enough times to refine the solution(s) to the point where they are ready to implement. End users have been involved throughout the process and stakeholders' perspectives on feasibility and viability have been integrated, providing a high level of confidence in the selected solution(s). Depending on the type of solution, this step may include developing the solution (through coding, building, writing, programming), developing an implementation plan (what will be implemented and when), piloting the solution on a small scale, developing communication and marketing plans, developing governance frameworks, and planning end user feedback loops.	• Development of solution • Development of implementation plan • Small scale pilot studies of the solution • Development of communication and marketing plans • Development of governance frameworks • Plan for end user feedback loops

HCD Is Similar to Other Design and Problem-solving Approaches

As mentioned above, HCD is often used interchangeably with other design terms such as design thinking, user-experience design, and participatory design. Indeed, design thinking is used so synonymously with HCD that consensus on similarities and differences could not be achieved based on the existing literature and expert consultation; therefore, we do not address this term further. Other design approaches can be discriminated in subtle ways. HCD is also closely related to problem-solving approaches such as Agile and the Breakthrough Series Collaborative (see Table 4 for definitions of these approaches). Clarifying how these design and problem-solving approaches are similar to and different from HCD, and when they can be used together, will support future HCD research.

[8] A cognitive walkthrough is a method that steps through the many actions people need to take to achieve a goal. This method helps capture everything end users would expect to be a part of the design solution.

HCD shares principles with other design approaches, but there are some key differences.

Several other design approaches share features with HCD, including the engagement of end users. For example, there is participatory design, user-centered design, and more. These various design approaches share many of the HCD principles, but may emphasize certain principles more than others. Some of these design approaches can be used with HCD in complementary ways. For example, there are frameworks that conceptualize these various design approaches as nested within one another, such as user-experience design being nested within service design (Lake, 2016). Table 2 summarizes these other approaches and their key differences from HCD.

Table 2. Other Design Approaches

Design approach	Key difference from HCD
Participatory Design (i.e., Co-Design) • Emphasizes the importance of engaging end users, stakeholders, designers, and other team members during the design process (Bjögvinsson et al., 2012). • Aims to give those affected by a design a say in the design process (Sanders et al., 2010).	• May not include end users in the final decision-making process (Cipan, 2019), while HCD includes end users throughout the process.
User-Centered Design • An iterative process in which designers consider the end users throughout the entire design process (Interaction Design Foundation, n.d.c).	• Unlike HCD, user-centered design may not consider the larger pool of stakeholders beyond end users of a solution (ISO, 2019; Dopp et al., 2018).[9]
Equity-Centered Design • A design process that explicitly focuses on promoting equity by understanding history and recognizing and countering biases, assumptions, power dynamics, and related constructs to promote inclusiveness during design processes (Anaissie et al., 2016; Creative Reaction Lab, n.d.).	• In contrast to HCD, equity-centered design brings equity and inclusion to the forefront of all design activities.
User-Experience Design • Emphasizes the importance of end users' involvement in the design process.	• Emphasizes the interface between individual end users and the end product (typically in the technology space; Interaction Design Foundation, n.d.d), which often occurs later in the design process. In contrast, HCD emphasizes the inclusion of end users and stakeholders throughout the design process.

[9] This differentiator is not largely agreed upon in the field, as some experts engaged in this project do not see stakeholder engagement as a key differentiator between HCD and User-Centered Design.

Design approach	Key difference from HCD
Service Design • Takes into account the end user's experience with the specific solution but also examines the full end-to-end process (or "service") in which the solution is embedded (Interaction Design Foundation, n.d.b; Pybus, 2019).	• Focuses on the end-to-end process (or "service") in which a design solution is embedded, while HCD focuses more on the design solution itself (Pybus, 2019).
Systems Thinking • Considers how a design fits into a full system, including values of an organization, consistency within an organization, integration into an organization, and the maximization of resources (Kim, 1999; Tjendra, 2018).	• Focuses on the system in which a design solution fits, while HCD focuses more on the design solution itself.

Subtle differences in these approaches may be easiest to understand through an example. Table 3 provides an illustration of the core focus of each design approach if an organization wanted to create a new process to enroll a client in a human service. Ultimately, what distinguishes HCD from other design approaches is the emphasis on engaging end users and stakeholders at all stages of the design process.

Table 3. Example Application of Each Design Approach

Goal: A program wants to create a new process for client enrollment.	
If the only process used was:	Then, the core focus might be on:
Participatory Design	The process of co-designing with clients and stakeholders before the final design decision.
User-Centered Design	Iteratively learning from and involving program clients.
Equity-Centered Design	Addressing biases in the enrollment process and facilitating the authentic engagement of clients from a variety of backgrounds.
User-Experience Design	Getting feedback from clients on a new proposed enrollment process.
Service Design	The experience of the client with the new enrollment process from the first engagement (e.g., a phone call or visit to a website) through their completion of the program.
Systems Thinking	Understanding how the new sign-up process fits into other service delivery channels and organizational culture.
HCD	Building empathy with clients and involving clients and stakeholders, such as frontline workers, program administrators, and program partners, throughout the design process.

Other non-design problem-solving approaches can be distinguished from, but integrated with, HCD.

There are also several non-design approaches to problem solving that may be seen as complementary to HCD (e.g., Agile, Lean Six Sigma). These approaches are meant to help solve a practical problem, take a new perspective to solve that problem, use iterative methods to address the problem, and/or obtain input from customers or end users.

These approaches may use some HCD principles or even integrate HCD as one framework within a larger approach. However, these approaches are more linear and structured than HCD and may focus heavily on efficiency (Kershaw et al., 2016). They often do not focus as much on end users as HCD (Liedtka & Salzman, n.d.). Table 4 defines each complementary approach and notes similarities and differences from HCD.

Table 4. Other Problem-Solving Approaches

Problem-solving approach	Similarities between approach and HCD	Differences between approach and HCD
Agile structures a project around "sprints" where teams work intensively for a brief time on a specific piece of the work and then come back together to determine if mid-course corrections are needed (Read, 2017; Serrador & Pinto, 2015).	Encourages collaboration via an interdisciplinary team and seeks to improve customer satisfaction (Read, 2017; Serrador & Pinto, 2015).	Focused primarily on project management; does not focus on the end user experience in the development process (Jungbeck, 2018); begins design and development at the same time (Read, 2017).
Lean Six Sigma is a performance improvement approach focused on defining a problem, engaging employees to analyze the root cause of the problem through data analysis, identifying solutions, and then documenting a revised process (Maleyeff, 2007).	Focused on taking the perspective of a customer or end user around a product, service, or problem (Innovation Training, n.d.; Purdue University, 2021).	Focused primarily on efficiency, which is not a central focus of HCD (Innovation Training, n.d.).
Continuous Quality Improvement (CQI) is a quality management process that (1) uses "aims and measures to achieve improvement," (2) allows for adaptations for local context based on what is learned, and (3) requires ongoing use of data to monitor changes (Rubenstein et al., 2014).	Requires ongoing iteration and accounts for the needs of the local context (Rubenstein et al., 2014).	Quantitative data is a more central feature of CQI than HCD. Also, CQI does not necessarily include an assessment by end users but often assesses progress through existing data (Institute for Healthcare Improvement, n.d.).
Breakthrough Series Collaborative (BSC) is a structured improvement methodology by which CQI processes are learned, embedded, and spread through an organization to improve practice and outcomes (Daily et al., 2018; Institute for Healthcare Improvement, 2003).	Multidisciplinary teams are formed to implement and revise solutions through iterative testing (Daily et al., 2018).	Uses research as the starting point for a solution, whereas HCD is rooted in deeply understanding the needs of end users and stakeholder (Daily et al., 2018).
Rapid Cycle Evaluation describes any learning process that includes quickly posing and answering questions; it is often compared to the use of more time-intensive randomized trials (Schneeweiss et al., 2015).	Rapid cycle evaluation uses a process that is cyclical and tests ideas quickly and adjusts if solutions are not sufficiently addressing the problem (Schneeweiss et al., 2015).	Rapid cycle evaluation does not necessarily use multidisciplinary teams and does not deeply focus on the needs of the end users.
Behavioral Diagnosis and Design is a problem-solving methodology rooted in behavioral economics (Richburg-Hayes et al., 2017). The purpose of this approach is to encourage people to enact desired behaviors (Richburg-Hayes et al., 2017).	The process is iterative and engages a multidisciplinary group to consider the entire end user experience (Richburg-Hayes et al., 2017).	The process may not include end users. Solutions are centered on behavior change, whereas solutions designed under HCD can be more varied.

Problem-solving approach	Similarities between approach and HCD	Differences between approach and HCD
Learn, Innovate, Improve (LI^2) is focused on program or process improvement using a cycle of learning, innovation, and testing of solutions (Derr et al., 2017).	LI^2 uses multidisciplinary teams and an iterative process that relies on understanding underlying needs, tasks, and environments of stakeholders (Derr et al., 2017).	In LI^2, the involvement of end users is not essential like it is in HCD. In LI^2, tested solutions are revised based on outcome data and may not include evaluations by end users (Derr et al., 2017).

The problem-solving approaches described in Table 4 can be seen as both distinct and overlapping. Each of these approaches could integrate HCD principles and each of these approaches could be integrated within HCD efforts. For example, someone may use process improvement approaches such as Agile and Lean Six Sigma to create efficiencies during the HCD process or use behavioral diagnosis and design to raise new insights. Evaluation approaches such as CQI and rapid cycle evaluation can be helpful when considering ways to test design solutions (e.g., using rapid cycle evaluation to test prototypes). Alternatively, principles of HCD could be incorporated into these alternative problem-solving methods. For example, if an organization is using behavioral diagnosis and design or LI^2, the team may choose to incorporate some of the empathy building methods used by HCD in the learning phase to enhance their diagnosis of the problem.

HCD Is Being Used in a Variety of Ways Within Human Services

To help further illustrate what HCD is, in this section we describe how HCD has been implemented within human services contexts. While we gathered literature from other fields, such as education and health to inform this brief, we focus the examples in this section solely on human services. First, we present three case examples to show how HCD has been used. Then, we summarize findings from across these case examples and others found in the literature, organized by 1) what types of organizations are utilizing HCD, 2) what training approaches are being utilized, 3) what problems or challenges are being addressed and what kinds of solutions are being designed, 4) how end users and stakeholders are being engaged, and 5) what methods are being utilized. We draw upon some examples several times. It is important to note, however, that data were not available to fully evaluate the extent to which all HCD principles were implemented in each of the examples we present below. Therefore, our assessment may not reflect full implementation as we have defined it above.

Three case examples provide in-depth perspective on the use of HCD in human services.

In this section, we describe the three human services programs we reviewed to provide examples of how HCD has been used. See Appendix A for more details about how these programs were selected.

Multnomah Idea Lab

Background	The Multnomah Idea Lab (MIL) is a learning laboratory within Multnomah County's Department of County Human Services (DCHS) in Oregon. The MIL began in 2015 and is charged with seeking policy and innovation approaches at the intersection of poverty and racism. They have three lines of business: equity and human centered collaborative design, critical thinking, and applied research. Their work includes consultancy within the County and with other local jurisdictions and testing new and research-based ideas to systematically eliminate racial wealth, asset, and income gaps. They have funded their HCD efforts through local government funding and philanthropy.
Problem to be addressed	HCD was used in a project called A Place for You, which aimed to provide housing stability for families experiencing homelessness and promote upward economic mobility.
HCD activities	MIL staff indicated that they obtained feedback from families experiencing homelessness, homeowners, and other stakeholders (such as people from local businesses) on solutions for addressing homelessness in the community. For example, they conducted surveys and held listening sessions. One idea that surfaced was the installation of small homes in the backyards of participating homeowners. They then developed iterations of potential designs for small homes with a local nonprofit focused on making better living spaces.
Outcomes	Through this process, two small home designs were developed. As a result, a small number of homes were provided to families experiencing homelessness, and as of early 2020, MIL staff continue to test and iterate on how well the solution is working for the families and homeowners one year after families began moving into the homes.

Central Susquehanna Intermediate Unit

Background	The Central Susquehanna Intermediate Unit is a local educational service agency located in Milton, PA that provides educational support, special education, Early Head Start and Head Start, adult education, migrant education, workforce development, and other services. Members of the Central Susquehanna Intermediate Unit staff were initially trained in HCD through a project sponsored by the Office of Family Assistance in ACF (Office of Family Assistance, 2015a). They continued using HCD and created a design team for a new initiative: Advancing Social Capital through Enhanced Networks and Training (ASCENT).
Problem to be addressed	HCD was used to grow social capital amongst adult clients pursuing healthcare related credentials, education, and careers.

Central Susquehanna Intermediate Unit

HCD activities	The ASCENT design team (which included end users; i.e., their clients) conducted surveys of end users; worked to define social capital through research, surveys, and discussions with end users and other stakeholders; and held focus groups with end users. They also used design thinking worksheets that helped the ASCENT design team iterate and refine their ideas by distilling the problem they were seeking to solve and thinking through the details of their solution.
Outcomes	The ASCENT design team developed three design solutions through this work: (1) peer ambassadors to build bridges between program administrators and participants, (2) in-person social capital activities through informal gatherings, and (3) virtual social support through text messaging and Facebook. The Central Susquehanna Intermediate Unit moved forward with implementation of the virtual social support solution.

Kentucky Governor's Office of Early Childhood & Kentucky Division of Child Care, in partnership with the University of Kentucky and Child Care Aware of Kentucky	
Background	The Kentucky Governor's Office of Early Childhood and the Kentucky Division of Child Care supported the use of HCD as a part of a larger effort to redesign their Quality Rating and Improvement System (QRIS) using Race to the Top Early Learning Challenge (RTT-ELC) grant funds. The Governor's Office of Early Childhood and Division of Child Care collaborated with the University of Kentucky to obtain expertise in HCD, who worked in partnership with Child Care Aware of Kentucky (Rous et al., 2016).
Problem to be addressed	This initiative sought to improve coaching to better meet the needs of childcare providers (Rojas et al., 2017). In particular, the state was looking for ways to ensure that the voices of childcare providers and coaches were heard, that providers' coaching needs could be met, and that coaches could improve their experience delivering professional coaching services.
HCD activities	The project team used HCD techniques with childcare providers to improve their experiences with coaching services, and with childcare coaches to improve their experiences delivering coaching services. The team utilized several HCD tools including user camera studies (taking and sharing photographs of end users' everyday activities) and empathy profiles (where individuals take the point of view of end users).
Outcomes	Three solutions were designed to support coaches in the delivery of their services: (1) Coachmeet, (2) a Coaches Toolkit, and (3) Coach Chat. Child Care Aware of Kentucky were partners in the prototyping process and ultimately launched these solutions. Coachmeet is a meeting for coaches and coaching staff to share promising practices. The Coaches Toolkit compiled the tips, tools, and information from Coachmeet sessions into an easily accessible online resource for childcare providers and coaches. Finally, Coach Chat was designed as a virtual way to support providers in feeling connected, respected, supported, and effective. At the time this brief was prepared, these solutions had been well-received by end users but experienced variable sustainability.

HCD is used at the local, state, and national levels.

HCD is being used in human services across local, state, and national levels, with federal support having been provided for several state and local initiatives. Examples of programs operating within and across these levels are as follows:

- **Local level.** Many programs are using HCD at a local level. Of the three programs in our case examples, two (the Multnomah Idea Lab and Central Susquehanna Intermediate Unit) operate at the local level. Many other local level entities, such as childcare centers and local government departments, have used HCD to solve problems (Chan, 2018; Public Policy Lab, 2018b; The Early Learning Lab, 2018).
- **State level.** Our review did not identify many HCD projects in human services occurring solely at the state level. One example of the use of HCD at the state level is a project supported through the Kentucky Governor's Office of Early Childhood and Kentucky Division of Child Care that used HCD to improve professional coaching to meet the needs of childcare providers, described above (Rojas et al.,

2017). This state office partnered with the University of Kentucky and Child Care Aware of Kentucky to use HCD to help address this issue.

- **National level.** Several federal U.S. government entities have used HCD. For example, the U.S. Department of Health and Human Services (HHS) used HCD under the Aim for Independence initiative to gain a deeper understanding of the experiences of clients that HHS serves (U.S. Department of Health and Human Services, 2019). The U.S. Centers for Medicare & Medicaid Services uses HCD to better design programs and services and improve outcomes for patients (U.S. Centers for Medicare & Medicaid Services Quality Payment Program, n.d.). In addition, the Office of Personnel Management's Innovation Lab ("The Lab at OPM") provides HCD training and supports HCD capacity building for federal programs, state and local programs, and private institutions (such as academic institutions and non-profits; The Lab at OPM, n.d.). Other HCD initiatives at the federal level have involved the federal government or philanthropies to address problems in areas such as early childhood education, veterans' affairs, and Medicare (Carey & Howard, 2009; Public Policy Lab, 2018c; Public Policy Lab, 2018d; Public Policy Lab, 2018e). HCD has also been used within human services work in other countries, such as in Denmark to address long-term unemployment and improve a government sponsored meal program; in Australia to support people experiencing homelessness; and more broadly across Europe through collaborations between innovation organizations, such as IDEO, and government (Kershaw et al., 2016; Liedtka et al., 2013; Melles & Howard, 2012).
- **National support for implementation at state, Tribal, or local levels**. We also identified two projects that were initiated at the U.S. federal government level, but implemented at local, state, or Tribal grantee levels. The Office of Family Assistance (OFA), a federal level office, partnered with three local-level grantees to solve challenges experienced by economic security programs (Office of Family Assistance, 2015a). On a larger scale, the U.S. Department of Labor's Employment and Training Administration supported the provision of customer centered design training to approximately 80 public sector teams at the local and state levels to help them improve service delivery for jobseekers and employers using career pathway services (Maher & Maher, n.d.).

In sum, HCD is being implemented across a variety of human services settings for a range of challenges or concerns. Local implementation appears to be most common, even when there is national support or training provided. This may reflect the nature of HCD, which is intended to center end users fully in the design process. In addition, these local organizations are partnering with design or innovation institutes with HCD expertise, such as IDEO, the Early Learning Lab, the Public Policy Lab, and the Lab at OPM. Finally, it appears that HCD initiatives are funded by a range of sources, predominantly by government and philanthropies.

HCD training approaches vary with regard to the role of external consultants.

In general, there are three ways in which organizations appear to obtain training and expertise for HCD implementation:

- **An external consultant leads HCD implementation:** Organizations may work with an HCD professional from an HCD firm, an organization that provides training in HCD, or from a university that offers a degree in HCD. Several examples have been mentioned above, such as the Lab at OPM and the Public Policy Lab in New York. These HCD professionals will facilitate the HCD process for the organization, leading the design team and helping to develop the solutions.
- **An organization receives training or coaching from HCD professionals:** HCD professionals with established expertise may also provide training in HCD with or without ongoing technical assistance to build HCD implementation capacity within a site. Although training is typically provided through in-

person workshops, online or virtual trainings in HCD have also been provided (Maher & Maher, n.d.); however, data are not available to determine how this method may impact participant learning.

- **An organization uses its own in-house expertise:** Alternatively, some organizations may develop their own in-house capacity to engage in HCD apart from any consultation or training from HCD professionals. For example, after identifying interest in utilizing HCD, an organization may hire an HCD expert to join their staff. Due to budget constraints, some organizations may also attempt to gain HCD knowledge and skills through self-taught methods.

Each approach has advantages and disadvantages. For example, relying entirely on a consultant to lead HCD efforts may be the most expedient way to implement the process and identify a solution, but it is likely costly and does not necessarily build in-house capacity to aid with sustainability. Likewise, while receiving training in HCD has the benefit of embedding knowledge in the organization for sustainability purposes, the implementation of HCD may be slower. As for the third method, there is growing interest in building internal capacity for HCD through the development of innovation labs within government (Brown, 2016) as well as independent innovation organizations (The Early Learning Lab, 2018). Using in-house expertise is also supportive of sustainability, but many human services programs may not have resources to hire someone with necessary skills. Finally, communities of practice have been developed to support peer learning around HCD (Maher & Maher, n.d.), which could support the implementation regardless of training approach.

HCD is being used to address a myriad of problems and develop different kinds of solutions.

We identified a variety of challenges that human services programs are addressing through HCD and novel solutions that are being developed. Although use of HCD in human services is still relatively new, examples of how human services organizations have begun to use HCD to improve their work span several areas, including economic security (Lekan, 2018; Kershaw et al., 2016), homelessness and housing (Community Solutions, 2022; Melles & Howard, 2012; Public Policy Lab, 2018a), early care and education (Chan, 2018; The Early Learning Lab, 2018), and employee engagement (Ruth, n.d.). These problems tend to be multi-faceted and do not have a straightforward solution (Kershaw et al., 2016).

Solutions developed through the HCD process vary significantly based on the problem the program is addressing. Programs may:

- **Develop a specific product**, such as the Facebook page for providers to access early care and education coaching support, supported by the Kentucky Governor's Office of Early Childhood, Kentucky Division of Child Care, the University of Kentucky, and Child Care Aware of Kentucky (Rojas et al., 2017),
- **Develop a new program**, such as La Clínica's nutrition and mental health curriculum, to be used and shared with the community by their community health educators (The Early Learning Lab, 2018), or
- **Improve an existing process**, such as the Public Policy Lab's work with the New York City Department of Homeless Services to set up new intervention points in the homeless shelter entry to exit journey to increase the likelihood of return to permanent housing (Public Policy Lab, 2018a).

An important finding from the resources we reviewed is that solutions developed through HCD may often differ from what the program expected the solution to look like at the start of the process. For example, one project began with a goal of updating the menu for a senior meal program, but through the design process they addressed many additional concerns of which project leaders were previously unaware, such as social stigma of receiving government-sponsored meals and a lack of control over meal choice. Ultimately, a solution was developed that allowed seniors to choose and have variety among their meals, added a guest menu so seniors could eat with a friend, and brought in a chef to work with kitchen staff to build upon their cooking skills (Liedtka et al., 2013).

Human services organizations are utilizing a variety of HCD methods.

Human services organizations are utilizing a variety of methods throughout the HCD process in a range of contexts, as illustrated by the following examples, which are organized by the five phases described earlier.

Research & Discover

To understand the perspective of the end user and build empathy, organizations have used methods like interviews, observations, stakeholder mapping, and literature reviews.

- The team from the University of Kentucky conducted **interviews** with childcare providers and coaches to learn more about each group's experience with the current coaching model.
- NiteBright, a program that used HCD to address the childcare needs of parents in San Francisco who work non-traditional schedules, conducted **interviews** and **observations** with childcare providers to understand their needs and difficulties (Chan, 2018).
- The Public Policy Lab used **stakeholder mapping** to better understand business owners' difficulties implementing requirements for disability accessibility in New York City (Public Policy Lab, 2019).
- Projects were also identified that use indirect or secondary research methods, such as **literature reviews** (Melles & Howard, 2012) or **reviews of current materials** in use by the program (Public Policy Lab, 2020).

Synthesize & Generate Solutions

To distill the findings from the prior phase and start brainstorming solutions, sites have used methods like character composites, user personas, journey maps, and design workshops.

- The team from the University of Kentucky **developed character composites** (fictious profiles of end users generated based on information gathered about real end users that include attributes such as age, education, hobbies, and strengths) to help them visualize and think from the perspective of the end user.
- Similarly, the HHS Aim for Independence initiative created **user personas** based on parent needs related to economic independence (Lekan, 2018).
- The Public Policy Lab, with New York City Department of Homeless Services, created **journey maps** of people experiencing homelessness to follow their experience from their entry into a shelter to their exit to identify points that may influence their likelihood of returning to permanent housing (Public Policy Lab, 2018a).
- Synthesis methods, such as those listed above, help distill findings so a design team can begin to create potential solutions. To develop solutions, some sites hold **design workshops** that include end users and different types of stakeholders, such as program staff, community members, and others (Chan, 2018; Public Policy Lab, 2018a).

Conceptualize and Prototype

To transform ideas into tangible solutions, programs have implemented methods like simple paper prototypes, collaborative design sessions, and storyboards.

- The team from the University of Kentucky and Child Care Aware of Kentucky developed a **simple paper prototype** of a proposed phone app, Coach Chat.
- In a project where the Public Policy Lab partnered with New York City's Department of Education to connect families with public benefits and services, **collaborative design sessions** were conducted with six schools to obtain input on the solutions that had been generated in earlier phases (NYC Department of Education's Office of Community Schools & Public Policy Lab, 2019).
- The grantees that partnered with the Office of Family Assistance to solve challenges in economic security programs used **storyboards** to visually represent how a solution would work (Office of Family Assistance, 2015a).

Test & Iterate

To evaluate and adapt the initial prototypes, programs have implemented pilot tests and gathered feedback.

- MIL's A Place for You project **piloted** their solution, placing small homes in homeowner's backyards, and **gathered feedback** on how the solution was working for the families and homeowners. Their initial testing indicated that their approach supported stabilization more quickly than the traditional rapid rehousing model. However, families living in the small homes expressed concerns, such as limited storage space, and homeowners were not interested in having the small homes on their property for more than 5 years.
- The NiteBright project tested their childcare co-op solution with three families in an existing childcare center during nights and weekends, with parents taking turns as teacher assistants (Chan, 2018).
- In the Office of Family Assistance's project, the Confederated Tribes of Siletz Indians tested their solutions for improving participation in departmental meetings (such as "moving the meeting site, incorporating tribal culture […], and reviewing confidentiality agreements"; Office of Family Assistance, 2015a). They received feedback during their meetings that they used to further iterate and test again in later meetings (Office of Family Assistance, 2015a).

Implement & Refine

Finally, programs implement their solution, with exact methods varying depending on the nature of the solution.

- As part of the Good Kitchen's solution to improve their government-sponsored senior meal delivery program, they provided a training with a chef for the kitchen staff, provided staff with new uniforms, provided customers with comment cards to share meal suggestions, and began publishing a newsletter (Liedtka et al., 2013).
- The Kentucky Governor's Office of Early Childhood and Kentucky Division of Child Care project, in collaboration with the University of Kentucky and Child Care Aware of Kentucky, launched their solution, CoachChat, as a Facebook group with a chat function to allow childcare providers to directly communicate with coaches.

Based on our review, it appears that some methods are being used in human services practice more than others. For example, interviews with end users, observations, and design workshops were utilized in several initiatives we identified, whereas other methods, such as diary studies, affinity diagramming, and role-playing solutions were less evident. Also of note, many of the examples identified through this review had not yet reached the implement and refine phase of the design process or did not have information available about the implementation of their solutions.

Evaluation of HCD Is Limited, but Implementation Studies Suggest Promise for Organizations

Anyone interested in using HCD will want to know what is reasonable to expect with regard to both the implementation of HCD as well as potential outcomes. For example, are there specific indicators that show HCD is being implemented well? Do these factors translate into positive outcomes for staff engaged in HCD, as well as for the end users and the problem being addressed? Although current evidence is limited overall, there are some emerging findings from recent studies that can help to address these questions. In particular, we have identified a number of factors that appear to facilitate HCD implementation and indicators of organizational change that we describe in this section.

There are, nonetheless, several challenges and limitations to the studies we identified and reviewed. One of the main barriers to rigorous research in this area appears to be a lack of any clear theory of change for HCD that might inform how to measure the implementation of HCD and its outcomes, along with a lack of standardized measures. Knowledge of implementation is based primarily on case studies, which have limited generalizability and cannot determine with confidence if outcomes can be attributed to any particular indicators or actions. Studies about HCD's effectiveness for solving problems as compared to traditional problem-solving methods are even more limited, such that we could not draw any reliable conclusions. Thus, we focus on HCD implementation evaluations in this section despite these limitations.

We identified approximately two dozen resources on this topic: implementation evaluations of HCD projects and evaluations that examined organizational changes associated with participating in the HCD process (e.g., changes to mindsets or approaches to work). In this section, we first describe the evaluation methods and measures used, and then we summarize findings from evaluations that examine the implementation of HCD and those that assess organizational changes related to the use of HCD.

Most knowledge about HCD is based on case studies.

The most common design used to evaluate HCD implementation is case studies. These case studies describe how HCD was implemented in a particular place, facilitators of the process, challenges, and/or lessons learned (Davis & LaFond, 2016; LaFond & Davis, 2016; Lin et al., 2011; Measured Lab, Inc., n.d.; Vechakul et al., 2015). In general, qualitative methods, such as surveys, interviews, and observations were used to craft the case studies. This approach also supports telling a "story" about the HCD process, as recommended by Schmiedgen et al. (2016).

What an evaluation of HCD implementation looks like depends on the purpose of the evaluation. Some important considerations include whether the focus is on a particular aspect of HCD vs. HCD as a "unified concept," the unit of analysis (e.g., individuals, teams, or organizations), and the time period for assessment (Liedtka, 2014; Liedtka et al., 2018). Consistent with the HCD approach itself, some implementation evaluations engage end users and stakeholders and allow for modifications to the study design to reflect the fact that the HCD process itself changes over time (Measured Lab, Inc, n.d.; NYC Opportunity, 2017).

Practitioners and researchers have measured HCD implementation in different ways.

The literature lacks valid and reliable tools specifically aimed at measuring HCD implementation, despite growing recognition of the need to document and evaluate HCD (LaFond & Davis, 2016; LaFond & Davis, 2017; Liedtka et al., 2018; Schmiedgen et al., 2016). Nearly all measures used in the HCD implementation studies identified appear to have used investigator-designed measures, such as unique surveys and interview guides. In addition to the emergent nature of the HCD field, this may also reflect challenges in measuring amorphous concepts like a "mindset" (Schmiedgen et al., 2016).

While there are no validated measures of the HCD process, evaluators may be interested in the constructs and measures that have been examined or suggested for studies on this topic (see Table 5).

Table 5. Examples of How HCD Can be Measured

Construct	Examples of measures
HCD activities	• Number of people trained (Schmiedgen et al., 2016) • Methods used (Bazzano et al., 2017; Davis & LaFond, 2016; Kanagat & LaFond, 2018; Helminiak, 2016; LaFond & Davis, 2016; Measured Lab, Inc., n.d.) • Number of participants in the process (Measured Lab, Inc., n.d.; Elmansy, 2018)
Quality of implementation	• Participant engagement or enthusiasm (Lin et al., 2011) • Consideration of multiple design solutions (Liedtka, 2014; Royalty & Roth, 2016) • Level of engagement with end users (Liedtka, 2014; Royalty & Roth, 2016; Measured Lab, Inc., n.d.)

Construct	Examples of measures
Outcomes of HCD implementation	• Development of a new idea or implementation of a new project (Bazzano et al., 2017; Helminiak, 2016; Liedtka et al., 2018; Schmiedgen et al., 2016) • Novelty and value of an idea (Royalty & Roth, 2016; Liedtka, 2014) • Engagement, collaboration, and motivation among those involved in the HCD process (Liedtka et al., 2018; Helminiak, 2016; Schmiedgen et al., 2016) • Self-efficacy and confidence among those involved in the HCD process (McLaughlin et al., 2019; Measured Lab, Inc. n.d.).

Studies suggest how to facilitate HCD implementation and what organizational changes could be expected.

Many facilitators of HCD have been identified.

The literature on HCD provides insight into facilitators and lessons learned. The literature on HCD evaluation primarily describes how HCD was implemented, such as who was on the design team, the organizations involved, what activities were undertaken, and who was engaged (Bazzano et al., 2017; Davis & LaFond, 2016; LaFond & Davis, 2016; Liedtka, 2017; Liedtka et al., 2018; Lin et al., 2011; Measured Lab, Inc., n.d.; Vechakul et al., 2015). The most salient findings are summarized as follows:

- **Leadership**. Strong leadership, as opposed to passive support, facilitates successful HCD implementation and helps mitigate several challenges (Liedtka et al., 2018).
- **Buy-in.** It is important to obtain buy-in from those involved in the HCD process to ensure full engagement and successful implementation (Lin et al., 2011).
- **Time and effort.** HCD processes are time consuming, taking many months to a year or more (Davis & LaFond, 2016; LaFond & Davis, 2016; Liedtka et al., 2018; Lin et al., 2011; Public Policy Lab, 2018d), but may contribute to efficiencies over the long-term (Forrester, 2018).
- **Design team characteristics.** Design teams may benefit from 1) a strong facilitator to ensure the HCD process moves forward and achieves its goals (Liedtka, 2017), 2) a diversity of perspectives (Vechakul et al., 2015; Liedtka, 2017), and 3) a "shared lexicon" (Liedtka, 2017).
- **Collaboration**. Collaboration with end users and stakeholders is essential throughout the entire HCD process, not just at the beginning (Davis & LaFond, 2016).
- **Coaching**. Ongoing coaching from design experts may be needed to foster successful HCD implementation (Liedtka et al., 2018).

HCD may contribute to positive organizational changes.

There is also a body of literature on how HCD implementation is associated with organizational processes and promotes an HCD "mindset." Although existing studies have not used designs that include a control or comparison group, which precludes causal interpretations, the following were noted multiple times in relation to HCD:

- **Empathy**. The design team (and their organizations) may gain a greater understanding of end users, which is described as contributing to the development of better solutions (Davis & LaFond, 2016; LaFond & Davis, 2016; Vechakul et al., 2015; Liedtka et al., 2018).

- **Innovation**. The HCD process may lead to more innovative solutions through new ways of identifying challenges, reframing the problem, and embracing ambiguity (Liedtka, 2017; Vechakul et al., 2015).
- **Engagement, confidence, and self-efficacy**. HCD may empower design team members to create solutions (Measured Lab, Inc., n.d.) and enhance design team member engagement in their work (Davis & LaFond, 2016; Liedtka et al., 2018).
- **Community engagement**. HCD brings together stakeholders who may not normally work together, which may contribute to stronger community connections (Vechakul et al., 2015; Liedtka, 2017).
- **Collaboration and openness to various perspectives**. HCD illustrates what can be accomplished when individuals with a variety of perspectives come together to solve a problem, which may promote collaboration across the organization (Liedtka et al., 2018; Measured Lab, Inc., n.d.).

Given the emergent nature of HCD, there is limited information available on evaluations of HCD implementation (Bazzano et al., 2017; Liedtka, 2017; Liedtka et al., 2018; Measured Lab, Inc., n.d.). As mentioned above, there is no widely accepted theory of change or clear core components that might be expected to lead to improved outcomes for organizations and end users. In addition, there is a lack of validated measures that are necessary to increase confidence in results and support broader learning in the field. Nonetheless, existing work appears to be identifying critical constructs that can be further evaluated in more rigorous research that tests hypotheses and contributes to building theoretical models of change.

Sustainability of HCD Within Human Services Has Not Been Well-studied

Given that human services programs face many constraints, including time and money, it is important to consider whether the investment in HCD is something that might provide long-term benefits for human services organizations if they sustain the process and/or mindset. Unfortunately, in our review we found few resources that addressed this specifically, although we obtained insight from two of our case examples.

Evidence of sustainability includes:

- Some organizations have continued to seek input from participants (Singh, 2019).
- As mentioned above, some organizations enhanced their capacity for innovation (The Early Learning Lab, 2018), which can promote sustainability.
- Some organizations continue to use HCD as a tool in efforts that go beyond the original use of the HCD process (Carey & Howard, 2009; LaFond & Davis, 2016; Li et al., 2017; Vechakul et al., 2015).

Sustaining HCD may be challenging.

Sustainability of HCD processes can be limited due to resource and time constraints (Righi & James, 2007; Singh, 2019). HCD is time consuming since it involves engaging with more individuals than is typically the case when designing something new, taking the time to truly understand the problem, and trying many potential solutions. The time and financial resources to do this work can be limited, especially in human services organizations, which makes sustainability a challenge (Singh, 2019). On the flip side, HCD is believed to contribute to efficiencies once it is embedded within an organization, since the process may lead to better solutions (Forrester, 2018).

Supportive organizational environments may help sustain HCD.

Sustainability of HCD may be facilitated by a supportive organizational environment (Allio, 2014; Liedtka & Salzman, n.d.). In particular, the following factors have been identified as contributing to sustainability:

- Support of creative thinking and innovations that may run counter to current practice (Allio, 2014; Singh, 2019);
- Embedding the HCD mindset into workplace culture as part of staff's existing routines (Allio, 2014);
- Continued allocation of time and other resources (Singh, 2019); and
- According to the experts we engaged, the presence of a champion within the organization who can continue to drive implementation of HCD.

As described above, the act of implementing HCD can impact organizations in terms of innovative thinking, increased empathy, and more. The perceived impacts of implementing HCD can, therefore, promote its sustainability.

Summary and Conclusion

Human-Centered Design (HCD) is relatively novel in human services, but appears to have potential for addressing complex challenges faced by human services agencies. This brief aimed to increase understanding of HCD in this context through review of over 200 resources and examination of three human services programs that have implemented HCD. Findings are limited by the emergent nature of this field, with predominantly qualitative case study reports and descriptions of initiatives on program websites. Not only does this preclude any conclusions about the effects of HCD, it also makes it difficult to evaluate the extent to which HCD—as defined in this brief—is actually being implemented in the field. There are nonetheless several key findings that may be useful to consider:

- HCD is both a process and a mindset for addressing complex problems by designing solutions with those who will ultimately utilize the solution (i.e., end users).
- HCD is characterized by six key principles: understand end users and stakeholders, engage with end users and stakeholders throughout, test and revise solutions based on end user feedback, iterate, consider entire experience, and collaborate across disciplines.
- There are five HCD phases: research and discover, synthesize and generate solutions, conceptualize and prototype, test and iterate, and implement and refine.
- HCD is being utilized for many challenges across a range of human services programs.
- HCD is being implemented primarily at a local level, often with government or philanthropic support, and in consultation with a design firm or institute that provides training and expertise.
- Most organizations are in the early stages of implementation. An HCD mindset develops over time through engagement with the HCD process and could be thought of as a long-term outcome of the process. Given the novelty of HCD within human services, at this time there are more resources available on the process of HCD than on the HCD mindset.
    - Organizations implementing HCD are utilizing a variety of methods across all phases of the HCD process, such as interviews, observation, design workshops, and pilot studies.
    - Human services organizations report the process of obtaining input directly from end users is quite valuable, and often leads to new, unexpected solutions.

- Organizations implementing HCD have reported positive changes in the design team's mindset, exemplified through increased empathy, innovation, community engagement, and collaboration.
- HCD implementation studies suggest that important facilitators include 1) strong leadership; 2) buy-in from stakeholders; 3) a design team with a strong facilitator, diversity of perspectives, and shared language; and 4) ongoing coaching. Successful implementation also requires time, effort, and collaboration.

- HCD's sustainability in human services is unclear. HCD processes have been sustained within some organizations, particularly where there is strong support from leadership. However, resource and time constraints are key barriers to sustaining HCD within an organization.
- Although evaluations of HCD are largely descriptive, several efforts have been made to advance the measurement of HCD activities, implementation quality, and organizational outcomes. Lack of validated measures of the HCD process has limited progress in this area.
- Much remains to be learned about if and how HCD actually improves the challenges being addressed in human services.

It is likely that the full potential of HCD in human services has not yet been met. That is, the resources reviewed suggest that current practices described here did not always reflect the full HCD process as defined, with regard to adherence to all six principles and full implementation of all phases. This may be due, in part, to a lack of understanding and/or agreement in the field about these key components, limited experience organizations have had with this approach to date, and the amount of time it takes to fully implement HCD within the human services context. Inadequate implementation could decrease the likelihood that organizations may achieve an HCD mindset over time, which is described as critical to the long-term success of this approach. Suggestions for enhancing implementation include:

- Establish a set of HCD best practices and promote their widescale adoption by HCD firms, innovation labs, and expert consultants. Educate interested organizations in their use.
- Conduct more rigorous research based on clearly defined theoretical models of change with measures of key constructs that can be validated across contexts.

A pilot study is underway to advance this work.

To examine the feasibility of the HCD process in human services contexts more systematically, the project team conducted a pilot study with three sites in 2021: Denver Human Services; Santa Clara Social Services Agency; and the Washington State Department of Social and Health Services, Division of Child Support. These three sites were trained and coached in the implementation of HCD, while participating in a process evaluation. This pilot study will provide additional tools and measures for evaluating HCD within human services that can support more rigorous research in the future. Results will also support development of a theory of change for how components of the HCD process may lead to improved outcomes for organizations and end users. A full report of the pilot study findings will be available in 2022.

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Appendix A: Research Methods

To define HCD and the current state of the field as it is relevant for human services programs, we undertook two complementary activities: (1) a literature review, and (2) an in-depth review of case examples in three human services programs that have used HCD to solve a problem in the past. To inform this work, we engaged a group of seven consultants with expertise in HCD implementation and evaluation. In consultation with ACF, we identified these experts based on their expertise in HCD and human services. These experts included HCD researchers as well as individuals with design expertise (also known as design practitioners) at various levels of government and in the private sector. They contributed expertise in identifying literature and programs, as well as in interpreting findings.

Literature review

Given the emerging nature of HCD within human services, the project team took a broad approach to the literature review to capture knowledge from research as well as practice. We identified resources in several ways, including conducting searches on Google and Google Scholar, reviewing resources referenced within identified literature (i.e., snowballing technique), and resources identified by ACF staff and expert consultants.[10] The project team primarily targeted resources within the areas of human services, education, health, and government. However, resources that fell outside of these areas (such as in business and technology) were also considered for additional context. Resources included peer-reviewed publications, government and non-profit reports, briefs, websites, white papers, gray literature (e.g., blogs, fact sheets, working papers, conference proceedings, etc.), and other documents from both research and practice. In total, the project team reviewed over 200 HCD and related design resources, many of which were organizational reports or program descriptions on websites, rather than peer-reviewed publications.[11]

Search terms fell into the following categories:

- *Information relevant to defining HCD* such as human-centered design, user-centered design, and design thinking.
- *HCD in the context of human services*. We paired HCD-related terms with the following terms to identify resources that focused on ACF's priority areas for this project: early childhood education, healthy marriage, responsible fatherhood, child welfare,[12] child care, Head Start, and Temporary Assistance for Needy Families (TANF).
- *Similar design approaches* (e.g., service design, participatory design) in the context of human services to capture resources that may describe HCD approaches but use a different term to describe it. These search terms also allowed us to compare HCD with these other approaches. Searches for similar design approaches also included the terms listed above from the ACF priority areas.
- *Other non-design problem-solving approaches that can be complementary to HCD* (e.g., Agile, Lean Six Sigma, etc.)

[10] Due to limited resources, the project team reviewed all resources in the first two pages of search results for each search conducted and assessed resources for their relevance to this project.
[11] Although we identified many resources, not all were selected for inclusion in this brief. We targeted resources for inclusion based on their applicability to answering our research objectives.
[12] At OPRE's request, searches were conducted with and without "child welfare" included, as child welfare was not a targeted area, but yielded more resources.

The search terms "*Human-Centered Design*," "*User Centered Design*," and/or "*Design Thinking*" yielded the greatest number of resources. No resources were identified using the following design terms in combination with ACF priority areas: *codesign*, *service design*, *design*, *user centered approaches*, *person centered approaches*, *patient centered approaches*, *customer experience design*, *and systems thinking*. As a result, some of these terms are not referenced in this brief.

Case examples of HCD used within three human services programs

To learn more about HCD implementation within human services, the project team identified three human services programs with HCD experience and conducted a document review and interviews with their key staff. Programs were identified through the literature review and by the expert consultants based upon the following priorities:

- Focused on economic security, healthy marriage and responsible fatherhood, or early care and education;
- Used HCD within the past five years;
- Used HCD to help improve services, rather than just to improve technology;
- Potential to address sustainability and evaluability of HCD.

We selected the following three sites:

Programs we Engaged

- **Multnomah Idea Lab:** The Multnomah Idea Lab (MIL), which is housed within the Multnomah County Department of County Human Services in Oregon, is a learning laboratory, which is a dedicated unit focused on developing innovative solutions to problems. The MIL is housed in a human services agency, whereas innovation labs are typically housed within information technology or data departments. The MIL has used HCD to address problems at the intersection of poverty and racism.
- **Central Susquehanna Intermediate Unit:** The Central Susquehanna Intermediate Unit is an educational service agency located in Milton, PA that provides educational support, special education, Early Head Start and Head Start, adult education, migrant education, workforce development, and other services at a local level. They have used HCD to promote economic mobility among individuals receiving public benefits.
- **Kentucky Governor's Office of Early Childhood & Kentucky Division of Child Care, in partnership with the University of Kentucky and Child Care Aware of Kentucky**: The Governor's Office of Early Childhood is a statewide organization that provides leadership for Kentucky's early childhood system through strategic messaging, workforce support, collaboration, and more. The Division of Child Care supports child care programs in the state. They have supported projects that utilize HCD to improve the coaching of early care and education providers.

To examine how HCD methods were utilized in each site, we engaged in the following activities:

1. **Document review.** We reviewed documents related to each site's HCD work that reflected their process, products, and any reports.
2. **Interviews with key individuals involved in the HCD work.** Utilizing information learned through the document review, the project team interviewed core team members involved in each site's HCD process using a discussion guide to assess how they addressed their problem(s), challenges encountered, the sustainability of their efforts, and any evaluation approaches they utilized.

Based on the information we obtained, we identified key themes related to how each site implemented HCD. Our takeaways are embedded as case examples throughout this brief.

Appendix B: Toolkits

The following toolkits may of be interest to human services organizations seeking to engage in HCD.

Toolkit name	Description	Phases addressed	Additional relevant information
18F Methods (18F, n.d.)	Focuses on digital service design but can be adapted to other design projects.	**Fundamentals**: Government-specific and industry best practices to prepare for successful research. Should be used prior to engaging in the design process (*this is a pre-design phase) **Discover**: Get to know users and stakeholders **Decide**: Develop a design hypothesis **Make**: Create testable designs **Validate**: Test designs developed	Each method is described in detail and includes information about who should engage in the activity, and how long each activity will take to complete.
Atomic's Design Thinking Toolkit (Crawford, 2017)	A brief description of design thinking and collection of design thinking methods.	**This toolkit does not address specific phases.**	This toolkit was designed to be used by anyone interested in learning how to facilitate design thinking methods and does not require an HCD professional to use. The toolkit also provides information on the materials that are needed to complete the techniques outlined, which include supplies such as a large room, whiteboards, post-it notes, a projector, and a camera. Each method in the toolkit includes more specific details on the amount of time it takes to complete the method and who should participate (and the number of participants).

Toolkit name	Description	Phases addressed	Additional relevant information
AT-ONE (Clatworthy, 2011; Clatworthy, 2012)	An approach to focusing on user experiences in the early phases of service design through a series of workshops that focus on one of the letters of AT-ONE.	**A – Actors:** Brings together new groups of people, like users and stakeholders to solve a problem **T – Touchpoints:** Identify key touchpoints with users and stakeholders and design consistent experiences across touchpoints **O – Offering:** Service offerings are a communication of an organization's brand **N – Need identification:** Identify needs of users and stakeholders and how well an organization is meeting them **E – Experiences:** Designing desired customer experiences	
BIF's Design Methodology (Business Innovation Factory, 2018)	BIF's design methodology and toolkit promote transformation through involvement from all parts of an organization.	**Shift:** See opportunities for design through users' and stakeholders' perspectives **Conceptual Design:** Develop concepts for new user and stakeholder experiences **Prototype & Test:** Create and test prototypes **Commercialize:** Implement design solution	

Toolkit name	Description	Phases addressed	Additional relevant information
Collective Action Toolkit (Fabricant et al., 2012)	A design-thinking toolkit meant to enable local communities to design and create solutions.	**Clarify your goal**: Determine problem to solve **Build your group:** Create design group and identify group members' strengths **Seek new understanding:** Engage with community members to gain additional perspectives **Imagine more ideas:** Generate design solutions, then narrow focus to achievable solutions **Make something real:** Test ideas **Plan for action:** Generate concrete tasks to achieve shared goals	
Designing Methods for Developing Services (Davies & Wilson, 2015)	An introduction to using design methods in developing human services meant to introduce people unfamiliar with design to the design process.	**Discover**: Identify user and stakeholder needs to inspire preliminary ideas **Define**: Determine design challenge to be addressed **Develop**: Generate, improve, and refine solutions **Deliver**: Finalize and launch product or service	This resource includes information for individuals new to services design on what to expect when working with a designer, as well as information for designers on how to introduce the methods in the tool to others.
DIY Toolkit (Keane et al., n.d.)	A collection of HCD tools that are used and considered useful by social innovation practitioners.	This toolkit does not provide specific phases but includes resources to help one **(1) look ahead, (2) develop a clear plan, (3) clarify priorities, (4) collect input from others, (5) know the people, (6) generate new ideas, (7) test and improve, and (8) sustain and implement.**	This toolkit was designed to be self-guided. Each method in the toolkit includes information about the level of involvement or time it takes to complete the method, ranging from just a short period of time to over several days.

Toolkit name	Description	Phases addressed	Additional relevant information
Equity-Centered Design Framework (Anaissie et al., 2016)	An update to the Stanford d.School HCD model that reframes the design thinking process with an equity-centered lens using two additional phases, Notice and Reflect, that are incorporated throughout the original five phases.	**Notice**: Designer self-reflection on their own identity, power, and biases and acknowledgement of what they don't know to prepare to authentically connect with, and empathize with, users and stakeholders **Reflect**: Reflect on the design thinking process to understand your impact on users and stakeholders, share your learning, and understand what you could do better	This toolkit was created for designers to promote equity in the design process. This is meant to be used with the other d.school materials. To incorporate the equity-centered design framework, designers should expect to add 15-90 minutes on top of their existing design work.
Intergalactic Design Guide (Heller, 2018)	A guide to the principles, process, and essential skills for social design across diverse fields.	**Why are we here, and what are we trying to do? –** Identify the needs of users and stakeholders, and purposes of this process **What's the context? –** Research and learning through immersion in user and stakeholder experiences **What are the preconditions for success, and how will we know it? –** Understand conditions that need to be met to achieve desired outcome and indicators that those conditions have been met **What actions can we take to get there? –** Generate ideas **Does it work? –** Evaluate impact to inform next steps	
Luma (Luma Institute, 2012)	Describes 36 methods for implementing HCD.	**Looking**: Observing human experience **Understanding**: Analyzing challenges and opportunities **Making**: Creating future solutions	

Toolkit name	Description	Phases addressed	Additional relevant information
Mozilla Open Innovation Toolkit (Mozilla, n.d.)	A community sourced collection of HCD methods.	**Gather Insights**: Understand users' and stakeholders' experiences to generate useful and desired products **Ideate**: Generate ideas and refine the most promising ideas **Prototype and Test**: Create models of ideas to test, evaluate, and improve products	
Stanford d.School, Design Thinking Bootleg (Doorley et al., 2018)	Originally designed for d.School graduates, the design thinking bootleg was edited into a guidebook by the school for the general population interested in design.	**Empathize**: Observe, engage with, and immerse yourself in the experiences of end users and stakeholders **Define**: Identify a problem to solve **Ideate**: Generate design solutions and begin to think about prototypes **Prototype**: Generate ideas and test solutions with end users and stakeholders **Test**: Evaluate solutions	The methods are meant to be similar to a set of cards, and those using the toolkit may select which card they would like to use.
The Field Guide to Human-Centered Design (IDEO) (IDEO, 2015)	Offers 57 design methods, worksheets, and case studies.	**Inspiration**: Learning about user and stakeholder needs **Ideation**: Generate possible solutions **Implementation**: Market and implement a solution	
This is Service Design Thinking (Stickdorn & Schneider, 2012)	An introduction to service design for beginners.	**Exploration (Discover):** Identify the underlying problem **Creation (Concept Design):** Generate design ideas **Reflection (Prototype):** Build on and test ideas **Implementation (Implement):** Implement new service	

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