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Humanising complex projects through design thinking and its effects

ABSTRACT

The last decades of research in project studies show us that humans, rather than technologies, softwares or mathematical models, shape project success. This is simultaneously fascinating and problematic since, while technologies, softwares or mathematical models are relatively easy and straightforward to understand (and govern), humans are far more complex, with extremely intricated links between motivations and emotions. This consideration is particularly true in complex projects where a plethora of very diverse stakeholders not have very different emotions and motivations toward the same project. To address this challenge, this essay proposes using design thinking principles, tools, and techniques to "humanise" complex projects. By bringing together stakeholders with diverse goals and interests and aligning them with a common purpose, design thinking can help to shape, plan, and deliver successful complex projects. While design thinking is commonly discussed in innovation studies, this essay aims to encourage its investigation and discussion in project studies.

Highlights

- Stakeholders are the main agents driving project and project management success
- Particularly in in complex projects, there are conflicting interests and goals, which can lead to challenges with non-market stakeholders in project planning and delivery
- Design Thinking has emerged as a natural extension of Stakeholder Theory, which has long been prominent in Project Studies
- Design Thinking provides a set of concrete, teachable, and scalable tools and processes that can be highly effective in navigating complex stakeholder landscapes and delivering successful projects.

- There is relevant scope for further research in project studies on the role of design thinking in shaping, planning and delivering projects

The human side of complex projects

Over several decades, the management of projects has seen the addition of an array of digital technology tools like BIM (Oraee et al., 2017), blockchain (Lu et al., 2021), data analytics and artificial intelligence (Wijayasekera et al., 2022). Yet, the reasons underlying many overbudgets, and delays are human failures, not ones related to technologies, tools, and techniques (M. A. Babaei et al., 2021; Denicol et al., 2020). Ultimately, project success rests on the ability of a specific set of human beings to work collaboratively (Blomquist et al., 2010; Kalogeropoulos et al., 2020). Complex projects, in particular, require the cooperation of multiple stakeholder groups (Winch, 2004), including non-market stakeholders (Gil & Fu, 2021). For our purposes here, we refer to complex projects using the (Merrow & Nandurdikar, 2018) framework:

- Complex scope refers to technology complexity, integration of system and subsystem etc. This is mostly the domain of classic system engineering tools, techniques and standards.

- Organisational complexity refers to the idea that very different people and organisations are involved in planning and delivering projects. Such people and organisations could come from different countries, have different backgrounds etc. An Italian construction company working with a Chinese owner to procure a large Korean piece of equipment to be installed in an African dam is surely an element of a complex organisation (particularly if hundreds of other organisations and large pieces of equipment are involved). The involvement of stakeholders such as governments that, due to electoral cycles, can radically change their attitude is another classic element of organisational complexity (Juarez Cornelio et al., 2021).

- Complex shaping, i.e. *"the process by which all of the stakeholders in a project are allocated value and via that allocation process become aligned on the scope of a project during front-end development (p. 49)"* (Merrow & Nandurdikar, 2018). Shaping can be relatively easy if the project is constructing a primary school in a nice village in the countryside, but far more complex in the case of a new landfill or a high-speed railway (think about local residents!). In many cases, shaping complexity deals with reaching alignment on the problem we intend to solve and understanding the possibilities and people involved (Locatelli et al., 2021).

Innovation adds an extra layer of complexity, as in the case of constructing a 10th nuclear power plant after nine nearly identical plants have already been built. However, despite the same technological complexity, constructing this 10th plant is less complex than designing and building

the first nuclear power plant, which required extensive research and development (and stakeholders' engagement) that subsequent plants could draw upon. This idea is well captured by (Shenhar et al., 2016) when presenting the case of Boeing's Dreamliner development and applying their "diamond of innovation," i.e. Novelty, Technology, Complexity and Pace (see also (Shenhar & Dvir, 2007)).

As project managers seek alignment during the shaping process in an increasingly global and complex world, it is likely that the specific individuals involved, and their organisations, operate with goals and perspectives that differ from each other (Turner & Zolin, 2012) in ways that are challenging to reconcile, and some of which will appear to be "irrational" through the lens of experts. As (Mitchell, 2021) notes in her review of the challenges facing the Artificial Intelligence field:

> *"Nothing in our knowledge of psychology or neuroscience supports the possibility that "pure rationality" is separable from emotions and cultural biases that shape our cognition and our objectives. Instead, we have learned from research in embodied cognition that human intelligence seems to be a strongly integrated system with closely connected attributes, including emotions, desires, a strong sense of selfhood and autonomy and a common sense understanding of the world." (p.7)*

Thus, project success relies on the ability to work productively together across seemingly "irrational" stakeholder differences and emotions. Changes are occurring in the nature of the task, not just in the nature of the stakeholders involved, further complicating the project management task. (Galbraith, 1982, 2002) has called attention to the fact that, as the environment around them changes, organizations must adapt to new organizational designs. Galbraith argues that two fundamental transitions in how organizations do their work must be supported: the first is an emphasis away from more routine, ongoing work towards work focused on the less routine, more innovative. A second necessary transition is from a focus on product-centricity to a more solution-centric focus.

Against this backdrop, the parallels to the management of complex projects are evident: project work itself is transitioning from emphasizing more routine "ongoing" and "product" (e.g., technically focused) work towards more non-routine "innovating" and more "solution" focused work, with solutions including innovative components that meet the needs of multiple stakeholders. Thus, increasing *complexity* (which Galbraith argues is best managed by breaking

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down into subparts – as in systems theory) is coupled with both increasing *uncertainty* because of the plurality of stakeholders whose motives and perspectives are conflicting and hard to accommodate and predict, plus the demand for increasingly broad and more novel solutions. Achieving success amid this "perfect storm" of conditions –complexity, uncertainty, diversity, and novelty – favours *learning* over pre-established planning. It necessitates a more creative search for novel higher-order solutions, not a breaking down and "control" of non-market stakeholders. These are likely to be emergent in inclusive conversations that find ways to include and accommodate the needs of the many. In a literature rich with discussions of technical and procedural issues, this reality that projects operate amid complex and uncertain conditions characterized by messy, subjective human cognitive and affective processes and interactions remains under-explored and represents a major area of opportunity for project management researchers.

In this essay, we want to add our voices to those advocating for increased attention to a Design Thinking approach as offering the Project Management field a set of *social* technology tools to accompany those that digital technology has made possible, that are optimized to achieve effective management amid the conditions that project managers face today, introduced by the human element, and the correspondent shifting of tasks towards the more innovative and solution-centric (Ben Mahmoud-Jouini et al., 2016; Ben Mahmoud-Jouini & Carlgren, 2022; Hölzle & Rhinow, 2019). Taken together, Design Thinking's toolkit and process methodology can offer a blueprint for success for human-centric project management in a complex, changing, and diverse world.

Design Thinking can be viewed as a natural descendent of Stakeholder Theory, long prominent in the Project Management field (Freeman, 1984, 1994; Littau et al., 2010), as it responds to a call for greater specificity and a "names and faces" particularizing of stakeholder identity (Dunham et al., 2006; Mcvea & Freeman, 2005). (Ben Mahmoud-Jouini et al., 2016) have argued for the potential value of learning between the Design and Project Management fields, as they note the increasingly "wicked" nature of project work (Buchanan, 1992). They highlight three imperatives for successful Project Management: managing exploration, managing stakeholders' involvement, and managing projects with firm-level strategizing, and offer ten propositions for the ability of Design Thing to accomplish these. Similarly, (Ben Mahmoud-Jouini & Carlgren, 2022) compiled a detailed and compelling list of sixteen ways that Design Thinking can contribute to

successful project management at cognitive, processual, and organizational levels. Our aim here is to build on the foundations laid by these scholars to explore the underlying mechanisms through which the social technology aspects of Design Thinking drive the specific project contributions noted by these authors. While Design Thinking cannot replace more traditional PM tools and techniques (WBS, CPM, Risk register etc.), we want to advocate here for the merits of the Design Thinking approach to supplement and enhance traditional tools in unique ways.

What is Design Thinking?

Though often pigeonholed as a tool for generating new products and services, the potential contribution of Design Thinking reaches far beyond this narrow purpose. Design Thinking, popular in business and management circles, is a problem-solving and decision-making approach with a specific set of characteristics aimed at encouraging inclusion and triggering collaborative creativity that has been argued to be especially suitable for dealing with wicked problems (Buchanan, 1992). Though various design thinking approaches may offer differing terminology, all share three main pillars (Dell'Era et al., 2020). The first is attention to human subjectivity and a corresponding focus on empathy rather than the objective and detached stance of technical approaches (Brown & Barry, 2009). The second is an initial emphasis on possibility-driven solutions rather than constraint-oriented ones, as in traditional PM approaches (Rand, 2000). Third is a preference for experimentation over analysis based on historical data (Magistretti et al., 2021). The essence of Design Thinking's methodology is the activities of need-finding, ideation, and iterative prototyping. Figure 1 provides a summary of the process, tools and steps that are included in the Design Thinking process based on the work of (Liedtka & Ogilivie, 2011). It suggests that practitioners of Design Thinking ask four questions: *What is*? *What if*? *What wows*? and *What works*? and employ some of the arrays of tools available to answer them.
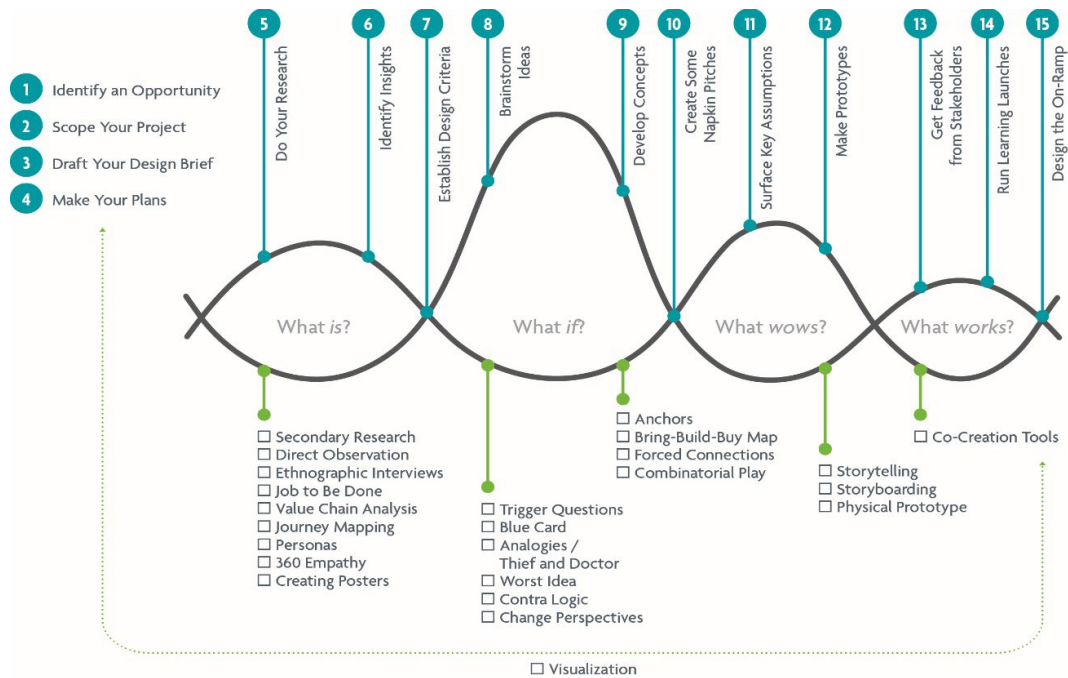
Figure 1 The Design Thinking Process, Tools and Steps (Liedtka & Ogilivie, 2011)

The process begins with a focus on current reality and what stakeholders are experiencing today by asking, "*What is*?" and employing a suite of ethnographic tools that include user journey mapping, job-to-be-done, and ethnographic interviewing and observation, to answer that question. Need-finding is the key activity, and the ultimate goal in this stage is to develop a shared focus on the needs of those being designed to reach alignment across participants in the decision process about the definition of the problem and the criteria with which to evaluate success. This consensus lays the groundwork for productive ideation and testing.

The process next turns to idea generation based on the question, "*What if*?" In this stage, constraints are put temporarily aside, and the emphasis is on identifying possibilities triggered by the question, *what if anything were possible*? Such possibility-driven thinking encourages the emergence of creative higher-order solutions, born out of a dialogue across diverse stakeholder groups that leverages the different perspectives and expertise of those involved - but within a shared frame concerning problem definition and success criteria. A portfolio containing multiple potential solutions is generated using the knowledge and empathy developed during the previous *What is*? stage as inspiration and utilizing a variety of approaches for concept development that move beyond conventional brainstorming, one that centres solutions around the broader needs of the different stakeholders involved, both emotional and technical.

With a portfolio of possibilities in hand, experimentation begins, involving rapid prototyping and testing to narrow down to a smaller set of possibilities to move forward based on feedback from key stakeholders. The first stage of experimentation – determining "*What wows*?" – prepares for testing by treating any given idea as a hypothesis and surfacing the critical assumptions about why the conditions exist to make this true: desirability (the project creates value for stakeholders), feasibility (it can be executed) and viability (it can be sustained over the long term, i.e., the discussion around project success). Prior to this stage, the need-finding and ideation activities have been primarily concerned with desirability alone. In postponing consideration of feasibility and viability until the testing stage, the goal is to build enthusiasm and energy for creatively surmounting constraints rather than accepting them. This endeavour will not always succeed, of course. Many desirable projects cannot be made feasible or viable long-term, necessitating iteration, pivoting, or abandoning some desirable solutions.

An important aspect of this stage is the creation of prototypes that translate solutions from the abstract to the concrete. This aligns project teams around the specifics of particular elements of the solution and allows them to obtain more accurate feedback from stakeholders during the next phase. In contrast to the higher fidelity prototypes often generated by engineers, these prototypes emphasise simplicity and focus on conveying the user experience rather than the mechanics of the solution. Initially, they may be simple storyboards and posters. Their purpose is to engage and *"provoke"* (in design lingo) stakeholders, particularly non-market stakeholders such as local communities (Babaei et al., 2023; Maddaloni & Sabini, 2022; Maddaloni & Davis, 2017), in learning-oriented conversations to test assumptions, not to evaluate final solutions. It is crucial to consider the viewpoints of all non-market stakeholders who have the potential to impact or lay claim to the value it creates (Paravano et al., 2023). Addressing these stakeholder demands in the early stages of the project can lead to a more streamlined and secure environment for project delivery (ICE, 2020).

The final question, "*What works*?" moves the process into the real world. Simple field experiments, *"learning launches"*, are designed and executed. As the project team's knowledge base grows, the portfolio is reduced, and investment is made in higher fidelity prototypes and more rigorous experiments until a final concept is selected and shaped into a form ready for project implementation.

So, what might the application of Design Thinking look like in managing a complex project? For example, let's examine just one of the projects involved in bringing high-speed rail to the UK – the construction of a large viaduct crossing a massive lake in an environmental area with many recreational activities. The original Design, constructed without input from the community, was constructed to be a "signature" structure, massive and imposing in scale, requiring removing a local boating club and multiple recreational trails. It faced strong community opposition and was immediately rejected by the local authority, whose approval was needed to move the project forward. New project team leadership elected to try a Design Thinking approach based on inviting a broader set of non-market stakeholders into the conversation and understanding their needs and fears *before* attempting a redesign. Applying the Figure 1 framework to this project, the team first reached out to the community, using mail drops, local radio, and other media, to make a public commitment to the community, communicating the message that the new Design would result from a dialogue *with* the community, not be sent as a broadcast *to* them. The team then took time to meet with community members, individually and in groups, to learn about their needs and to have person-to-person conversations that surfaced existing hostilities and fears and then worked to build trust. After gaining confidence that they understood the current state - *What is?*- the team invited members to a series of workshops to generate multiple possibilities that re-envisioned what a viaduct that better met the community's needs might look like. As expected, tensions surfaced between the engineers' vision and those of different stakeholders. Designers were forced to set aside the most obvious solutions to think more creatively about accomplishing the project's stated purpose, but in new ways that better addressed the community's concerns around issues like how to do noise barriers differently – asking, *What if?* The team came back with new options, using a charrette format, to figure out *What wows?* The charrette is a process that has been used in the fields of architecture and urban planning for several decades. It involves a highly collaborative approach that brings together all stakeholders involved in a given challenge into a room to generate a variety of innovative solutions. The process emphasizes rapid iterations, feedback, and moving between small work groups and the entire collective to develop ideas (Salzman & Azer, 2017). Using prototypes in the form of computer renderings that captured and reflected back the things they had heard from the community. Finally, in *What Works?* "we handed the community red pens," as a team lead described it and worked through their feedback. There was constant iteration throughout the process as the project team listened, demonstrated what they

heard in new versions of the viaduct, and pushed each other to think creatively about meeting the community and the project's needs. "It took months and months," as the team leader explained, "but in the end, it was more efficient than the "our way or the highway" approach, which would never have worked." The final Design for the viaduct – much smaller in profile - was approved and moved into construction.

The virtuous cycle of experiences

As detailed before, Design Thinking disagrees with the idea that a "project design" comes from a restricted group of internal stakeholders, is fully scoped at the outset by them, and then is "imposed" on non-market stakeholders. Instead, non-market stakeholders (or, in Design Thinking terms, "participants") are involved through a virtuous cycle of experiences. Figure 2 suggests the virtuous cycle of experiences that results for all participants when the progression through the four questions is successful.
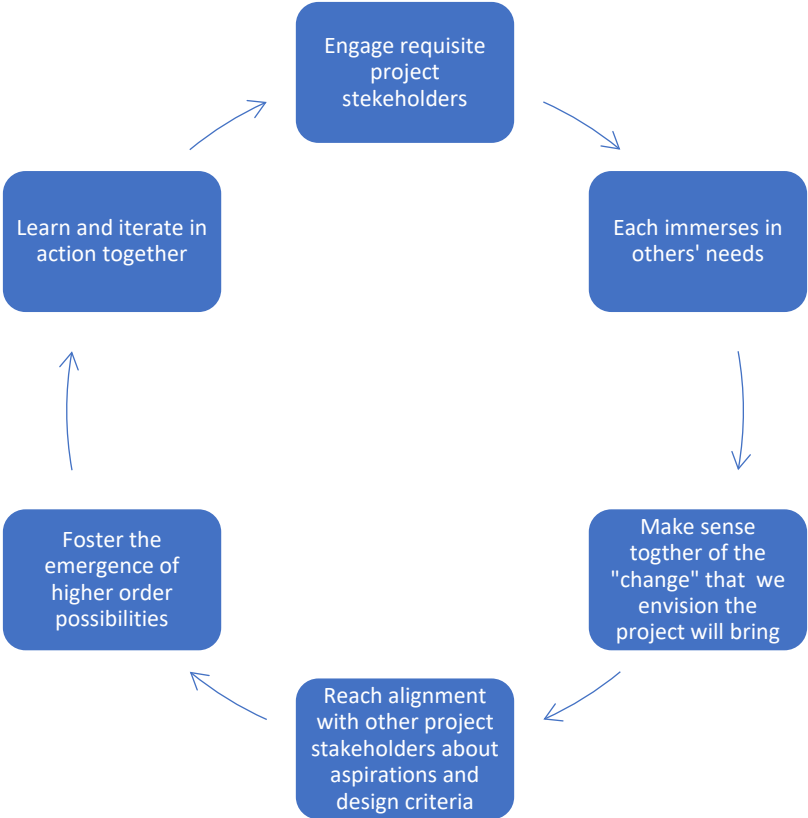
Figure 2 Project stakeholders' virtuous cycle of experiences

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The *engagement* of a diverse set of requisite stakeholders sets the stage; the composition of participants will determine the boundaries of the group's expertise and the knowledge available to them, hence, the solution. As need finding commences, each is asked to *immerse* themselves in the different perspectives and realities others bring to the table, developing a broader perspective and greater empathy for each other. As a result, individual *sensemaking* shifts from habitual parochial ways of looking at the problem to instead make possible broader shared meaning about current reality (Ben Mahmoud-Jouini & Carlgren, 2022; Kolko, 2010). Sensemaking is essential in complex projects, particularly when an element of complexity is the different cultures involved in the projects (Fellows & Liu, 2016). Now, groups can reach *alignment*, jointly reframing the problem as needed to agree on the specific problem to be solved and the criteria that a good solution will need to meet. As they move into ideation, the group can tap into the diversity of experiences each brings so that new and higher-order possibilities can *emerge* jointly (Lee, 2008). These emergent options are then prototyped and tested with stakeholders in small experiments, allowing *learning in action* to occur for the group as a whole (Lee & More, 2015). Thus, Design Thinking creates a virtuous cycle with the potential to assist project managers operating in complex social systems to achieve more effective collaboration.

Design Thinking is not a panacea for all the troubles affecting projects and the management of projects. Project managers employing Design Thinking likely face a set of challenges. (Carlgren & BenMahmoud-Jouini, 2022) note the potential cultural conflicts that are likely to arise as Design Thinking is implemented in traditional organizational cultures that lack strong values supporting inclusivity, subjectivity, flexibility and recognition of emotions at work. (Hölzle & Rhinow, 2019), examining the project management interface specifically, observing difficulty in setting milestones when learning is the goal, knowing when to move on to the next stage, and the intrusion of strategic objectives from outside the project. All point, they argue, to the critical role of the project manager in negotiating the interface between project and organisation that these issues bring to the fore. Design Thinking offers these project managers a potentially powerful new tool for accelerating collaborative conversation to both improve strategizing (Liedtka & Kaplan, 2019) and reduce cognitive biases (Liedtka, 2015), offering an increasingly valuable social technology to complement their existing tools and processes.

How does Design Thinking Deliver Value to Project Management?

Design Thinking is not the only approach for planning and delivering projects. While comparing Design Thinking with the various approaches is outside the scope of this essay, it is worth comparing with at least one: System Thinking (Senge et al., 2007; Senge, 2010). Design Thinking and System thinking share some commonalities, notably the system approach, and can both contribute to planning and delivering complex projects (Locatelli et al., 2014), but there are also differences. For instance, a key point of System Thinking is decomposing "the project/problem" into sub-elements to study each element, its role, and the link with the other elements, tools like the "Vee model" are exactly intended for this scope. Design Thinking does not attempt this, while it looks at how the "overall design" plays a role in its context. System Thinking mostly focuses on the internal stakeholders: engineers, clients, sponsors etc. Design Thinking is focused on engaging non-market stakeholders, particularly users and local communities. Design Thinking is therefore a tool for project owner since *"Owners must clearly define the user outcome, so that engineers and technology developers can deliver for that use The purpose of infrastructure projects is to provide a service that meets the needs of their owners and users – not just to deliver a physical structure (Page 13)"* (ICE, 2020)

Design Thinking accomplishes the multiple specific contributions already highlighted by researchers (Ben Mahmoud-Jouini & Carlgren, 2022) by operating at a higher kind of "meta" level that shape both the individuals who practice it and the conversations they lead. These strategic conversation-shaping benefits include recognizing the criticality of both subjectivity and objectivity, an aspiration and toolkit for treating difference as a positive force, encouraging managers to slow down and explore the problem rather than moving immediately to solutions, and the ability to create conditions for the emergence of higher-order solutions:

1. **Recognising the criticality of subjectivity and objectivity and the role that emotions play – both those of the designer and those they are designing for**. In the early stages of projects, using a Design Thinking methodology, developing empathy and understanding the project context as seen from multiple perspectives prior to idea generation is the goal (Clarke, 2010). In the latter part of the project life cycle, detachment and the ability to work with disconfirming data become key as ideas move into experimentation. As (Babaei et al., 2021) note in their review of the remedies needed to address the challenges facing the front end of complex

projects, cooperation across policymakers, project managers and members of society is critical. Design Thinking's front-end tools, like stakeholder journey mapping and Job-To-Be-Done, focus on stakeholders' diverse emotional and functional needs and experiences. At the back end, Design Thinking encourages a scientific detachment that benefits experimentation.

2. **Framing difference as a positive force.** Decades of research demonstrate that diverse project teams offer the greatest promise for the creation of higher-order solutions (Liedtka & Ogilivie, 2011; Seidel & Fixson, 2013; Wilkerson & Trellevik, 2021), yet the heightened conflict that difference spawns can prevent the realisation of this promise and diverse teams frequently underperform (Sawyer, 2012). Design Thinking explicitly leverages differing perspectives among project stakeholders rather than suppressing or attempting to control them (Greenwood et al., 2019). Research in complex adaptive systems (Colander & Kupers, 2014) identifies two aspects critical to successful adaptation under these conditions: *requisite variety* and the management of the phenomena *of emergence*. Requisite variety asserts that the level of diversity in the solutions considered should equal the level of diversity in the environment of the problem. But requisite diversity is not accomplished by just putting random stakeholders in the room; it requires thinking beyond the usual stakeholder management perspectives to ask what combination of competencies and experiences will be necessary for a successful repertoire (Maqbool et al., 2017). A group with the right kind of diverse repertoire optimises the ability to produce higher-order solutions – seeing together what none could see alone - by working across silos. Accordingly, who you put in the room really matters, and Design Thinking tools like stakeholder mapping can help managers figure out who needs to be there – and for what part of the process (Oschinsky et al., 2022).

    Yet merely putting people in the room is insufficient – project leaders (including clients and sponsors!) need tools to manage the ensuing conversation to create the conditions for emergence (Cross, 2011). Building trust – also encouraged by System Thinking's social technology - is essential to achieving genuine dialogue. Achieving this involves carefully structuring a safe space for a robust conversation, moving in and out of small groups where possible, and enforcing conversational norms like turn-taking and the idea that everyone participates (Brown & Barry, 2009). It includes ensuring that all voices are heard, with special attention to those least comfortable speaking and often forgotten (Locatelli et al., 2022a). This is particularly important not just for ethical reasons but also for business reasons. For instance,

in complex infrastructure projects, it is essential to have a diverse workforce with a broad range of backgrounds and professional disciplines to identify the various risks that can arise throughout the project. Leaders must actively promote diversity at all levels of the organization and ensure that all voices, including those who are less outspoken but nonetheless critical, are heard and valued (ICE, 2020). By offering a structured methodology that emphasises dialogue and the surfacing of assumptions (Johansson-sköldberg et al., 2013) and using visualisation tools like storytelling and prototyping, Design Thinking engages project stakeholders and makes it possible for them to see and examine the reasoning behind both their own and others' perspectives, to listen more openly and to build on each other's ideas, in ways that generate both improved solutions and a sense of ownership (Seidel & O'Mahony, 2014; Stigliani & Ravasi, 2012).

3. **Slowing down the process by forcing managers to treat their definition of the problem itself as a hypothesis rather than as a given - and spend time examining it.** Project managers and decision-makers in projects (e.g., the people in the integrated project team) often feel pressured to seize and implement the most obvious early solution and devote their energy to "selling" to sceptics not involved in the process. Instead, Design Thinking insists that groups slow down and immerse themselves in the current reality of the problem/opportunity as seen from the different key stakeholders' perspectives. This is slowing down, and focusing on those being designed for allows a diverse group to build trust, converge first on a problem definition and then on the design criteria that will signal a successful solution. This convergence pays dividends later in the process when choices must be made.

4. **Fostering the conditions for the emergence of higher-order solutions by starting with consensus on project definitions and needs upfront, then focusing on possibilities.** Great Design, Richard Buchanan argues, occurs at the intersection of possibilities, constraints, and uncertainties (Buchanan, 1992). For higher-order solutions to emerge, working to keep scepticism at bay until *after* possibilities are surfaced and developed is essential. Only possibilities engage emotions and excite people (particularly non-market stakeholders) enough to overcome the hard work of crossing the boundaries that divide them. This energy and creativity generated by possibility-driven discussions powers breakthrough thinking. (Magistretti et al., 2022) have shown the value of a Design Thinking approach even in long-term speculative projects, where the creation of alternative future scenarios aids decision-

makers' ability to analyse trends and envision future possibilities. Following idea generation, Design Thinking's back end, with its careful attention to assumption surfacing, prototyping, and testing, offers analytically focussed and sceptical minds the opportunity for critical evaluation – but producing something *worth* testing requires protecting the upfront investment by asking "what if anything were possible?"

The reason, in part, that Design Thinking can shift conversations in the ways described above is because it first shifts the mindsets and behaviours of the individuals who practice it (Liedtka et al., 2021). Immersion in other stakeholders' needs shifts participants' mindsets and unlocks emotion and new possibilities. It generates deep insights that build empathy, enthusiasm, and emotional commitment. Alignment about what matters emerges across diverse stakeholders, creating a willingness to co-create new ideas. Exploration of differing assumptions behind those ideas builds self-awareness that reduces cognitive bias and improves testing. Visualization tools teach people to bring ideas to life, making them feel real, to both teams and users to solicit better feedback. Design criteria make evaluation clear. Confidence in the ability to manage risk builds change readiness.

These changes are especially evident in their confidence in and ability to manage risk. Fear of failure is a prominent impediment to project management challenges like escalation of commitment (Liu et al., 2019; Ross & Staw, 1993). Over the decades, project scholars and practitioners have developed approaches to deal with risks from the front end. Such approaches include workshops where stakeholders provide their perspectives on project risk through creative tools like causal mapping. (Ackermann et al., 2014) highlight the value of structured conversations across different perspectives for risk assessment. Involving a diverse range of stakeholders in an efficient, systematic approach to risk assessment improved outcomes in their research. Achieving these results, they argue, necessitates inclusion of the appropriate diversity of voices, active participation on the part of participants, and use of visualizations like maps to allow them to see interactions that result in cross-disciplinary learning. Design Thinking pushes beyond risk assessment to its management. Front-end human-centred tools ensure that solutions created are seen as valuable by relevant stakeholders rather than just those running the project. Design Thinking's back-end emphasis on experimental methodologies targets well-known cognitive biases that erode the quality of decisions (Liedtka, 2015), actively managing the risk of

overinvestment in ideas that look good in theory but not in practice. Its belief in moving multiple ideas into experimentation lessens ego investment in any given one and allows multiple stakeholders to see their impact.

Finally – and perhaps most important, Design Thinking offers concrete, teachable, and scalable tools and processes that can be ideal in planning and delivering complex projects- tools to engage non-market stakeholders in projects such as ethnographic observation and interviewing, Job-to-be-done analysis, journey mapping, persona development and guidance on the Design and execution of experiments. It also offers a concrete process to employ them (Lewrick et al., 2020). In doing so, it adds structure to project activities that often seem abstract and uncomfortably ambiguous, increasing managers' personal creative confidence and willingness to take risks (Edmondson, 1999; Jaskyte & Liedtka, 2022).

Moving forward

In the three most relevant project studies journals (IJPM, PMJ, IJMPB), only two papers focused on Design Thinking in the context of projects have been published (Ben Mahmoud-Jouini et al., 2016; Hölzle & Rhinow, 2019). Another (Walker et al., 2022) shows that design thinking can shape collaborative behaviours and project governance. The central idea of this essay is that Design Thinking has much more to offer to projects, project scholars and project practitioners both from a phenomenological perspective (i.e., the planning and delivering of projects, particularly complex projects) and a field of study perspective (i.e., the studying of projects by project scholars). Embracing Design Thinking is a great example of the need for novelty in project studies research discussed in the Manifesto for project management research (Locatelli et al., 2023). All of the above suggests multiple questions through which scholars might explore how this new methodology impacts the management of projects. Therefore, we conclude this essay by pointing out potential areas for future research.

- In planning complex projects, *Who* should be invited into *what specific parts* of the design conversation? How should these conversations be managed?
- We know that stakeholders hurry to finish the Design as soon as possible and rush to implementation. How can we convince stakeholders to pay greater attention to *problem formulation* and reframing rather than only problem-solving?

- Projects are the vehicle of change to address grand challenges (e.g., decarbonisation). In project studies, we began to speak about the sustainability "of the project" and "by the project" (Gareis et al., 2013; Huemann & Silvius, 2017). How might Design Thinking change the nature of projects we plan and deliver?
- Projects have elements of social unsuitability or "Dark side" (Locatelli et al., 2022b). For instance, projects might involve corruption, modern slavery, money laundering, sexism etc. To what extent can design thinking be used to mitigate these phenomena?

Thinking back to the prominent role that scholars have played in explicating, exploring the impact of, and refining tools like Total Quality Management and Lean that have revolutionized managers' ability to operationalize quality, we see an equally significant potential to contribute to the understanding of Design Thinking and the mechanisms through which it can be applied to project management in our increasingly "wicked" world.

Acknowledgements

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