LAUNCHING TO LEARN
IN-MARKET PROTOTYPING AS USER RESEARCH

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1. SUMMARY

This paper will begin by tracing several trends in society, business practices and technology that have, the author argues, altered the product-development process in many cases to the extent that the "product development cycle" is an obsolete way of discussing the process as currently practiced. This development has the potential to alter the dynamic of the last few decades, which have been characterized by increasing compression of the time available for design and the research informing it.

The paper then presents several recent case studies of students and young professional designers building products for use and selling them at small scale, intended as a research process in the concurrent design of those products. If current trends are recognized and exploited, the paper argues, a product development environment characterized by concurrent design and sale of products can result in a stronger role for design in the process.

2. SOFTWARE AND ID CONVERGE

It's a well-tested axiom in industrial design and allied fields that the product-development cycle is always shortening. This squeezes all phases of the process, but industrial design is disproportionately affected, leaving less time for the vital "front-end" activities of user-based research and insight that make valuable innovation possible and make product development worth doing in the first place. (Cagan and Vogel, P. 130). While a shorter development cycle offers many benefits (better responsiveness to changing user needs, for one), industrial designers have tended to see themselves as victims of this process, primarily because at one time the other parts of the process benefited disproportionately from time-saving and productivity enhancing technologies such as rapid prototyping and computer-aided design, whereas the value-generating activities at the front end of an industrial design process rely on interpersonal activities that are very difficult to time-compress, such as observational research, iterative prototyping and interviews.

Now, however, the situation has changed again. Three trends are converging to redefine how the product development process is understood in general and how designers understand their role in that process, and potentially to free designers from the tyranny of the traditional development cycle.

The first trend began in the software industry, culminating in 2001 with the release of the Agile Software Development Manifesto (agilemanifesto.org). Responding to insupportable pressures on their own design process, in a notoriously time-pressured industry, software coders rebelled against the formal, siloed, highly managed strictures of traditional software development, replacing it with a process that was productive and disciplined, but based on iteration, prototyping, collaboration and continuous improvement. The new processes created in this effort, generally grouped under the category "agile development methodologies," got results. They weren't just efficient- the resulting software was better, less buggy, and more responsive to customer needs, as well.(Blank, HBR)

At the same time as Silicon Valley software companies adopted "agile" methodologies, venture capital investment became increasingly focused on software, because the potential returns were huge, while the investment was

low. This infused the app-development community with cash, but it also allowed software-development ideas to diffuse into the wider world of entrepreneurship and new business ventures, through influential figures technology-business figures such as Steve Blank. (steveblank.com)

Design, of course, had been using similar methodologies for decades- but there was a reason why product design hadn't immediately followed software design methods past the "front end" of the process: Agile development was about "continuous release"; successively larger groups of real users and potential customers used the programs, and contributed feedback on how they could be improved. The process replied on the easy, cheap replicability of software products. Physical products, however, needed to be "launched" in order to reach the market. Under the mass-media conditions that obtained in the late twentieth century, a launch was a big deal, involving major investments in staff, marketing, packaging, tooling, manufacturing and distribution. A launch had to go right the first time; "failing early and often" was not an option.

3.   THE END OF THE BIG LAUNCH

As Roger Ball recounts in his book "Design Direct," (Ball, p 4)the tyranny of the launch started to fade in the 1980s. It happened the same way Hemingway described bankruptcy: "Two ways. First gradually. Then suddenly." (Hemingway, ch.13 pa. 31). New technologies arrived. Widely available CAD/CAM and 3D printing, third-party logistics, and fast global manufacturing with low order quantities became widespread. These combined synergistically with internet-enabled commerce platforms like Etsy and Kickstarter, which allowed small-scale product rollouts without recourse to banks, or dilution of equity through venture capital investment. Finally, social media arrived on the scene, allowing potential users to communicate directly with designers to connect with, affect and even propose new products before they hit the shelves. These changes have happened so fast that many in the design and product development communities are still operating according to the previous paradigms, because their business models haven't yet been affected of disrupted by new ways of operating.

As Ball relates in his book (Ball, p 36), it took a while for professional designers to notice these snowballing changes and to understand their relevance to the process they were engaged in. Because design education tends to take its cues from cutting-edge practices in industry, it could be expected that it would take even longer for these new methods for product development, which have come to be bundled under the name "in-market prototyping", to be integrated into design curricula. Recent observations, however, indicate that this "industry-first" model may be changing, replaced by one in which grass-roots communities of designers and product users propose innovations first, and challenge large-scale industry to catch up.

Today's design students are "digital natives." Their generation never knew a time without the Internet, and they grew up with, and in many cases embedded in, social media. In place of the mass culture driving the twentieth century, they can be deeply involved in niche cultures, while retaining wide understanding. As this paper will demonstrate, in many cases this generation is now driving design's move toward "learning by launching", because it seems natural and obvious to them, rather than because it's been overtly demonstrated or imposed. Their success, in turn, is quickly moving in-market prototyping into industry- through the back door, as it were.

4.   ALEC

Alec is a 26-year-old design student and randonneur. Randonneuring, for those not familiar with the sport, is self-sufficient, long-distance team bicycling. The sport has a strong culture that sees itself as based in camaraderie, rather than competition. (rusa.org) After working at bicycle-accessory companies for a few years, Alec went to ID graduate school to launch a career in product design. Soon, his instructors noticed a pattern: Along with whatever medical, housewares or consumer-electronics product he was working on for school, he was always developing a bicycle product as well. Mudflaps, cargo racks, brake bosses, light mounts, entire brazed-steel bike frames: it was all being designed, manufactured in small runs or fabricated on a custom basis, sold, and continually redesigned. One man seemed to be making many extremely sophisticated decisions on his own. In fact, however, a few well placed questions revealed that, in the close-knit randonneuring community, Alec was the center of a thriving

virtual product-development community that had grown organically. He had no need for observational research or focus groups, because people were continually coming to him on Twitter to propose new ideas or issues, which were then vetted and discussed by an experienced group of riders. Once something looked compelling enough to be a product, Alec quickly built a prototype, then put together buying groups and orders for the finished work. Foamcore prototypes went out to enthusiasts and clients for sizing and evaluation; these trials were discussed as though they were entertainment events. Those who bought from Alec gave him feedback, in public; others commented on proposed revisions before buying in themselves.

In its emphasis on soliciting product ideas online, it was much like the Web 2.0-based product development firm Quirky, but with more specialist expertise and less expensive infrastructure and overhead.

In conversations with instructors, Alec commented how, in contrast, it seemed that his academic design work was being done in an informational vacuum. He and the faculty became aware of what a powerful tool he had, and made plans to exploit it for Alec's graduate thesis project. Currently, Alec is using several bicycling communities to help him design a new dynamo-powered bike lighting system. His online group has let him find insights he never would have as an individual designer, weighing in on everything from the need for a customizable metal case, to the length of time needed for capacitor backup power at stoplights, to specific parts specifications for the LED driver circuitry.
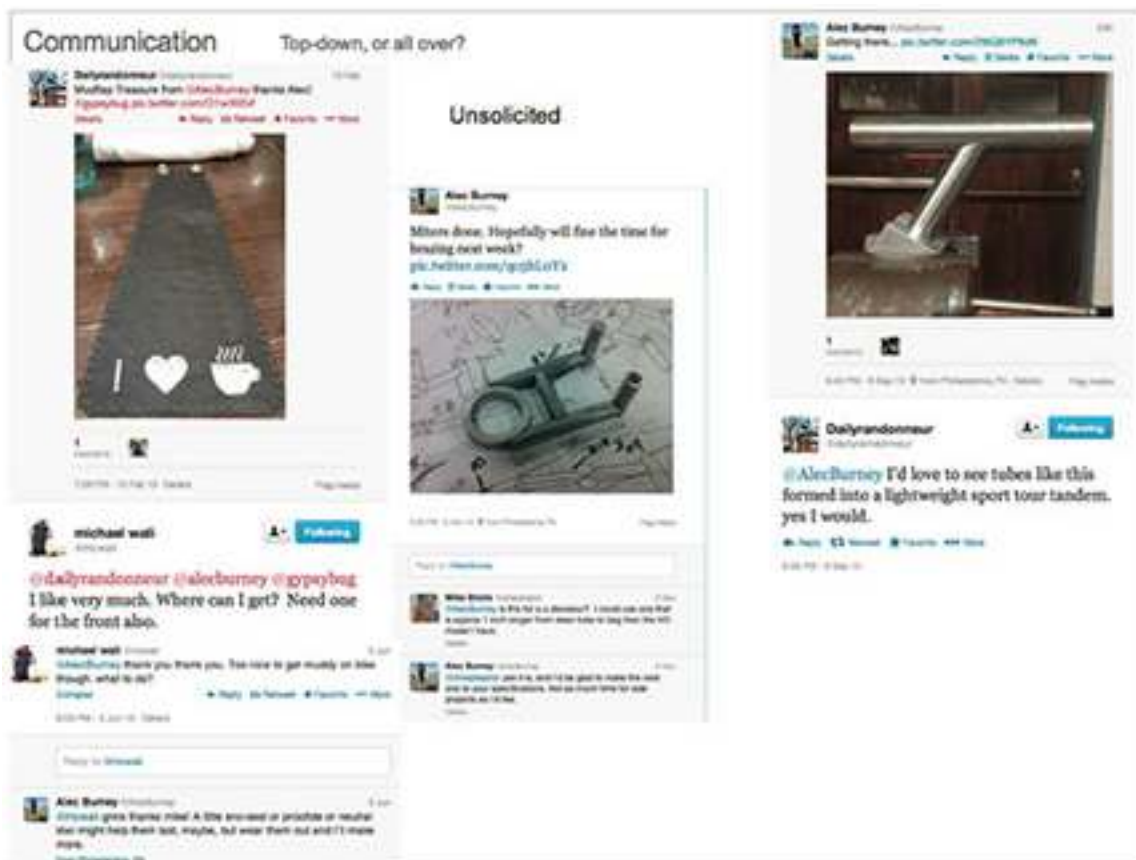

Figure 1. Alec used Twitter as a venue for product development.

5. SETH

Seth is 25. He has an undergraduate degree in mechanical engineering, and worked for a Rivian, a startup automobile company. His time there convinced him that the designers were having all the fun, which prompted his return to school. For some time, he's been interested in open-source, community-moderated hardware tools for making things- efforts like ShapeOko (http://www.shapeoko.com/) and the Prusa/RepRap fused-deposition printer (http://reprap.org/wiki/Prusa_i3).

For his graduate thesis project, Seth was interested in exploring the idea of customization and customer participation in the design of products mediated by online tools. As way of finding out what it was that product users really valued when offered the opportunity to customize or alter the design of products they bought, Seth began conventionally by gathering existing examples of such systems and evaluating them. He went on, however, by developing small customized products which he could offer, make on his own using CNC machining, and sell through an Etsy storefront.
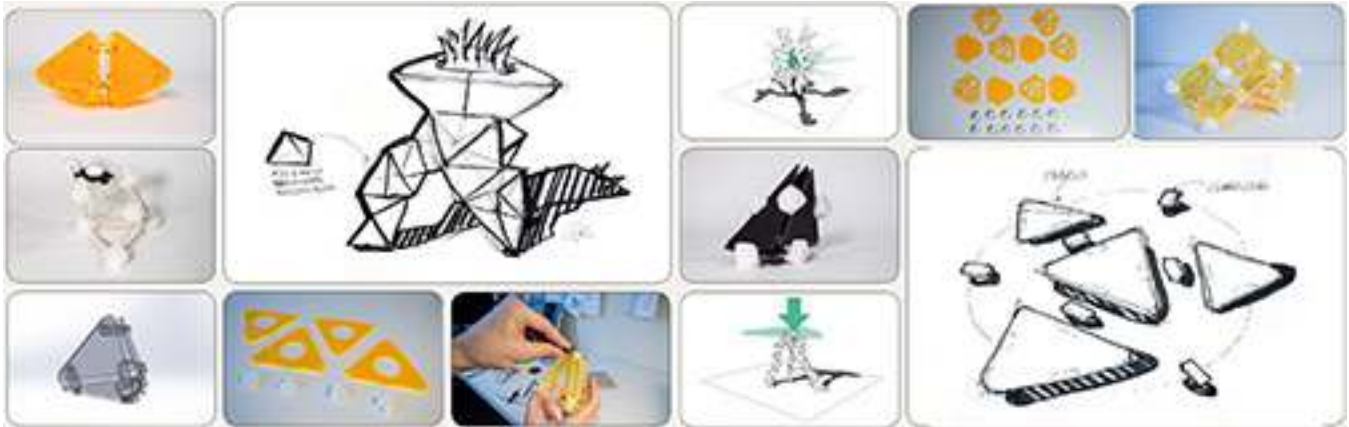

Figure 2: Seth prototyped products and sold them to understand how to integrate user customization

This experience let him understand the crucial balance between the high level of flexibility he needed to build into his system for product creation, and the simplicity of concept and interaction the system needed to maintain in order to be comprehensible and compelling. As he continued to develop his project, he's received continuous feedback through comments on his posted design experiments on his blog. The final project is a system for "growing" furniture in software, then allowing users to purchase finished designs and have them delivered, either fully assembled or as kits. in addition to making use of in market prototyping and public feedback on the design progress, the design software itself makes use of many open source components by others, which have themselves been improved through Seth's participation in their development and implementation.
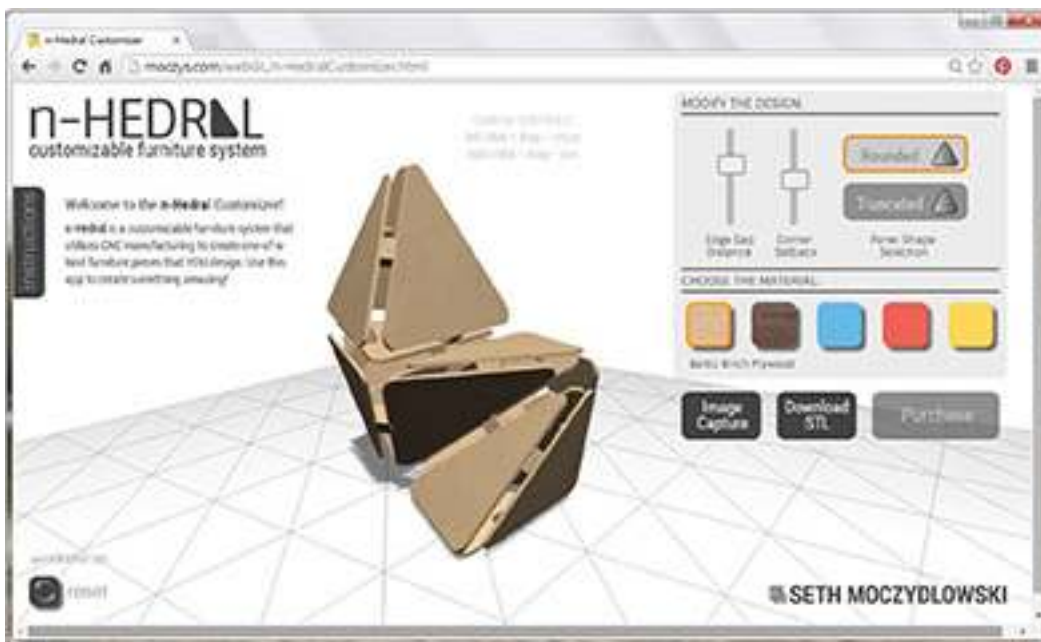

Figure 3. Final furniture creation interface, built with open-source tools

Figure 4. Parametrically-generated furniture prototype

6. AAKRITI

Aakriti is a graduate student, working during school in an industrial design internship at a major appliance manufacturer (name redacted due to issues of confidentiality and company policy). She and her fellow young designers are used to a culture of sharing and quick feedback. In frequent conversations with graduate design faculty via Skype, Aakriti reported that these younger designers often felt frustrated by the lack of immediacy, transparency, and credibility in the feedback that they were getting from others within the corporate hierarchy on their designs. How did Marketing know customers "were interested in a cylinder" when buying a clothes washer? Had they actually talked to customers, or were they extrapolating? While skepticism with corporate priorities, opinions, and design direction has been characteristic of industrial designers as long as there have been corporate design departments, Aakriti and her peers felt empowered to do something about it, because they knew they had independent sources of credible information. When tasked with developing a line of small houseware products to accompany a group of appliances, they proposed to validate customer interest in the collection by launching them and attempting to fund them as a crowdsourced project on Kickstarter. Interestingly, the corporate hierarchy was not immediately dismissive of the idea; their primary objection was the idea that a bad design- signaled by a potentially unfunded Kickstarter campaign- could be seen by the public as a failure and attributed to the appliance brand. However, the corporation had also heard that its competitors were using similar

strategies to gain design and market insight, and didn't want to miss out. At the internship's end, the company was looking at various ways to achieve "plausible deniability," to crowdsource feedback on products, while being able to disavow its association with those products if necessary.

7. CONCLUSION

As the foregoing examples show, in-market prototyping would seem to have a lot to offer design processes, both in terms of efficiency, and in terms of getting better insights into the value gained by users from designs and design revisions. Experience with graduate thesis products shows that projects that incorporate in-market prototyping and concurrent feedback processes are both better informed about the impact of design decisions, and more able to iterate and adapt to unanticipated user needs. In fact, in several cases, the student designer has begun to participate in processes of co-creation (Zwass) in which they are directing and editing a design effort in which they also participate, rather than being the sole "authors" of the design. While an older generation of designers, more accustomed to the idea of the designer as lone creator, may need to console themselves with the better user feedback they gain from this process, designers of the millennial "digital native" generation seem already to be quite comfortable with co-creation and believe it to be an obvious strategy in a connected society.

It remains to be seen how long it will take major corporations and other drivers of professional design activity to adopt these practices, but, as Aakriti's example reveals, corporate use of in-market prototyping may begin- in fact, may already be happening- as a surreptitious effort, because of concerns about loss of control, about its effect on branding or on existing organizational structures.   As social media and the idea of continuous feedback from a customer/user base become more familiar concepts to corporate product managers, however, one can imagine a time in the near future when these processes will be widely accepted, and in fact, expected as a baseline business practice by customers.

REFERENCES

Cagan, J., Vogel. C. (2013) *Creating Breakthrough Products: Innovation from Product Planning to Program Approval, 2nd Edition*. Upper Saddle River, NJ: FT Press.

http://www.agilemanifesto.org, accessed March 14, 2014

Blank, Steven G. "Why the Lean Start-Up Changes Everything," Harvard Business Review, Cambridge MA, May 1, 2013.

http://steveblank.com/2012/05/21/why-facebook-is-killing-silicon-valley/, accessed April 2, 2014

Ball, R. with Overhill, H. (2012) *Design Direct: How to Start Your Own Micro Brand*. Hong Kong Polytechnic University Press, Hong Kong.

Hemingway, Ernest (reprint 2002) *The Sun Also Rises*. Scribner, New York.

http://www.rusa.org/, accessed April 16, 2014.

(Zwass, V. (Fall 2010). "Co-Creation: Toward a Taxonomy and an Integrated Research Perspective". *International Journal of Electronic Commerce*. pp. 11–48.)