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How Industrial Design Supports a Customer-Centric Innovation Approach in a Technology-Centric Business Environment

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This article provides a case study of a UK university working in close partnership with Parker Hannifin Corporation (PH), a Fortune 500 U.S. manufacturing company, to develop new innovation practices. We discuss how industrial design has been introduced as an in-house function to one of the company's divisional headquarters, in Gateshead, UK, through a collaborative research partnership over three years. Case material from four projects is presented, which illustrates a progressive, negotiated adoption by the company of the capabilities of industrial design as an essential component of a customer-centric innovation approach. It has involved developing the organization's own confidence about the value and fit of industrial design through a series of projects and regular reflection on what is working well and not so well and what is raising concerns. The approach described provides an alternative to attempting to develop and implement a preformulated grand plan for design.

Key words: customer-centric innovation, industrial design, large organizations, design-led innovation, manufacturing

Introduction

Over the last decade, there has been steady growth in the number of organizations establishing in-house design capacity instead of relying on outsourcing through agencies. Many mature businesses have found that their capacity to innovate has been stifled by an overreliance on technical innovation and are looking to design to reshape their approach. This follows the celebrated

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successes of companies such as Apple and the arguments for design articulated by IDEO's Tim Brown (Brown, 2009), Roger Martin (The Design of Business, 2009), and others. This new expectation presents a challenge for design, particularly in large organizations: How can innovation processes be recast to define and situate in-house design capability such that it will not be too constrained to be effective? How should the design function relate to existing disciplines, directorates, departments, and already established business processes?

This article provides a case study of a UK university working in close partnership with Parker Hannifin Corporation, a Fortune 500 U.S. manufacturing company, to develop new innovation practices. It discusses how industrial design has become an essential driver of the organization's customer-centric innovation approach and illustrates its growing influence within the corporation.

Forming the partnership for the research

The collaboration between Northumbria University, UK, and PH developed out of a dialogue between one of PH's divisional marketing managers based in the United Kingdom and the university's School of Design. He had observed that while PH Gateshead saw itself as innovative, it was not meeting all of the corporation's targets with regard to the proportion of new-to-the-world products in its portfolio. Although there were a substantial

number (50+) of projects in development, almost all were improvements, modifications, and extensions to existing product families. Through the divisional marketing manager, PH had begun to explore how to build a team to incorporate strategic market development and product management and perhaps design to address this. The School of Design team felt that industrial design could be a key actor in that process, and, as a result, the partnership was formed to explore the value of taking a customer-centric view of innovation in this technology-centric business.

The company itself recognized that the impetus for many of the original product lines had been provided by emerging technologies of the time. Now, however, it was increasingly difficult to command a premium margin when competitor-product performance was becoming if not comparable then good enough in several sections of the market. If there was less opportunity to innovate through a technology push approach, PH would need to develop its capacity to better understand and interpret its customers' needs as a source of innovation. To do this, a collaborative research plan was formed between the business and Northumbria University, to promote knowledge exchange in both strategic marketing and industrial design. A combined academic team from the School of Design and the Business School would investigate ways to shape innovation practices at PH by improving the quality of engagement the company had with its customers

during the early phase of product development. The collaborative research plan anticipated a series of pilot projects that could be used to define and test the new approaches, leading to an understanding of their efficacy and value in this context. The approach was titled *customer-centric innovation*, as it would focus on developing an understanding of customer needs as a source of insight for innovation.

Customer-centric innovation

The purpose of the collaboration was to develop capacity for the sort of innovation that goes beyond incremental development and is capable of exploring and defining what customers would really value—the sort of innovation that is strategic rather than tactical. The term *customer-centric innovation* was used in the planning documents to summarize the project goal because it served as a useful, descriptive term, not because we were following any one academic definition of this strategic type of innovation. There are many different terms in the design literature that capture the approach we were advocating, Verganti's *design-driven innovation* being one of the best known and which is variously described in the academic business literature as “discontinuous” (Veryzer, 2005), “bold” (Cooper 2011), or “value” innovation (Chan Kim and Mauborgne, 2005). Here, we are using the term *customer-centric innovation* because it builds from an understanding of customers' needs and uses that

understanding to drive innovation. As an important distinction, it should be noted that it is not a process of simply providing what customers request (corroborated by Selden and MacMillan, 2006, and by Michelli, 2014).

... this approach makes design strongly customer-centred, but not necessarily customer-driven. The difference is that the former is about understanding customer needs and wants they may not even realise they have themselves, while the latter is simply a matter of responding to existing demand. Being customer-centred allows companies to lead and innovate, not just be buffeted by the market.

(Michelli, 2014, p. 15)

In practice, we view customer-centric innovation as a mode of practice that approaches Verganti's design-driven innovation (Verganti, 2009) but avoids the semantic risk of suggesting that designers are in charge. We appreciated that a theoretical or overt design-led approach might create resistance. On that basis, the *customer-centric innovation* term was preferred for this multidisciplinary (marketing, design, engineering) setting.

Research approach

This article considers the degree of acceptance and adoption of industrial design across four case-study projects, identifying activity that effected a customer-centric approach and has therefore contributed to the company's capacity for breakthrough (i.e., beyond incremental) innovation.

In the case described, the work of the academic team was situated in a live, commercial context throughout the study. The case-study approach (Yin, 2013) was adopted to examine contemporary phenomena in a real-life setting. The academic team followed an inductive, action-based research approach to understanding the organizational culture (Hatch and Schultz, 2008) and the key responsibilities around innovation and new product development. It involved situating an industrial designer employed by the university in the business, full time. This arrangement enabled us to report outcomes in relation to what proved to be possible/negotiable in the context of real business demands during a three-year collaboration. Findings are discussed in the context of the compromise and pragmatism necessary to effect organizational change.

We, the authors of this paper, include members of the academic team, the industrial designer who was the focus of the collaborative knowledge exchange, and key staff in the company from the marketing and engineering departments. We therefore use our own firsthand experiences as part of the study. We met three times a year specifically to discuss and reflect on progress toward embedding the customer-centric innovation approach and to reach agreement on the next necessary phase of activity. This has enabled the case material presented to be cross-referenced to the records of those meetings. Further project evidence is drawn from the personal

reflective-practice accounts maintained by the industrial designer through the period of the study as part of his own postgraduate research.

Business context: product- and technology-centric manufacturing

When the partnership between the university and PH was formed, PH presented as a technology-centric business environment. It has a long history of technological innovation, has developed some of the key patented technologies in its sector, and has promoted technically oriented staff into several key senior management roles.

The business's main product line consists of industrial filters, which are considered best in class in terms of performance, needing significantly less energy than competitor products to push gases through the filter elements, while still effectively removing the targeted impurities. PH has excellent analytical knowledge in its research and development (R&D) and engineering teams to both continuously improve performance characteristics and map and evaluate emerging technologies. On this basis, we characterize the company as predominantly technology centric and already highly capable in technology-driven innovation.

Marketing

PH already had some marketing provision in the form of business development managers (BDMs) and a divisional marketing manager (DMM), but only the DMM was

actively engaged in strategic market research and market development at the beginning of the partnership. The BDM roles were focused principally on sales management.

Industrial design

PH already used design but on a peripatetic basis where projects were judged to need some design input. This tended to be triggered by concerns about user-interface elements emerging at the prototyping stage rather than being driven by the opportunity to understand customers. Since the acquisition of the company by the Parker Group in 2006, the design team had typically been commissioned for product design consultancy once the product's overall form, function, and configuration had been determined. The design input to date had therefore been limited to product aesthetics.

When Parker took control in 2006, corporate brand guidelines were introduced, which included a product language with illustrated examples and key corporate colors defined. However, in 2013 at the start of the current collaboration, this had not yet been implemented on any products at PH Gateshead.

PH's existing product range and innovation drivers

The majority of the company's product portfolio was conceived from a technology-driven perspective where opportunities for innovation emerged principally through excellence in technology development and R&D. This approach had been highly

successful, positioning the organization (then trading as "domnick hunter" [dh]) as a market-leading, premium brand in filtration. By introducing original equipment from this market-leading position, PH had established a high-volume after-market business, selling replacement filter elements to its installed base. However, over the last few years, some of the key patents had reached the end of their term and the industrial filtration sector had become commoditized as competitors launched generic refill elements.

Looking at the pattern of innovation through this period of relative strength in the market, the emphasis on tailored product versions to suit particular customer requests had grown, but the focus on strategic (or bold) innovation had waned. This follows the general trend across the sector of mature manufacturing from 2000 to 2010, which saw incremental development work almost double and new-to-the-world product innovation reduced almost by half compared to the previous decade (Cooper, 2011). Some inquiries through the PH sales team implied new market areas and so were managed within the firm from a more multi-functional perspective. They were typically led by the BDMs, using, for example, some competitor analysis and voice of the customer (Griffin and Hauser, 1993) before briefing the technical team on those findings. This product-development mix illustrates that the company was already able to bring new technology elements to market to improve performance (technology driven) and was also able to respond

to opportunities identified by customers (customer driven). What was not in place was a customer-centric approach for proactive exploration of customers' needs, that is, not simply listening to customers but working closely with them through a proactive approach to problem definition and understanding both their explicit and their as yet unexpressed needs. This lack of proactive market development and innovation strategy had left the organization poorly prepared for new competition and market commoditization.

At the beginning of the collaborative project with the university, when the PH Gateshead site assessed its development portfolio, it found that although the overall volume of product development was high, it was not meeting PH's metrics for the proportion of new-to-the-world products in progress.

Key projects delivered through the collaborative partnership

Through almost three years of collaboration, the partnership between PH (Gateshead) and Northumbria University shared research, guidance, expertise, and staff resources to establish and embed a customer-centric innovation approach in the company through both strategic marketing and industrial design. In this part of the case study, we describe four projects that were significant from the industrial design perspective. Together they illustrate a progressive, negotiated adoption by the company of the capabilities of industrial design as an essential

component of a customer-centric innovation approach.

Project 1

In 2013, just prior to recruiting the in-house industrial designer to the main collaboration, PH worked with Northumbria University School of Design to address a strategic product-branding question. A detailed, European survey of brand equity in the gas treatment category found that awareness of the "Parker Hannifin" (PH) brand was stronger than the "Parker - domnick hunter" (Pdh) subbrand (79 percent of customers were aware of the PH brand as compared to 56 percent for Pdh). A key product in this range, NitroSource, was scheduled for relaunch with significantly improved technical performance. It was decided that it should be the first product from the Gateshead site to adopt the PH global product language and color palette outlined in PH brand guidelines (see Figure 1). The design academics at Northumbria University worked closely with the company to realize this project. Industrial design focused on interpreting the brand guidelines and redefining the user-facing components—that is, protective covers, enclosures, doors, connection point graphics, etc.—to embody them. The core pressure vessels, valves, and manifolds (internal functional performance components) retained the size and general arrangement of the previous models sold as Pdh, although performance testing demonstrated that a step-change had been achieved in the gas treatment performance.



Figure 1. NitroSource-Maxigas displayed in the company foyer in its full Parker Hannifin product language and livery—the first product produced at the Gateshead site to adopt the group's brand guidelines. [Color figure can be viewed at wileyonlinelibrary.com]

The revised product had a soft launch to internal teams within the PH group and quickly became influential. Supporting product launch materials were produced through an external communication agency using digital animation, giving the product high visibility online within the PH group. The first-off prototype unit and its supporting video material attracted positive feedback in meetings of the general managers representing manufacturing sites around the world. The product was relaunched in 2014, and the combination of improved performance specification with the full Parker look and feel has generated a 27 percent increase in sales over the previous year.

The effect of this product prototype build and then its launch has triggered systematic adoption of the PH brand language. Internally, there had been resistance to moving away from the original Pdh color palette of red or purple, based on the belief that they were brand elements that



Figure 2. Images of the range shown at Hannover, including the NitroSource, displaying the full Parker Hannifin color palette (April 2015). [Color figure can be viewed at wileyonlinelibrary.com]

signified Pdh's provenance and therefore carried caché with customers. That palette still dominated, eight years after acquisition by Parker. The NitroSource product built familiarity with the PH gold and gray color palette among the internal teams and attracted positive feedback from the first customers, breaking down resistance to change through its sheer presence. Within a few months of the NitroSource prototype build, the design team was asked to look at a wider brand implementation project. It was to consider the possibility of switching to the PH color palette across the full suite of filtration and gas generation products from three European divisions of PH, each with their own preacquisition color palettes. Several alternatives were considered, some with retained elements of the preacquisition colors and others without. The before-and-after visuals produced to illustrate this process proved so persuasive to the case for reconciling to a single palette that just one year later, the three divisions showed the whole range at Hannover Messe (Europe's biggest industrial

trade show; see Figure 2) in the adopted PH colors.

Although the NitroSource project was not undertaken through a fully customer-centric approach, it introduced industrial design to the company as a complementary activity to current marketing and engineering functions. The project had a strategic role as the first piece of industrial design work to implement the new PH look and feel in accordance with the group's brand guidelines. This led directly to the follow-on work to define a consolidated look and feel for the family of filtration products across three EU sites. In doing so, the team began the process of interpreting those guidelines to suit the PH Gateshead product ranges, for example, by establishing a general design principle to consistently use black for leg, foot, or floor-fixing elements of the product. PH staff saw the product realized as a prototype and heard the positive customer feedback, paving the way for the introduction of the in-house industrial designer some months later. This was reinforced by the subsequent product sales increases. The

project also provided the evidence needed for the team in Gateshead to seek endorsement from the U.S.-based vice president of innovation for the collaborative research plan that would introduce industrial design in-house.

Project 2

In preparation for the introduction of the industrial design function to the business, the collaborative project team identified a potential project area to investigate. It was situated in the food and beverage sector, and the strategic marketing team was considering whether a PH technology for removing impurities from carbon dioxide gas (CO_2) might have potential in new markets. One promising application seemed to be at the point of dispense for carbonated drinks, where preliminary investigation had shown that two of the three ingredients, syrup and water, were certified pure at the point of dispense, but the third, CO_2 , was not. This became the brief for a combined design and marketing investigation of the potential for a new product. Filtering CO_2 supply at its source of production and before being transported and bottled was the norm. There is the possibility of contaminants being introduced during transportation and bottling and from within the gas lines from bottles to the point of use, but this was unlikely to be an issue in industrial applications. However, even these lower risks could be important in CO_2 for human consumption, so there was a potential problem to address.

Together, marketing and design visualized the problem in diagrammatic form and began to define a set of assumptions that they would like to test with customers/end users to inform the development of the overall value proposition (Jones, Coates, McLeay, and Cunningham, 2016). Through this process, PH was able to qualify that the problem was acknowledged by their customers as a real issue worth addressing.

Exploring how the problem might be solved began with a brainstorming session (see Figure 3), based on a series of carefully formulated questions, involving designers, engineers, and project managers. This was staged off-site within a design studio at the university as part of breaking the participants away from their traditional modes of thinking. The questions reframed the problem at a more abstract level and used examples of how comparable problems were solved in other very different

industries to help the participants generate the widest range of ideas. For example, replacement print cartridges were identified as an example of an analogous product in a different market, and both the business model and the digital-authentication technologies of those devices were used to draw an analogy to the filtration opportunity. This triggered several new areas of thinking around smart filters, ranging from those that would know when they need changing and could tell maintenance teams to those that could even let customers know how pure their drink is today, building trust and therefore equity for the drinks brand as a new value stream.

This work demonstrated the capacity to radically innovate the value and meaning of a product to its customer when design approaches are applied, not just to an already constrained technology package (as in Project 1 above) but to a new problem space.

Following the brainstorm, ideas on user interactions, ergonomics, pricing models, product qualities and features, aesthetics, and technical configurations were all used to stimulate design development. Sketches and appearance prototypes were produced and taken to potential customers to stimulate a discussion about what was valuable and not so valuable. The level of engagement achieved with these few lead customers enabled them to share relevant ideas and contribute to improving integration with their existing equipment and maintenance routines.

With a clearer understanding of the product opportunity now defined, the business potential was considered in greater detail and potential major customers identified and approached. This has led to a collaborative (and transparent) partnership with a key customer to undertake product efficacy trials with a view to adopting the technology as part of the way they operate. The visual problem statement produced at the outset of the project has also generated a discussion in the wider drinks industry, which has led the industry representative body, the International Society of Beverage Technologists, to change its members' guidelines to recommend point-of-dispense filtration. PH is now in a primary position to respond to that new market opportunity. The project is ongoing.

The approach used in this project enabled the industrial designer and others to fully engage with

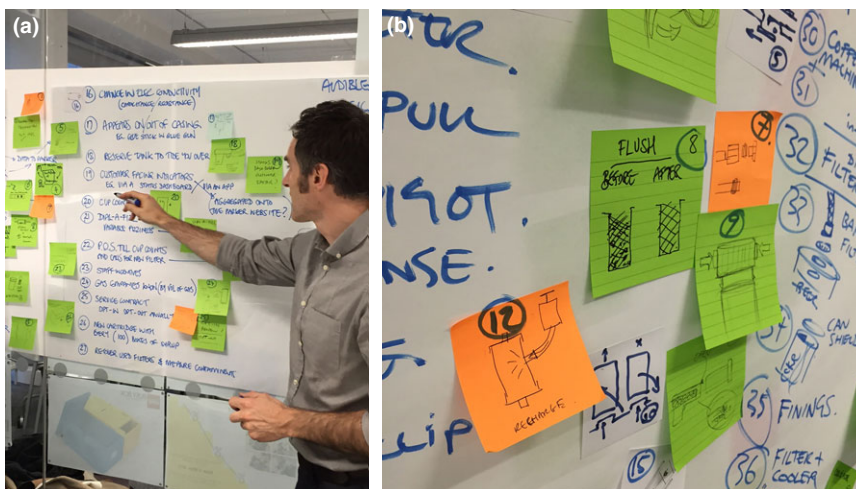


Figure 3. Structured brainstorming session at the university. [Color figure can be viewed at wileyonlinelibrary.com]

anticipated customers, showing sketches, images, and prototypes to test assumptions about the likely product requirements. This resulted in the identification of a key insight when the customer handled the appearance prototype, which concerned fixing the new product to existing installed equipment. This had not been expressed in any discussions up to that point. New user interactions were also proposed, which could make maintenance a safe process for a different range of users and would provide a distinctive and potentially more memorable interaction. The company was able to understand the value of such a new product to its potential customers before the technical requirements (in terms of filtration performance) had been fully defined. This allowed the costs of researching and optimizing technical performance to be rescheduled to a time after market desirability had been established. This also presented new challenges because once the market desirability was established, the careful process of realizing that product as a reliable and effective device worthy of the PH brand is subject to greater time pressure because of the need to reach the market as quickly as is reasonably possible. In this instance, additional engineering resources were bought in, which indicates the importance the company placed on this new opportunity.

This project attracted the attention of PH's head office and reinforced the view that the Gateshead site had dynamic leadership and was

capable of investigative, market-defining, strategic innovation.

Project 3

With the introduction of the industrial design capability and parallel development of a strategic marketing team, there was an opportunity to consider the nature of the office space at the Gateshead site. After Project 2, the new focus on innovation at the Gateshead site had been noted by senior executives in the international business. Proposals were made by the DMM to better equip the office spaces for team-based projects to continue to promote this approach. This was not a project that had been anticipated in the collaborative project plan at the outset of the partnership. It had been made possible by the growing acceptance that innovation was core to the future of the business in Gateshead and that the site had positioned itself, in the eyes of the group, as effective at adopting key corporate priorities. A project was initiated to rethink the office space as part of promoting better integration between the growing strategic marketing team, new innovation and design capacity, and the more established engineering team. The three functions shared a long open-plan office, but thoroughfares to the shop floor and a general lack of breakout space limited the amount of incidental communication and collaboration that an open-plan office might have offered.

Space was allocated within this open-plan office and some visualization work commissioned externally

before a budget was secured to build a new collaboration and creative-thinking space. Once instated, this became something of a flagship space, with key visitors, customers, and executives being shown the space as a physical representation of a new, progressive approach.

The members of the senior management team in Gateshead are clearly proud of the space and the narrative around innovation that it affords them.

The space was created as a nonbookable space that can be used to collect a multidisciplinary team around an issue in a quick and informal way as well as hosting structured project workshops and brainstorming. Wall graphics promote design processes, and the colors in the new space reflect the PH brand guidelines. It has been called Ideas-Lab, following the name of PH's online suggestion-box process for surfacing and prioritizing new product ideas from staff and stakeholders (see Figure 4).

Having been commissioned by the strategic marketing group and being situated near them, many of the early activities in the space were led by marketing, which created a perception that the space was actually theirs and not truly a shared-use space. However, over a period of about 12 months, this perception has been broken down and the space has become well used for team-based discussion and problem-solving sessions with all disciplines involved. The new space is designed to support such multidisciplinary approaches in



Figure 4. The Ideas-Lab space, created for multidisciplinary collaboration. [Color figure can be viewed at wileyonlinelibrary.com]

the early phase of exploring new market areas. Because many of the approaches and facilitation process skills used in innovation teams mirror design thinking and visual problem solving, the promotion of the space has simultaneously helped to affirm the role of industrial design in the business going forward. Hence, the physical space symbolizes the strategic commitment the company has made to embedding the new design discipline, to the full adoption of new PH branding, and to putting a new emphasis on innovation as a multidisciplinary activity.

Perhaps most important of all, it shows that developing a culture of innovation is not a fad or a temporary obsession. Physical changes to the space are not easy to reverse and have clearly had some investment, so the

Ideas-Lab demonstrates an absolute commitment to nurturing an innovation-focused organizational culture (Hatch and Schultz, 2008). It is realized to a high specification and manifests the change toward brand coherence and corporate self-belief. It has already had a striking impact on the wider corporation, creating the expectation that every Parker site might develop such a space. If this becomes organizational policy, the introduction of these physical innovation spaces would provide a channel for the value of design thinking (through the industrial design function) to propagate across the group as confidence in its effectiveness at the PH Gateshead site is established. With this in mind, some of the design-thinking methods that have worked well to date are currently being assembled into a workshop-facilitator's toolkit for use with multidisciplinary teams.

Project 4

From the outset of the collaboration, emphasis had been put on ensuring that the customer-centric innovation approaches, developed and rehearsed through successive projects, be codified and embedded in the organization. Having worked on a range of projects, including the key Projects 1 and 2 reported above, the academic team and the industrial designer worked on defining the key actions for industrial design. PH had a comprehensive but fairly new set of processes for innovation when this study began. Staff were trained in the processes when they joined the

company; however, as in any organization, there had been a tendency to fit the procedures to the available expertise and resources, so adoption was still in progress. PH corporate innovation processes encompassed a market analysis tool, Winmap; a stage and gate new product development tool, Winovation; and a price-positioning tool, Winvalue. The academic team and the industrial designer used the knowledge and experience gained from the projects undertaken during the preceding stages of the partnership to develop, document, and map industrial design-focused tasks to the existing processes. This was a collaborative activity with colleagues from engineering and marketing who were undertaking a similar mapping process for their own function. The Winovation process can be considered as an overarching framework with various levels of activity and measures to allow projects to progress to the next stage or substage. One of the most valuable parts of this process was that this stimulated discussion and negotiation between marketing, engineering, project management, and industrial design—in order to agree and assign task activity, ownership, and contribution to each function.

This final phase of the partnership work is captured in the company documentation (Figures 5 and 6), and demonstrates that the industrial design function is now being negotiated into a fully defined relationship with the other disciplines in the business. This includes taking an ownership role in some of the early

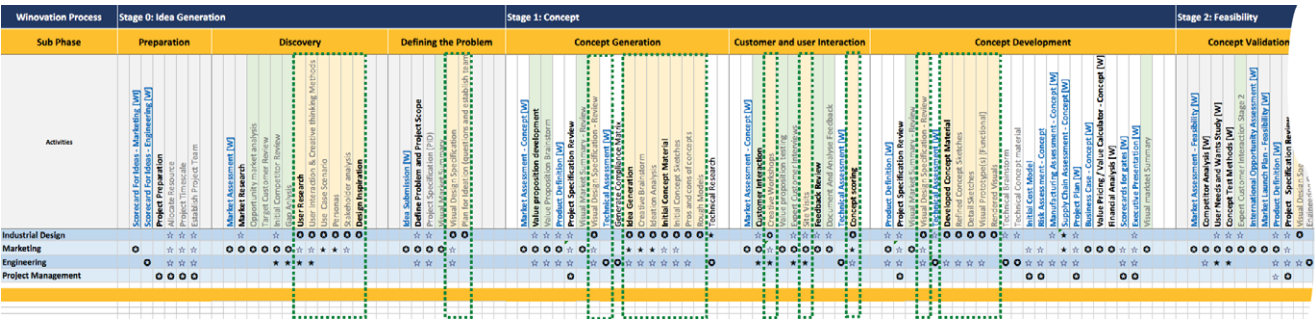


Figure 5. Winovation management spreadsheet—this excerpt shows approximately the first half of the Parker innovation process document. Vertical frames of dotted-lines have been added to the figure, highlighting key activities for Industrial Design (ID). The document is evidence of the significant responsibility that ID now takes during the front-end of the organisation’s innovation process. [Color figure can be viewed at wileyonlinelibrary.com]

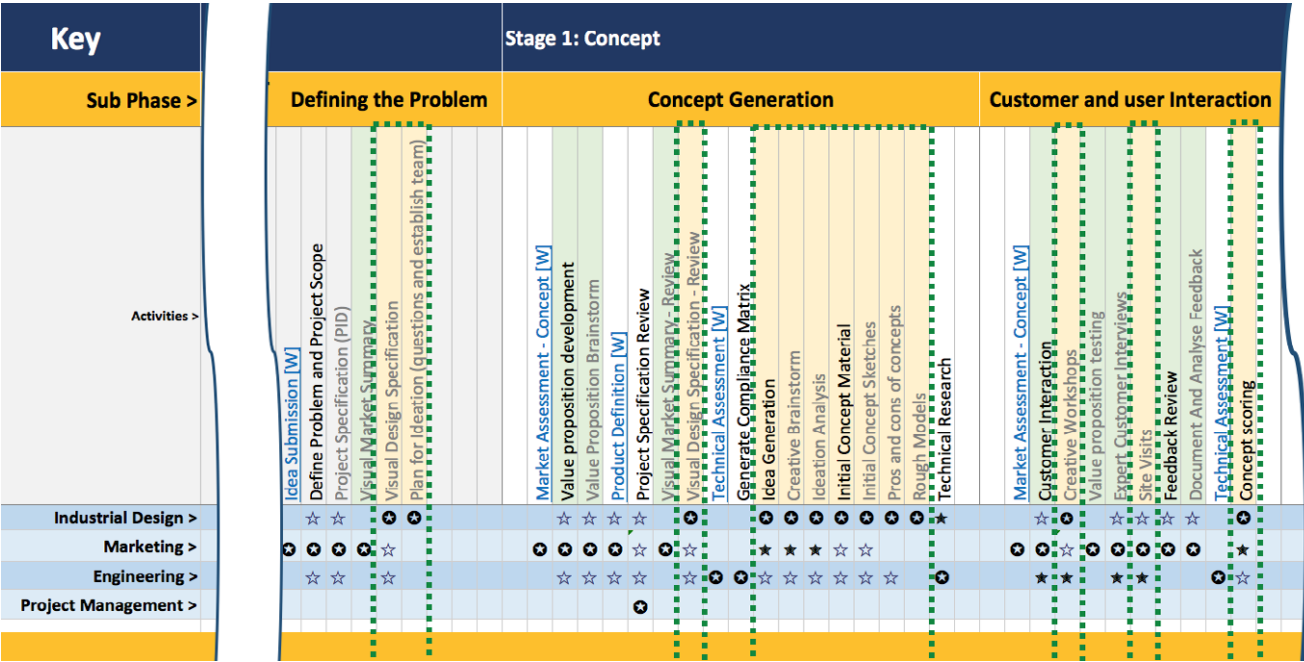


Figure 6. Detail from the process document—this figure shows the specific customer-centric tasks identified for the ID function in more detail. The symbols below each activity show how responsibility for each task has been negotiated across the multidisciplinary project teams. KEY: ● Leads/owns the task; ★ Involved/supports; ☆ Contributes as required [Color figure can be viewed at wileyonlinelibrary.com]

phases of the innovation process—a role for design that would not have been possible at the time of Project 1. The importance of the facilitation role in multidisciplinary teams has also now been recognized and captured in organizational policy as well as celebrated through the graphical

process maps in the new Ideas-Lab innovation space. This process of close, interdisciplinary negotiation has been open and positive but has still raised issues and challenges. For example, it revealed a concern that innovation was being discussed as a design-

based activity and that this fails to recognize the innovation contribution made by the engineering team. Similarly, there was a willingness and appetite among the engineering team to be involved in the customer-research elements of the innovation process, having found

that their own contact with customers had gradually diminished in recent years.

Conclusion

This case study and the individual projects within it demonstrate a staged approach to establishing a customer-centric innovation capability in a mature, technology-centric organization. It has involved developing the organization's own confidence about the value and fit of industrial design through a series of projects and regular reflection on what is working well and not so well and what is raising concerns along the way. Rather than decry design's lack of influence at the board level, it accepts a reflective process of building trust around the discipline through practice and its demonstrable achievements.

It shows a logical progression from demonstration of operational and tactical design input in terms of product aesthetics and interpretation of corporate brand language in Project 1 and through demonstrating the capacity to investigate and define new markets through a customer-centric approach to innovation in Project 2. In Projects 3 and 4, it demonstrates design's capacity to influence culture and policy, initially within PH Gateshead but with plans to extend that across the group in the future. As such, it provides an alternative approach to attempting to develop and implement a preformulated grand plan for design.

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In this case study, the divisional marketing manager (coauthor McPherson) was a driving force for change both inside and outside the customer-centric innovation project. His commitment and openness throughout energized the whole program of work, and the academic team would like to take this opportunity to thank him.

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Matthew Lievesley—Reader in Human Centred Problem Solving, Director of Business & Engagement, Northumbria University School of Design

Alongside his academic role in one of the UK's leading design schools, Matthew has a track record of forming open and effective business partnerships. He works with a range of research and innovation funders to help companies and public-sector organizations benefit from the Design School's knowledge and expertise.

Trained in both design and business, Matthew manages research and design projects across disciplines, from digital media through product and brand and into service design. This can involve leading user-centered design projects to define new product or service opportunities, growing an in-house “Design Department” inside a business, or researching and evolving new design methods to suit a particular requirement. He is a passionate advocate of business improvement through design and brings this to his core teaching topics in Industrial Design, Design Management, and Innovation.

David O’ Leary—Course Leader BA (Hons) Design for Industry, Northumbria University School of Design

David graduated with a BA (Hons) Industrial Design (Eng) from Teesside University in 1997, including an internship with IDEO in Boston, USA (1995–1996). Since then, he has worked as an industrial designer and design educator, working for local, national, and international clients. He has worked in the design department at Northumbria since 2006, progressing to a full-time role in 2010, then taking up the role of Programme Leader for the BA (Hons) Design for Industry course (2013–2017). He has significant experience in design and manufacture, ranging from batch manufacture of medical and scientific equipment to mass manufacture of plastic goods. His day-to-day role also includes working closely with a diverse range

of businesses, from local charities to global blue-chip companies. He strives to make a positive difference to the world through design.

Callum Whitehead—Industrial Designer, Parker Hannifin Corporation

In 2014, after graduating in industrial design, Callum Whitehead joined Parker Hannifin, as a Knowledge Transfer Partnership (KTP) collaborating with Northumbria University to embed industrial design as a new function within the business.

He brought new creative design methods such as facilitating creative brainstorming, free-hand sketching, visual renders, and rapid prototyping, among others. He has embedded these activities into the organizations’ global NPD process, as well as developing a series of customer-centric design toolkits. Industrial design is now used to drive the early concept development for all relevant projects.

Callum continues to grow the function as he works with other Parker divisions across the world. Prior to working with Parker, Callum designed for retail interiors, point of sale, and exhibitions. More recently, he received his master’s in design at Northumbria University.

Ian Hewitt—Senior Lecturer, Northumbria University School of Design

Ian Hewitt is an Industrial Designer and a senior lecturer, teaching on the BA (Hons) Design for Industry program at Northumbria University. With over 18 years

of practical industrial design experience, his knowledge spans both the public and private sector in both the UK and US. Ian is about to embark on a PhD to explore playfulness as an approach to learning and developing better design practices, influenced by and incorporating visual design communication for future teaching activities.

Neil McPherson—Division Marketing Manager, Parker Hannifin Corporation

Over the past 20 years, Neil has worked in Industrial, Life Science, and Food and Beverage markets, successfully developing business for gas generation and compressed air treatment products. He has experience in both sales and marketing disciplines—developing strategic key accounts and developing OEM customers—and in recent years, has focused on strategic marketing, new product development, and brand management.

During his career with Parker Hannifin, Neil has developed new business in Asia, EMEA, and also North America, where he had full P&L responsibility for the gas generation business operating out of Charlotte, NC. His current role is that of Platform Marketing Manager for Parker’s compressed air and gas treatment business, which includes three manufacturing locations in Europe.

Craig Annal—Principle Engineer, Parker Hannifin Corporation

With over 15 years’ experience in new product development, Craig has a proven track record of bringing

many successful products to market. From conceptual design to first manufacture, Craig has led teams to successfully engineer products and systems to meet with a range of

customer needs across a multitude of markets. With a passion for innovation, thorough understanding of the new product development processes, and excellent coaching and mentoring

skills, Craig was the ideal candidate to assist in a program to embed industrial design into the company processes and culture.