Evidence Based Library and Information Practice

Commentary

From Solving Puzzles to Designing Solutions: Integrating Design Thinking into Evidence Based Practice

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Introduction

With the rapid evolution of technology, coupled with changing customer needs and expectations, businesses, communities and even society as a whole, are facing increasingly complex challenges. Many of these challenges did not exist five – or even two – years ago. Libraries, with their reliance on technology and focus on customer service, are by no means immune to these complex challenges. Retrofitting existing solutions not designed to handle such complexity is no longer sufficient. The design literature calls these "wicked problems" (Rittel & Webber, 1973) which require new solutions be designed to suit their "wicked" nature. For example, to date the purchase and circulation models for ebooks has failed significantly as libraries and ebook vendors have focused on traditional circulation models and attempted to retrofit these models to materials that are, by their very nature, different from print collections. As a result, the features of electronic books – such as, for example, the ability of numerous patrons to borrow them concurrently – have not been exploited. As libraries of all types grapple with increasing proportions of their collections moving to electronic format, a new approach to the complex problem of ebook management is needed. This requires an agile, flexible and

human centred approach to create sustainable and scalable solutions adaptable to the rapid pace of change.

Evidence based practice (EBP) has been touted as one method for problem solving, particularly within health care and libraries. It focuses on using evidence for decision-making, and locates the evidence base within literature (Eldredge, 2004). While literature can provide grounding, it is not sufficient to give insights or determine solutions to wicked problems where radical innovation and agility is required. EBP focuses on solving "tame" problems - problems that can be analyzed and understood in order to devise an appropriate solution, such as solving puzzles or algebra (Stompff, 2010). In relation to libraries, an example of a tame problem would be the introduction of a new physical format such as DVDs. The problem could be understood and analysed within the library context and an appropriate solution devised. This new format still fit within the existing system; however, it required some thoughtfulness regarding policies and processes. It was akin to puzzle solving rather than problem solving.

In contrast to EBP with its focus on tame problems, design thinking focuses on solving complex and wicked problems, where there is often little or no precedence. Design thinking, in its simplest form, is an approach for solving business problems, similar to the way designers approach design problems (Dunne & Martin, 2006). It is a human centred rather than literature focused approach that is collaborative and participatory by nature. This enables it to be more agile and produce more innovative, scalable, and future focused results than EBP.

Incorporating design thinking principles and tools into EBP has the potential to move its applicability beyond tame problems and continuous improvement, toward wicked problem solving and innovation. This paper proposes a hybrid approach to maximise the strengths of the two methods for designing solutions to wicked problems.

What are Wicked Problems?

The term "wicked problems" was coined by Rittel & Webber (1973) in reference to the complexity of problems in social planning. Over time, it has been adapted to fit within a wider perspective to more generally address problems that are both ill-structured and ill-defined. Wicked problems are a class of complex social system problems, which are "ill formulated where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (Churchman, 1967, 141). They are unique, with complex interrelationships and interdependencies because the clients, stakeholders and context are different for each problem and subject to continuous change.

If we consider wicked problems within a library context, we start to see each book or resource as part of a much more complex and macro system – one resource as part of one collection within a library that is situated within a community, which in turn is situated within a city, and so on. Each level of the system has varying interrelationships and interdependencies between objects, spaces, environments, and people. The notion of wicked problems acknowledges the unique context of the problem and takes a holistic view to develop a customized solution (Rittel & Webber, 1973).

Where problems are wicked, new solutions appropriate for the context need to be developed. EBP is insufficient to allow for designing appropriate solutions. EBP is akin to solving a puzzle, with the assumption that there is just one solution, the pieces of which can be found in the current narrowly defined literature-focused "evidence base". This evidence base needs to be diversified in order to design new solutions for the wicked problems faced by libraries (Partridge, 2011; Koufogiannakis 2011; Pan and Howard, 2009). This represents a shift from *finding* a solution to *designing* solutions. Within this concept,

design thinking brings a unique way of looking at problems and designing solutions (Stompff, 2010).

Design thinking for problem solving

Design thinking is an approach for problem framing and solving which can be applied to tangible products as well as intangible services and systems (Buchanan, 1992; Kimbell, 2009). It denotes a collaborative and human centred problem solving approach using a design mindset to solve wicked problems. A design mindset refers to the perspectives and mental processes designers move through during the act of designing (Cross, 2006).

Brown's (2008; Brown & Wyatt, 2010) design thinking process consists of three stages: inspiration, ideation, and implementation (see Figure 1). It is a non-linear approach so, while there are definite stages, there is no predetermined manner in which these should be navigated. Instead, Brown (2008) suggests considering the phases as a system of spaces to move through, back, and between for iterative purposes throughout the process. Rather than steps, these spaces demarcate related activities.

For Brown (2008), inspiration considers the context and circumstances that motivate the search for solutions. This involves spending considerable time on problem finding, leading to the iterative design of a solution that takes into account the complex systems in which the problem resides. Ideation is the process of generating, developing, and testing ideas that may lead to new solutions; and implementation is the development of the product to market. This approach provides a valuable framework for considering design from problem acknowledgement and definition through to final problem resolution.

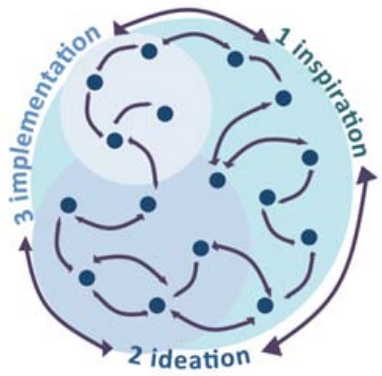

Figure 1
Design thinking process (adapted from Brown, 2008).

Over the past decade design thinking has been increasingly used as an innovation approach across a number of industries including business and management (Brown, 2008; Dunne & Martin, 2006), healthcare (Brown, 2008; Duncan & Breslin, 2006), library and community services (Bell, 2008) and social innovation (Brown & Wyatt, 2010). Design thinking has evolved to be considered a purposeful human centred design approach for innovation and change making for individual, community, and societal benefit, which can be applied within any number of contexts. Due to its social and participatory nature, it has great potential for agility and to produce radical innovation rather than incremental improvement as per EBP.

Comparing design thinking and evidence based practice

Both EBP and design thinking can be imagined in comparative stages (see Table 1). There are similarities in the purpose of the stages, however differences lie in the approach and activities of each. For example, within the first phase, both methods emphasize the importance of asking or addressing the right question. The manner in which this is achieved differs remarkably between the two. For EBP the problem is first constructed into a question followed by searching for the "best available evidence", which may be published or unpublished literature or other "authoritative resources" (Eldredge, 2000, 291). The evidence is then appraised for relevance to the problem.

For design thinking, the inspiration phase draws evidence from both primary and secondary sources and is grounded in the contextual local data. This involves observing

Table 1
Phases of Evidence Based Practice and Design Thinking

Evidence based practice (Booth, 2004)	Design thinking (Brown, 2008)
Define the problem	Inspiration (problem finding, research, insights)
Find evidence	
Appraise the evidence	
Apply results of appraisal	**Ideation** **(brainstorming, prototyping, testing)**
Evaluate change	Implementation (execution, evaluation, evolution)
Redefine the problem	

customers, interviewing and conducting workshops with stakeholders, understanding the organization's vision, locating the problem within industry trends, and may include consulting the literature. The focus is on understanding human behavior, needs, and values. All of this data is then synthesized in order to understand the problem from a holistic perspective and construct a question. In this way, design thinking is heavily human centred, and uses participatory methods to gather and understand data.

Where EBP determines a solution based on the appraisal of the evidence, implements it, and then evaluates the result, design thinking uses the results of the inspiration phase to brainstorm and ideate multiple futures and solutions. A selection of these are prototyped and tested with customers and stakeholders for evaluation and feedback. Solutions are then iterated and refined as needed prior to implementation. This ensures the solution is viable, feasible, caters to the required human needs and ultimately resolves the problem.

An understanding of the two methods determines that EBP focuses heavily on deductive thinking for decision making, whereas design thinking uses inductive, deductive and abductive, "leap of faith" (Martin, 2009) thinking to generate solutions. Design thinking is a holistic, whole-brained approach that seeks to understand the many interrelationships as well as the qualitative and quantitative aspects involved, whereas EBP takes a dominantly logical, analytical, left brained approach to decision making.

A hybrid model

This paper proposes a hybrid model (Figure 2) integrating the most valuable aspects of both EBP and design thinking to provide an agile and rigorous approach for wicked problem solving. There are six stages in this hybrid model: define the problem, research, prototype and test, implement, evaluate, and storytelling. As with design thinking, the phases of the model are not intended to be linear. In particular, the phases of problem definition, research, and prototyping and testing are spaces to be moved in and out of as needed.

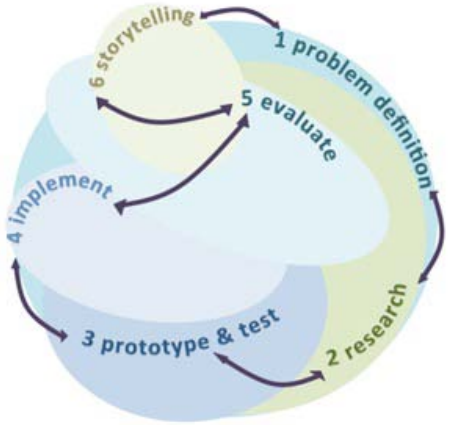

Figure 2
Hybrid EBP and design thinking model

Define the problem

Defining the problem in this model focuses on curiosity and asking "why" questions such as, "Why is it the way it is currently? Why is this

a problem? Why does it matter? What are the business constraints?" The answers may be found through documents, reports, conversations, workshops, or experiences. Through curiosity, developing an understanding of the current context enables the crafting of a question that defines the problem accurately.

Research

Research acknowledges the need to collect and consider primary and secondary research. In this phase, design thinking and EBP converge to bring together information from and about the past through the literature of relevant disciplines as well as personal stories; the present through observation, interviews, workshops and industry trends; and the future through identification of aspirations.

Appraisal is absorbed into this research process. In this model, appraisal is focused on synthesis and sense making, where research is evaluated and insights synthesized. Connections between data are identified and organized into meaningful and valuable findings for action. The question is then reviewed and iterated based on this research as necessary.

Prototype and test

The inclusion of prototyping and hypothesizing allows the use of abductive thinking and creativity to identify possible solutions. It involves generating multiple solutions through structured ideation and then prototyping the solutions most likely to provide significant benefits. These prototypes are then tested directly with customers and stakeholders. The feedback from testing, as well as personal reflections, allows further understanding of the problem and allows the iteration of solutions in a meaningful way. This new information can be combined with the synthesized information from the research phase to inform further hypothesizing and prototyping.

Implement and evaluate

Implementation and evaluation take on rollout and review roles in this model. Due to the significant effort in research, prototyping and testing, and the commitment to collaboration and engagement throughout the process, implementation becomes a routine, minimal risk process as the majority of the barriers and issues have already been addressed. Evaluation is also routine, gathering feedback and reviewing the success of the solution after a determined period of time. This feedback can be used for further iteration or evolution of the solution.

Storytelling

Problem redefinition is replaced by storytelling, a process to close the loop and contribute to the evidence base. When solutions have been implemented and evaluated, it is important to tell the story – informally and formally. This adds to the evidence base that can be drawn from in the research phase of future EBP processes. Design thinking acknowledges that every problem is unique, so the purpose of feeding back into the evidence base is not presenting a solution that can be picked up and implemented elsewhere. It is about documenting the process, the inputs, and the learnings.

A hybrid approach maximizes the strengths of the two methods for designing solutions to wicked problems. While design thinking brings new methods and tools to EBP, the primary benefit of merging the two approaches is the new mindset that design thinking brings to EBP. This mindset focuses on human centredness rather than literature; it redefines what we might consider to be "evidence", and involves collaboration and engagement of customers and stakeholders throughout the whole process to ensure human needs are met. It is also future oriented, looking forward rather than looking back, and enabling a mindset of reframing problems to support solving those with little or no precedence.

Conclusion

There are significant benefits to be gained from adopting a human centred rather than literature focused foundation for EBP. The proposed hybrid approach of integrating EBP with the mindset, tools, and methods of design thinking is one possible model that could move EBP forward.

The model is exploratory, with the recommendation that it be tested. It brings together the most rigorous aspects of EBP and the human centredness of design thinking to create a model that allows for creativity and innovation while also allowing for solutions grounded in evidence. It has the potential to move EBP's applicability beyond tame problems and continuous improvement, toward wicked problem solving and innovation. The authors welcome approaches from organizations that would be willing to test the hybrid model in practice.

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