ITERATIONS

Design Research & Practice Review

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DESIGNERS
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Alen Keirnan / RMIT, Future Social Service Institute, Melbourne, Australia
Peter Robbins, Frank Devitt, Trevor Vaugh, Martin Ryan / Department of Design Innovation, Maynooth University
Rachael Koffel / Swinburne University, Faculty of Health, Arts and Design, Melbourne, Australia

How Irish design consultancies align with Ireland's Innovation 2020 priorities:
a preliminary study

The Government of Ireland has positioned design as integral to the innovation landscape. In particular, it encourages innovations from designers that align with six thematic areas identified in the Innovation 2020 report. Those areas are health & medical, information & technology communications (ITC), food, energy, manufacturing & materials and service & business processes. However, research is yet to show the current contribution of design consultancies and their project outcomes categorised within these six priority thematic areas. This paper presents empirical findings on a review of 571 projects advertised on the websites of 26 design consultancies in Ireland. It shows that just under half of the reviewed design projects fall within the thematic project areas. Furthermore, this paper shows the differences between three design disciplines (product design, user-experience design and branding design) and their contribution of projects to each thematic area. The results of this empirical study are relevant and of use to design practitioners, clients and policy makers. For designers, this research identifies opportunities for new business and innovation within the Government of Ireland key thematic areas. For design clients, this research offers opportunities to seek input from relevant design disciplines according to the thematic alignment of their project. For policy makers, this research offers context of the six key thematic areas within the design disciplines in Ireland. Lastly, the results of this research suggest that across the disciplines of product, user-experience and branding design, preferred priority themes are evident.

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Introduction

A global innovation race is now in progress and each country has vowed to attain the globally recognised status as *'innovation leader'* (European Innovation Scoreboard, 2017). Governments, industries, and educational institutions have each released policies and strategies where innovation is the common focus and leading driver for policy development, economic growth, industry development and social wealth (Department of Business, Enterprise and Innovation 2015). This paper explores Innovation in Ireland and the contribution and role of design to achieve the Innovation 2020 targets (Department of Business, Enterprise and Innovation, 2015). One such target for Ireland is to be among the European

Union's leading innovators. To achieve the status of innovation leader a considered approach to innovation across business and industry is imperative. Their strategy to position Ireland as a leading innovator is based on the demonstrated value and processes offered by design (Department of Business, Enterprise and Innovation, 2015). In a landscape of complexity and ambiguity, design methodologies, processes and thinking is attractive to industry in solving challenges that are often wicked and complex (Dorst, 2011). The Minister for Jobs, Enterprise and Innovation, Mary Mitchell O'Connor advocated the role of design as the key in Ireland's innovation agenda given its demonstrated capacity to deliver quality, value and ongoing business opportunity (Institute Designers Dublin,

2016). Furthermore, for every one euro expended on design innovation there is an estimated increase in revenue of up to 20 Euros (Institute Designers Ireland, 2016). One measure of innovation is sales and impact (European Innovation Scoreboard, 2017), therefore it is only relevant that design processes play a significant role in Ireland's innovation landscape. In an innovation environment where the leading innovators are Sweden, Germany and Finland, the Government of Ireland has placed itself in a position to take full advantage of the value adding that design innovation provides to business and industry (European Innovation Scoreboard, 2017). This positioning is demonstrated in the Government's identification of six key thematic areas to which design, designers and industry are asked to concentrate their focus. The thematic priority areas identified by the Government of Ireland are:

1   Information Communication Technology
2   Health & Medical
3   Food
4   Energy
5   Manufacturing & Materials and
6   Services & Business processes.

Ireland has increased the public awareness, opportunity for funding, and commitment in promoting the value of design-driven innovation as a key component in the innovation eco-system. It is seen by the Government of Ireland as a value provider in developing innovations within the six thematic areas (Department of Business, Enterprise and Innovation, 2015). A number of strategic reports have since been published to support the role of design and offer knowledge into the capacity of Ireland to leverage its design community, networks and local skills (Kennedy, 2016). Kennedy (2016) shows that Ireland's largest design sector is craft design, accounting for more than 2768 registered businesses (Kennedy, 2016). Architecture, communication design and digital design come next with an albeit smaller registered sample (527;395;174 registered practices). The capacity in which Ireland has the least registered practices are Industrial and Product design with only 24 registered design practises (Kennedy, 2016). While a majority of design businesses in Ireland are small sole traders, the value that design affords to the innovation landscape in Ireland is impressive. Furthermore, as the

job market for designers in Ireland continues to encompass wider design disciplines to address commercial and societal challenges (Kiernan & Ledwith, 2014), education institutes in Ireland have adopted design-led innovation programs such as the Masters in Food Innovation, at Maynooth University's Department of Design Innovation. Research about design in Ireland is concerned about three themes; value for business (Robbins & O'Gormon, 2016), design education (Kiernan & Ledwith, 2014), and the capacity of design in Ireland (Kennedy, 2016).

The government targets represent an output from a rigorous future forecasting scenario planning exercise and therefore are intended to portray an ideal future scenario where design will align with national economic priorities. Hence, it is to be expected that there is currently a misalignment between what designers are actually working on and what the government would prefer them to be doing. While the Government of Ireland has identified six key thematic areas for design consultancies to address and position their projects within, there is little research into the current distribution of projects that already fall within the six priority areas and whether there are any gaps or potential opportunities that exist for innovation which could be addressed further by the Government. This research explores how design consultancies' output thematically align with the themes outlined in Government's innovation agenda. Here, the authors ask the following research questions about design in Ireland.

1   How are projects distributed across the six priority themes?
2   Do different disciplines focus on different priority themes?
3   How are themes distributed within each discipline?

Method

Three disciplines were selected for this study. They are product design (Industrial Design), user-experience design (Digital Design) and branding design (Communication Design). The three disciplines were chosen given their prevalence within design industry in Ireland. Due to available resources and the scope of this study, a targeted sample was selected from consultancies who have a website that provide adequate description of their work output and projects. Twenty-

six design consultancies across the three disciplines were included in this study and categorized either as a product design, user-experience, or branding design consultancy based on how the consultancy identified its output. In addition, the categorization was determined by the consultancies about page. Due to the preliminary nature of this study and available resources, consultancies that used their website as a commercial product purchase platform (e.g. – start-ups) were excluded from this study. Additionally, craft as a design discipline was excluded from this study given its proportional bias in Ireland and large numbers of individual makers and designers. Future research can consider the inclusion of craft as a discipline. In some cases, design consultancies listed 'conceptual' projects intended to demonstrate their thinking styles and areas of expertise to potential clients. Often, these conceptual projects were not sponsored or paid for by industry clients. Therefore, designed outputs that were not sponsored or paid for by an industry partner were also excluded. Next, the researchers reviewed all available and advertised projects showcasing the consultancies previous work across the three design disciplines. The categorisation of advertised design projects was achieved using the sub-group description of each of the six key thematic areas (Department of Business, Enterprise and Innovation, 2015). For example, if the project was classified as a health and medical theme, the criteria involved the researchers asking if the project was a) for connected health and independent living, or b) a medical device, a diagnostic tool, or used for a therapeutic purpose. Similarly, if the project was classified as an ICT theme, its function was a) about future networks and communications, b) data analytics, management, security and privacy, or c) digital platforms and content applications. Table 1 shows the categorisation criteria. Consultancies who described a select few projects as case studies often had included

TABLE 1: Categorisation criteria used to classify the advertised projects into each thematic area. Criteria was compiled from the Innovation 2020 report (2015)

Thematic area	*Clasification Criteria*
Information Communication Technology	Is the project about; a) future networks and communication? b) data anaytlytics, management, security & privacy? c) Digital platforms, content & applications?
Health and Medical	Is the project about; a) Connected health & independent living? b) Medical devics, diagnostics or therapeutics?
Food	Is the project about; a) Food for health? b) Sustainable food production and processing?
Energy	Is the project about; a) Marine renewable energy? b) Smart grids & smart cities?
Manufacturing and Materials	Is the project about; a) Manufacturing competitiveness? b) Processing technologies & novel materials?
Services and Business Processes	Is the project about; a) Innovation in services and business processes?

the project outcome as a separate feature tile while describing the process in which they had arrived at the project outcome in a case-study tile on their webpage. For this reason, projects that were excluded from this study were ones that were presented as case-studies to avoid doubling up of data. Furthermore, consultancies that did not advertise any projects on their website were excluded from this study.

All data was recorded and cleaned in SPSS, a statistical software package. The data was then subject to a one-way ANOVA and independent samples T-Test to identify any significant differences across the distribution of projects according to design discipline and theme.

Results

This article asked three research questions about the distribution of thematic areas across three design disciplines. The following three sections will report the results for each research question asked in this preliminary study.

How are projects distributed across the six priority themes?

Descriptive statistics revealed that a total of 571 advertised design projects were reviewed across the three design disciplines. Branding design was the most reviewed discipline accounting for 45% (255 projects) of the total number of reviewed projects. Compared to other disciplines, Product Design had a larger portion (73%) of projects within the Government's thematic areas compared to other areas. User Experience design and Branding Design had 34% and 39%,

respectively. This is interesting given that product design consultancies make up the smallest sector of design consultancies in Ireland (Kennedy, 2016).

The descriptive statistics show that across all design disciplines, a significant proportion of projects fell outside of the thematic scope of project themes identified by the Government of Ireland, accounting for 54% of the total number of reviewed design projects. From the 571 projects reviewed in this study, 46% fell within the criteria for inclusion in the scope of thematic related projects. This misalignment is a strong and timely signal to policy makers that some incentives may be needed to drive more design work towards the designated areas. Food (33%) and health and medical (26%) related projects made up the largest priority area, accounting for 59% of all projects that fell within the scope of the thematic areas, while energy (5%) and service and business processes (4%) accounted for the least.

Do different disciplines focus on different priority themes?

This research article categorised the distribution of projects within thematic priority areas across user-experience design, product design and branding design. It was found that different disciplines focus on different priority themes. A one-way ANOVA analysis revealed significant differences concerning the distribution of design projects across health and medical, food and ICT. However, no significant difference was observed between the energy, manufacturing & materials, and services & business processes priority themes. Table 4

TABLE 2: Distribution of projects within thematic and non-thematic areas across three design disciplines. Product design is the only discipline to work more within the thematic areas.

Design Discipline	Number of non-thematic projects	(%)	Number of thematic projects	(%)	Total
User-Experience Design (n=8)	113	(66%)	58	(34%)	171
Product Design (n=7)	39	(27%)	106	(73%)	145
Branding Design (n=11)	156	(61%)	99	(39%)	255
Total Disciplines (n=26)	**308**	**(54%)**	**263**	**(46%)**	**571**

shows the distribution of thematic projects across the three reviewed disciplines. Information & Communication Technology – Product Design Domain. Within the ICT thematic area, product designers tended to focus on more projects related to ICT, than branding designers (p=<0.05). Within branding design, only 5% of projects fell within the ICT theme, compared to product designs 23% of ICT themed projects. There was no significant difference observed between product design and the user-experience design disciplines concerning the ICT theme. Within the ICT thematic area, product design projects included housing units for security systems and drone design for virtual reality engagement. The physical manifestation of these projects traditionally fall within the field of product and industrial design, offering an explanation as to the distribution of projects within the product design discipline and the ICT thematic area.

Health and Medical – Product Design Domain. A one-way ANOVA revealed significant differences between the focus of projects within the health & medical thematic area and the three design disciplines. The results showed that the product design discipline revealed a greater distribution of projects within the health and medical thematic area when compared to the user-experience design (p=<0.05), and branding design disciplines (p=<0.05). Reviewed product design projects within the health and medical thematic area included medical devices and monitoring & diagnostic devices.

Food – Branding Design Domain. Across all three disciplines, a significant difference was observed between branding design, and both user-experience design (p=<0.05) and product design (p=<0.05). It was found the branding design discipline contributed more designed outcomes to the food thematic area than any other discipline. Projects included food packaging and branding new food products.

Energy, Manufacturing & Materials, Services & Business Processes. No significant difference was observed between the distribution of projects within energy, manufacturing and materials, services and business processes. These results suggest that across the three design disciplines there is an even distribution of project preference concerning the three thematic areas.

How are themes distributed within discipline specific projects?
Significant differences were observed between the preference of themes across product design, user-experience design and branding design. However, it is also useful to determine if each discipline varies their project focus within their discipline to stay competitive against other discipline related consultancies. Here, we discuss the differences of project themes within each discipline.

User-Experience design. A relatively even distribution of projects aligned with the priority themes within the user-experience discipline was observed. The data suggests that the discipline of user-experience design

TABLE 3: Distribution of projects within thematic areas by area theme. Food (33%) and health and medical (26%) related projects made up the largest priority area.

Thematic area	No. advertised Design Projects	% of advertised Design Projects
Information Communication Technology	43	16%
Health and Medical	69	26%
Food	86	33%
Energy	13	5%
Manufacturing and Materials	29	12%
Services and Business Processes	23	4%
Total	**263**	**100%**

is a multi-thematic discipline applying their skill set to a broad range of projects. While the descriptive statistics revealed that 26% of all projects reviewed from user-experience design disciplines were food related and 22% were ICT related, there was no statistical difference to suggest the user-experience discipline prefers either theme within its field. However, a strong positive correlation was observed between ICT and food themed projects ($r=0.943$, $p=<0.05$). The results suggest that an increase in ICT related projects sees an increase in food themed projects within the user-experience design discipline. There was no significant difference between the preference of projects across the thematic areas.

Product design. Product design saw the greatest internal differences of projects distributed within the thematic areas. The results showed that within the product design discipline there is a preference for health & medical related projects. A significant difference was found between the frequency of health & medical projects when compared to: ICT projects ($p=<0.05$); Food projects ($p=<0.05$); and Service & Business Processes projects ($p=<0.05$). A number of strong positive correlations was also observed between health & medical projects and ICT projects ($r=0.931$, $p=0.002$); food projects and manufacturing & materials projects ($r=0.824$, $p=0.023$); and manufacturing & materials and services & business projects ($r=0.818$, $p=0.025$). These results suggest that product design as a discipline tend to prefer health and medical thematic projects. This is expected given Irelands relatively well

known export market for medical devices to neighbouring and global countries.

Branding Design. The branding design discipline saw 63% of their project distribution within the Food thematic area. Projects within this category included package and branding design for new and existing food products. A significant difference within the branding design discipline emerged between food and ICT ($p=<0.05$), health & medical ($p=<0.05$), manufacturing & materials ($p=<0.05$), services & business processes ($p=<0.05$) and energy ($p=<0.05$). The results suggest that as a discipline, branding designers tend to work uniformly within the food thematic areas compared to the remaining thematic areas. No correlations were observed within the thematic alignment of projects.

Discussion

Adding to the body of literature about design in Ireland, this article shows the distribution of design projects across the six thematic priority areas identified by the Government of Ireland (Department of Business, Enterprise and Innovation, 2015). The design community in Ireland has a significant amount of their projects outcomes sitting within the six thematic priority areas, with 46% of all reviewed projects falling within the scope of the thematic areas. This result supports the role of design in creating value across the sectors of medical & health, ICT, food, energy, manufacturing & materials, and business & service processes. While this article shows the percentage of projects that fall within

TABLE 4: Distribution of projects within thematic areas across three design disciplines

Thematic area	Product Design		UX Design		Branding Design	
Information Communication Technology	25	23%	13	22%	5	5%
Health and Medical	39	37%	10	17%	20	20%
Food	9	9%	15	26%	62	63%
Energy	6	6%	1	2%	6	6%
Manufacturing and Materials	13	12%	11	19%	5	5%
Services and Business Processes	14	13%	8	14%	1	1%
Total	**106**	**100%**	**58**	**100%**	**99**	**100%**

the six priority themes, further opportunities for research exist in exploring and identifying design activities that fall outside of the six key priority themes as determined by the Government. The potential practical application for these findings could be used to guide industry when wanting to engage with design consultancies and the Government's design innovation agenda.

Furthermore, these findings have shown the existence of a preference for particular themes within the design disciplines of product and branding design. For product designers, projects within the health & medical and information & communication technology fields are preferred, while for branding, food related projects are popular. It is interesting that for the smallest discipline in Ireland, product design accounts for the majority of project contributions within the six thematic areas. User-experience design, while showing no significant difference in preference for priority themes was shown to apply their thinking and domain skills relatively evenly across all six thematic areas. This article demonstrates the project preferences and expertise of design disciplines across the six thematic areas, enabling practitioners, clients and policy makers to better tailor projects and project interests according to design disciplines. Furthermore, more projects outside of the thematic preferences within each discipline could encourage and foster deeper and more impacting innovations. For example, while the product design discipline is the leading contributor toward health & medical related projects, it would be useful to consider the scope and contribution that branding disciplines can have within the health & medical priority theme.

Accounting for 33% of all projects, the food thematic area was the most contributed to by design disciplines in Ireland, followed by health & medical (26%). Largely, the results are positive. However, when the results are expressed as theme specific, gaps emerge. Designers least contribute to the thematic area of energy and service & business processes. A limitation of this study was the exclusion of service design as a discipline given its late emergence as a discipline of design in Ireland. While service design gained popularity within industry after the 2006 Emergence Conference (Sanders, 2008), the discipline has only begun to grow in Ireland with the first service design network being established in 2017 (Fossick, 2017). The emergence of service design as a discipline would most likely see greater contributions to the themes of energy and business & service processes.

Conclusion

Design and design driven innovation is a key tool in positioning Ireland as 'leading innovators' within the European Union Innovation Scoreboard. To achieve this status, designers, design consultancies and industry are encouraged to direct their innovations within six thematic priority areas. Until recently, little was known about the current landscape of design contributions within these six thematic areas. While research about design in Ireland has primarily examined the topics of design education, value of design for business and the capacity of design in Ireland, little was known about the key Government strategic themes and their distribution across design consultancies in Ireland. This research has contributed knowledge about the preference of the six strategic themes listed by the Government of Ireland across three disciplines, while also considering the discipline specific interest of three design disciplines in Ireland. While the results advocate for the role and value of design in Ireland's innovation agenda, more work should encourage industry to seek the professional input of Irish design consultancies across the six thematic areas. Also, future work should replicate this study with the inclusion of a wider sample of design disciplines, namely architecture, service design and the crafts. Lastly, further validation is required to determine if the total current allocation of design projects in this study that fall within the six thematic areas (46%) is sufficient to meet the needs of the innovation agenda in Ireland.

"This result supports the role of design in creating value across the sectors of medical & health, ICT, food, energy, manufacturing & materials, and business & service processes. While this article shows the percentage of projects that fall within the six priority themes, further opportunities for research exist in exploring and identifying design activities that fall outside of the six key priority themes as determined by the Government."