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CASE STUDY

The Challenge

Design and innovation activities are increasingly characterised by pressure to make progress quickly, often leading teams to prioritise action and delivery over structured learning. In practice, this results in a “doing” mindset, where prototyping activities are undertaken without sufficient clarity on what knowledge is missing, which uncertainties matter most, or what questions a given activity is intended to answer. As a consequence, teams may expend significant effort generating outputs that do little to reduce risk or inform key decisions. In short, trying to go quickly without a clear direction results in delays and over runs.

This challenge is compounded by the widespread availability of physical, digital and hybrid design tools. While these tools afford different types of learning and insight, there is limited guidance to help teams select methods based on the knowledge they need to generate, rather than on habit, personal preference or on technological availability. The absence of a shared language for articulating knowledge gaps makes it difficult for multidisciplinary teams—particularly designers, technologists and founders—to align on priorities and intent, limiting effective collaboration.

Within the Digital Catapult context, this problem was especially pronounced due to the diversity of project types, technologies and company maturities involved. There was a clear need to enable a mindset shift from producing artefacts to deliberately learning through prototyping, supported by mechanisms to explicitly identify, communicate and prioritise critical knowledge gaps. Addressing this challenge was essential to improving decision making, reducing wasted effort, and supporting more resilient and effective product development processes.

Innovation

The project delivered innovation in how design and prototyping activities are framed, planned and undertaken in industrial settings, shifting practice from a focus on “doing” towards deliberate learning and informed decision making. Working in close collaboration with Digital Catapult, the project co-developed and implemented The Prototyping Playbook, a practical methodology supported by a book, workshop materials and structured activity templates.

The Playbook provides an eight-stage process that helps teams explicitly identify critical knowledge gaps, clarify what they need to learn at different stages of development, and select prototyping approaches that are appropriate for resolving those uncertainties. Rather than prescribing specific tools or technologies, the methodology prioritises learning objectives and decision needs, enabling teams to align activity with purpose.

The innovation was underpinned by translation of design research into a lightweight, accessible process that could be integrated into real-world programmes and applied across a wide range of technologies, project maturities and organisational contexts. The Playbook was iteratively refined through piloting; delivery within established Catapult programmes.

Result

The project generated practical and empirical insights into how teams plan, sequence and use prototyping activities in real world innovation contexts. Through structured delivery and application of The Prototyping Playbook, it was observed that teams were able to more explicitly articulate what they needed to learn at different stages of development, rather than defaulting to business-as-usual led activity. This highlighted previously implicit or unexamined assumptions within projects and brought critical uncertainties to the foreground.

The methodology was applied across multiple Digital Catapult programmes and piloted with a diverse set of organisations spanning different technologies, sectors and levels of maturity. In total, the Playbook was delivered to over 20 companies, engaging approximately 70 practitioners including designers, technologists and founders. Feedback collected during

and after delivery indicated that participants perceived the structured activities as highly useful for clarifying prototyping method selection, prioritising effort, and supporting internal alignment.

The project also demonstrated that a shared, structured approach to prototyping could function effectively as a boundary object between disciplines, enabling more productive conversations about risk, learning and decision making. The Playbook assets were iteratively refined based on pilot use and practitioner feedback and successfully transferred to the Digital Catapult Design team, who are now trained to deploy the methodology independently within ongoing and future programmes.

Impact

This project has impacted how design and innovation activities are structured across sectors that rely on multidisciplinary, technology-enabled development. By prioritising learning and uncertainty reduction, the work challenges prevailing norms that can result in prioritisation of doing over learning. In doing so, it provides a practical pathway for organisations to adopt more knowledge-led and resilient innovation processes. At a sector level, the methodology supports organisations in making better-informed decisions about how and when to invest effort, resources and technology during early-stage development. This is particularly relevant in contexts characterised by high uncertainty, complex socio-technical systems and rapid digital transformation. By helping teams explicitly identify what they need to learn and align activity accordingly, the approach can reduce wasted effort, mitigate downstream risk, and improve the quality of design decisions.

The work also addresses a systemic challenge in innovation practice: the difficulty of aligning designers, technologists and decision-makers around shared priorities. By providing a common structure and language for discussing uncertainty and learning, the methodology enables more effective cross disciplinary collaboration, which is critical for addressing challenges in areas such as digital infrastructure, advanced manufacturing, and cyber-physical systems.

Through continued dissemination via Catapult programmes, industry engagement and higher education, the outputs of this project have the



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potential to shape how future innovation programmes are designed and delivered. More broadly, the work demonstrates how research-informed design methods can be translated into scalable practice, strengthening the connection between academic insight and industrial impact.

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“Working with Mark has been invaluable in bringing rigour and clarity to how we use prototyping methods within the catapult. We’ve been able to expand on, make relevant to, and validate methodologies with real customers and our internal teams during this period. Overall, it’s academically grounded our understanding and use of user research and prototyping methods whilst simultaneously making it relevant to industry.” - Elmer Zinkhann

“I thoroughly enjoyed being part of the Researcher in Residence scheme and would strongly recommend it. The Digital Catapult were a very supportive and engaged partner, helping to convert my research into forms that were genuinely useful in industrial settings. Seeing the project have real impact by supporting clearer decision making and improved product development processes was extremely rewarding. The experience was also a powerful reminder of the value academic research can bring when it is applied to the realities of industrial practice.”