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A NEW CONSUMERISM: THE INFLUENCE OF SOCIAL TECHNOLOGIES ON PRODUCT DESIGN

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ABSTRACT

Social media has enabled a new style of consumerism. Consumers are no longer passive recipients; instead they are assuming active and participatory roles in product design and production, facilitated by interaction and collaboration in virtual communities. This new participatory culture is blurring the boundaries between the specific roles of designer, consumer and producer, creating entrepreneurial opportunities for designers, and empowering consumers to influence product strategies.

Evolving designer-consumer interactions are enabling an enhanced model of co-production, through a value-adding social exchange that is driving changes in consumer behaviour and influencing both product strategies and design practice. The consumer is now a knowledgeable participant, or prosumer, who can contribute to user-centered research through crowd sourcing, collaborate and co-create through open-source or open-innovation platforms, assist creative endeavors by pledging venture capital through crowd funding and advocate the product in blogs and forums. Social media-enabled product implementation strategies working in conjunction with digital production technologies (e.g. additive manufacture), enable consumer-directed adaptive customisation, product personalisation, and self-production, with once passive consumers becoming product producers.

Not only is social media driving unprecedented consumer engagement and significant behavioural change, it is emerging as a major enabler of design entrepreneurship, creating new collaborative opportunities. Innovative processes in design practice are emerging, such as the provision of digital artifacts and customisable product frameworks, rather than standardised manufactured solutions.

This paper examines the influence of social media-enabled product strategies on the methodology of the next generation of product designers, and discusses the need for an educational response.

Keywords: product design, participatory culture, design entrepreneurship, prosumer, producer

1 INTRODUCTION

Social media (or Web 2.0) is emerging as a major enabler of design entrepreneurship and is facilitating new consumer engagement and design methodologies. New user groups are motivated to participate in the new product development process and the traditional roles of the consumer and the designers are being challenged and becoming more ambiguous. From a design perspective, social technologies present opportunities, challenges and risks as consumers assume new roles as co-designers, co-creators, co-developers [1] and with the utilization of 3D printing, co-producers. Additive manufacture and digital production technologies are encouraging the rise of the user-maker and enabling consumer-directed adaptive customization and product personalization. Concurrently, social technology interaction is providing new user engagement and collaborative opportunities; facilitating a new participatory culture, where consumers are active participants rather than passive recipients. This has implications for the practice of new product development as consumer expectations and behaviour evolves and co-creation becomes the norm. Industrial/product designers may increasingly find that their role is not to deliver a strictly defined and mass-manufactured product outcome. Rather, they may be facilitators in a global co-design process, or required to deliver flexible product platforms where (within designer-defined parameters) the user can adaptively customise, and personalize a product or service outcome. As product development and implementation strategies are increasingly directed through social media, it may be necessary for design educators to respond to a new model of product design where consumers are empowered and enabled in the NPD process and the designers' role is more facilitation rather than resolution [2].

2 THE NEW PARTICIPATORY CULTURE OF CONSUMERISM

Social technologies have led to the imminent promise of unprecedented user participation and collective content generation, sharing and personalisation. Product designers can now expect explicit consumer participation and active engagement in all stages of new product development, from user-centered research, co-design and marketing to product adaptive customisation. This ‘participatory culture’ noted by Jenkins [3], Benkler [4] and others, describes an actively engaged consumer model, where rather than being directed by the end product, the individual contributes directly to the product development or is engaged in its production.

Whilst most of the emerging participatory culture through social technologies has been observed in open-source software development, and other on-line media, the potential for community engagement throughout new product development is an emerging opportunity as consumer passivity lessens and new designer-user relationships and product meanings are expected. The increased consumer engagement with designers and the design process, whilst dramatically impacting product architecture and user ownership, also has the potential to transform possible consumers into product advocates.

2.1 Prosumers, produsers and product produsers

The proactive consumers or ‘prosumers’ identified by Toffler in his book *The Third Wave* [5] are those who are engaged in designing or improving products and services, participating in the outcome rather than being passive recipients. Toffler and later Ritzer et al [6] noted that prosumption was common in pre-industrial societies (the first wave), however the following (second) wave of mass manufacturing and marketisation separated society into the distinct roles of producers and consumers. Whilst the design and production of goods for personal consumption was commonplace prior to the industrial revolution, the dominance of the factory and standardised manufacture disempowered user-makers, and resulted in consumer passivity. Toffler’s ‘third wave’ signals the reintegration of production and consumption, a concept that predates the impact of social media, but which is supported by Kotler’s notions of a ‘prosumer movement’ [7]. Bruns [8] more recently noted the emergence of ‘produsage’ referring to user-led content creation and commons-based peer production typically in a digital media context, (e.g. Wikipedia) where the boundaries between passive consumption and active production are indistinct. These modern ‘digital prosumers’ [6], have paved the way for ‘product produsers’ those consumers who actively contribute to product production which in a new product development context, is enabled by additive and digital manufacturing technologies [2].

2.2 Adaptive customization / product personalization

There has been increasing demand for mass customisation as consumers are empowered in the product development process. Historically it has been difficult to tailor products to the needs of specific users, due to the need for product standardisation resulting from the substantial upfront investment associated with manufacturing, particularly in tooling and assembly processes. However market demands and emerging technologies are facilitating a move to more unique and individual product solutions, with which a greater emotional attachment can be established.

Consumer-driven ‘adaptive customisation’ (where firms produce standardised products that are customisable in the hands of the end-user) [9] is significantly facilitated by digital production technologies that are not dependent on design-determining tooling. Additive manufacture greatly increases product produsage by enabling independent and personalised product generation in a minimal investment production environment. The potential for multiple product iterations, hierarchical scaling and product personalization, creates opportunities for unprecedented customer engagement enabling user-driven innovation. The potential of digital and additive manufacturing aligns with Anderson’s theory of ‘The Long Tail’ [10], where endless choice creates endless demand and all market niches can be catered for and reached through the internet. Both 3D printing and social media are seen as disruptive technologies with great potential for peer-to-peer content sharing and co-creation and new consumer behavior, such as produsage.

2.3 Co-creation

As technology has provided consumers with unlimited communication interaction both with other consumers and companies, consumers are increasingly empowered, and now desire a greater role in the process of value creation [11]. This co-creation process is now considered to be an important manifestation of consumer engagement behavior [12]. This is particularly important in new product

development where consumers contribute new ideas, or suggest product or service improvements, in a model of collaborative co-creation where the consumer is an active participant in the NPD process. This participation has significant benefits with regard to product relevance and targeting, understanding motivations and addressing user needs, increasing product quality and market acceptance, and risk reduction. Consumer involvement in NPD process increases the probability of product success as consumers are more likely to value the product solution [11] and are more likely to move from a passive role to active and unsolicited product advocacy.

However, whilst consumers are able to clearly articulate needs and preferences, there can be inconsistencies in their interest, willingness and ability to participate constructively to the product development process, often lacking the prerequisite skills to contribute on more than a superficial level. Community generated ideas might be novel, but they may not always be feasible for production. Product success requires highly skilled co-creation collaborations between ‘experts’ and community, as is evident in creative collaborative communities and open source / open innovation models.

3 SOCIAL MEDIA AND THE DESIGN PROCESS

Social media which is “characterised by participation, openness, conversation, connectedness and sense of communality” [13], is enabled by Web 2.0 which results from innovation in functionality that allows simultaneous publishing, retrieval and modification by all users in a participatory and a collaborative fashion, also leading to user-generated content [14].

Whilst there is a large social dimension to Web 2.0 with content sharing sites (e.g. YouTube) and social networking (e.g. Facebook), blogs and microblogs (e.g. Twitter) and virtual world interaction, it is the potential of global connectivity to enable new product development that is the focus of this paper. Dittrich et al [15] examined software development and suggested that ‘design’ and ‘use’ should not be regarded as separate and sequential activities, questioning how these different, co-existing practices of design could be more deliberately placed in dynamic relation to each other. This suggests a deliberate strategy is required; one that simultaneously creates and demands engagement between design and use, in turn leading to a new form of consumer participation [16]. Resultantly social technologies require designers to think beyond the provision of artifacts and to deliver value to participants that may be independent of the final product outcome.

3.1 Impact throughout the design process

In recent years, companies have moved from a position of questioning the need for social media involvement, to requiring a cohesive and effective social media strategy. Whilst many companies simply connect with consumers as part of a marketing strategy, increasingly social media engagement is impacting through all business areas, in particular new product development. If one is to examine a typical product design process, such as in Figure 1, it is easy to understand the possible implications of a social media strategy on almost all areas of new product development.

design process →

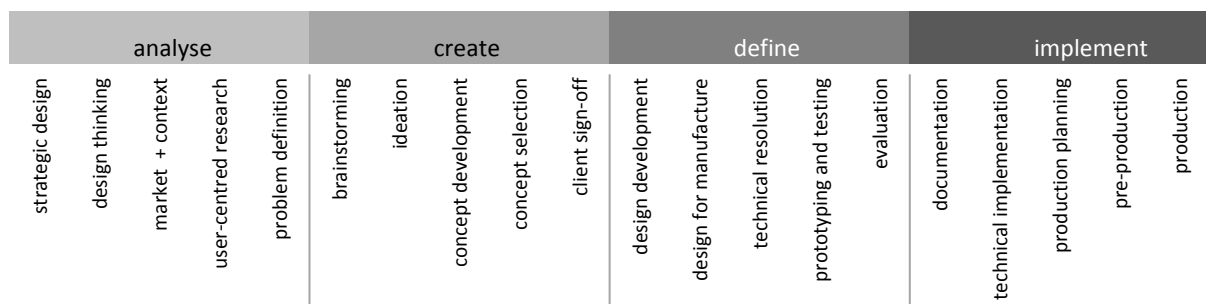


Figure 1. A representative design process

In the ‘analyse’ stage, designers can use crowd sourcing to engage consumers to develop product strategies, conduct market and user-centred research and problem definition, and conduct data mining and social diffusion research. In the ‘create’ stage, design activity from initial ideation through to concept selection can be supported by open-source collaborative design and consumer participation. The design development journey through the ‘define’ stage, may engage more skilled participants (i.e. qualified designers) through open-innovation platforms, whilst the ‘implement’ stage is enabled by

digital production technologies that facilitate home production, customisation and personalisation. In addition, the project can be supported by a product implementation strategy that uses crowd funding to raise venture capital and generate pre-launch ‘hype’, draws on forums and blogs to develop markets, and sales, and social networking sites to analyse consumer behavior and predict emerging trends.

3.2 Impact outside the design process

If we begin to see the designer not just as a supplier of standardized artifacts, but also as a facilitator of collaborative design experiences and the developer of flexible, customizable product frameworks, then social media must occupy a central role in this new design process. It is possible that future roles for designers may not be detail resolution, but the facilitation of product and service possibilities. Entrepreneurial co-creation may require designers to relinquish ‘ownership’ of the design outcome, instead providing the tools and expertise to guide consumers in product design, rather than delivering the artifact. Are design graduates adequately prepared for this new mode of product development?

3.3 The new design entrepreneur

A new model of design practice is emerging where designers will operate more autonomously from established financial, production and supply chains, but more closely with consumers who will be increasingly engaged and inseparable from design and production activities. This new participatory culture will empower both designers and consumers, but in a model vastly different from the supply and demand role of the 20th century product designer. Social technologies can enable designers and consumers to be fully networked in an organizational and behavioural sense, generating consumer behavioural insights, improving communication and collaboration, and providing adaptive, customizable and personalisable product infrastructure. Whilst it is possible that increased integration of ‘novices’ into the design process may be detrimental to successful product outcomes, designers are uniquely positioned to be powerful enablers of value creation. But first they must understand the potential of social media as an enabler of design entrepreneurship and their own roles in consumerism.

4 THE SOCIAL TECHNOLOGIES-ENABLED NPD PROCESS

Social media has enabled a new consumer participatory behaviour. Resultantly designers are responding with innovative new processes, where both expert and novice engagement are integrated into the product development process. This activity has seen the rise of new design entrepreneurialism and creative communities where peer-to-peer collaboration and open source design present new models of consumer interaction, and new business models are emerging.

4.1 Design research

Data mining and social diffusion research allow design researchers to understand changing consumer patterns and to make proactive, knowledge-driven product strategy decisions. Data mining searches data to analyse consumer behavior, find hidden patterns and predict emerging trends, whilst social diffusion research [18] examines the way new ideas and technologies spread through social structures, revealing the evolution of trend spreading dynamics. Social media allows interaction with global communities, facilitating user-centered research. Designers are empowered to engage directly with target markets and end users to define the problem, test ideas and design solutions, and initiate participatory design activities. Broadly dispersed groups and targeted demographics are equally accessible and consumers are empowered by early engagement in the design process, with a sense of ownership over the final outcome. These early inclusive interactions move participants from passive to stakeholder roles, and even to advocacy of the design outcome. ‘FrogMob’ uses an experimental method of ‘guerilla’ research, based on the idea that “anyone can channel their inner design researcher by looking for inspiration from everyday life.” In this model, Frog Design conducts wide-ranging design research by encouraging a global audience to submit product-user experiences; this informs new product development. This crowd sourcing research helps designers understand human behavior and more specifically how people interact with products, services and their immediate environment.

4.2 Crowd funding

Crowd funding websites have proven highly successful in assisting creative initiatives to be promoted, and financed through pledge-based fundraising. Sites such as Kickstarter, Indiegogo, Pozible, Sponsume and Quirky, enable designers to ‘pitch’ an unresolved product ‘concept’ without financial

commitment or inherent risk. Designers can indulge in creative exploration and design risk taking with the knowledge that the project will only proceed with sufficient financial support from interested investors. The main benefits of this approach are that designs are tested for marketability, potential sales are measured and production is financed before too much development time is invested in the product; a distinct advantage for independent design entrepreneurs.

4.3 Open Making

With the phrase “everything is makeable, anytime, anywhere, by anyone” [17] in 2011 Studio Droog launched the ‘design for download’ platform where consumers could adaptively customise then download open-source furniture designs for private production. Using 3D printed and CNC routed components, these furniture designers were empowered to market and sell furniture to a broad market without requiring production and distribution facilities. This model has now been replicated in several forms including SketchChair (a Kickstarter-funded project providing open-source furniture design software which consumers use to design their own CNC routed chairs) and Open Desk, a global community of designers and makers offering products that have been designed for digital fabrication. This ‘Open Making’ model, which was featured in the Design Museum’s “The Future is Here” exhibition, connects customers, designers and makers empowering all stakeholders.

4.4 Crowd storming

Open innovation platforms are global collaboration communities that share ideas and opinions to solve problems and develop product or service solutions. Many crowd sourcing sites (e.g Quirky, Jovoto, Innocentive, Ahhha), uses social ideation or ‘crowdstorming’ to drive product innovation. Crowdstorming leverages the efficiency of social media coupled with innovative workflows to access external talent anywhere at low cost, brainstorming at a global scale for ideas and insights and critical review. The power of brainstorming with thousands of people, rather than with a small internal team, is the essence of crowdstorming. Crowdstorming is evolving from simple open innovation idea searches, to complex interactions where ‘crowds’ are engaged in specialised tasks. This enables companies to develop new consumer engagements and to open up their innovation processes. Many companies are now integrating crowdstorming into their business models to bring better products and services to market, for example GE’s Ecomagination challenge to innovate power grid technology, Lego’s Cuusoo platform (where if an ideas gets 10,000 votes Lego will consider making it), and the Starbucks involvement in the Betacup challenge to eliminate paper cup consumption. Another model of crowdstorming involves open-innovation platforms which focus on social activism through design (e.g. OpenIDEO, Design21, DESIS Network). These collaborative platforms challenge designers to develop solutions to societal and environmental problems for the collective social good.

5 CONCERNS AND IMPLICATIONS

Traditionally new products emerge from a quality controlled process where design and engineering ‘experts’ collaborate to resolve a product for usability, safety, adherence to standards, and for manufacture. Many in the design community are concerned by the potential for speculative open design work to be superficial and poorly considered and for consumer-adapted design to be unresolved and lacking appropriate professional rigor. This could result in poor quality or unsafe products, combined with a lack of accountability and unclear liability responsibility. Who is responsible for a product failure causing injury or death, when the product is downloaded, modified and produced by the consumer from an open-source design platform?

We also need to understand the potentially disruptive impact of open collaborative design and co-creation on the established design industry. Whilst these new methods of engagement are highly motivating for design entrepreneurship especially in the hands of a new design generation, does collaborative design devalue the contribution of professional designers? What will be the economic impact on the creative industries of peer-to-peer product development outside traditional business models? Is this a paradigm shift that will require a complete reformation of the design industry?

How do we handle intellectual property? Competitive advantage has always been protected by patents and design registrations, but open design platforms provide opportunities for endless adaptation and plagiarism of designs in a spirit of collaboration that is highly disruptive to existing business practices. There are huge opportunities for a renaissance or regeneration of industrial design, but new product development processes must adapt to different and constantly evolving consumer interaction.

6 EDUCATIONAL IMPLICATIONS

How do we prepare design students for these new work practices? Although traditional design skills and expertise are still relevant, are they enough? As leaders in any product development process, designers will always need specific 'design' expertise especially as their collaborators may well be novices. However graduates will need to also be entrepreneurial, independent and collaborative and have a greater understanding of consumer behaviour and the potential of social interaction. Social technologies whilst disruptive for established business models, are potentially liberating for designers and may herald a new design entrepreneurship, driving product innovation towards more consumer focused and relevant product outcomes, with significant consumer/community engagement. The issue is whether existing design curricula adequately prepares students for entrepreneurship design practice, and the consumer engaged, co-creation models, which will characterise 21st Century design practice.

As educators, we have an obligation to ensure that design graduates are capable of delivering an effective product implementation strategy that exploits the potential of social technologies, rather than merely responding to a brief. Students must be taught to facilitate flexible, consumer-designer-product interactions where consumers are engaged and empowered throughout the new product development process. Accordingly, design curricula must respond to emerging social media opportunities and product implementation strategies, ensuring new modes of consumerism and product languages are enabled without compromising quality, usability, user safety or satisfaction. These are new challenges.

REFERENCES

- [1] Hagen, P. and Robertson, T., Dissolving boundaries: social technologies and participation in design. *OZCHI '09 Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7*, pp129-136 Melbourne, 2009).
- [2] de Vere, I., Industrial Design 2.0: A Renaissance. *E&PDE13: The 15th International Conference on Engineering and Product Design Education*, Dublin, Ireland, 2013).
- [3] Jenkins, H., *Convergence culture: Where new and old media collide*. (NYU Press, 2006).
- [4] Benkler, Y., *The wealth of networks: how social production transforms markets and freedom*. (Yale University Press, New Haven, 2006).
- [5] Toffler, A., *The Third Wave*. (William Morrow, 1980).
- [6] Ritzer, G. and Jurgenson, N., Production, Consumption, Prosumption: The nature of capitalism in the age of the digital' prosumer'. *Journal of Consumer Culture*, 2010, 10(13), pp13-36.
- [7] Kotler, P., The Prosumer Movement: A New Challenge for Marketers. *Advances in Consumer Research*, 1986, 13, pp510-513.
- [8] Bruns, A., Towards Produsage: Futures for User-Led Content Production. In *Cultural Attitudes towards Communication and Technology*. Tartu, Estonia. pp275-284
- [9] Pine, B.J., *Mass Customization: The New Frontier in Business Competition*. (Harvard Business School, Boston, 1992).
- [10] Anderson, C., The Long Tail: Why the Future of Business is Selling Less of More. *Wired*, 2004, 2(10).
- [11] Hoyer, W.D., Chandy, R., Dorotic, M., Krafft, M. and Singh, S., Consumer Cocreation in New Product Development. *Journal of Service Research*, 2010, 13(3).
- [12] van Doorn, J., Lemon, K.N., Mittal, V., Nab, S., Pick, D., Pirner, P. and Verhoef, P., Customer Engagement Behaviour: Theoretical Foundations and Research Directions. *Journal of Service Research*, 2010, 13(3), pp253-266.
- [13] Nakki, P. and Virtanen, T., Utilising social media tools in user-centred design. *The CHI 2007 Workshop. Supporting non-professional users in the new media landscape*. San José, 2007).
- [14] Kaplan, A.M., Users of the World, Unite! The challenges and opportunities of social media. *Business Horizons*, 2010, 53, pp59-68.
- [15] Dittrich, Y., Eriksén, S. and Hansson, C., PD in the Wild; Evolving practices of Design in Use. *PDC 2002 Proceedings of the Participatory Design Conference* Malmö, Sweden, 2002).
- [16] Hagen, P. and Robertson, T., Social technologies: challenges and opportunities for participation. *Proceedings of the 11th Biennial Participatory Design Conference* (ACM, Sydney, 2010).
- [17] Droog. Design for Download [online]. 2011. Available from: <http://studio.droog.com/projects/events/design-for-download/>
- [18] Rogers, E.M., *Diffusion of innovations (5th ed.)*. (Free Press, New York, 2003).