



The Future of Making for Designers, Makers, and Users:
A Conversation Between Industry and Academia

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In recent years, the apparel industry has been integrating a number of emerging technologies. Methods such as automated production and 3D printing or additive manufacturing are shifting the dynamic for traditional apparel designers. Such evolution is leading to a shift in paradigm (Lipman & Kurman, 2013). Various industry companies such as Under Armour, are actively exploring and applying such emerging technology in commercial products and manufacturing processes. The Under Armour's Lighthouse, based in Baltimore, USA, is one of the prime examples of diverse technology integration at the both product development and manufacturing scale. As a result, companies as such are seeking new skillsets and knowledge base in modern design talents. At the same time, technology has driven rapid change in traditional makers groups, such as mechanical, electrical, and computer engineers. The traditional way of developing product using the maker's approach is now requiring more understanding in diverse tools, product conceptual design as well as versatility in learning and working with relevant fields (Hatch, 2013). From another perspective, technology users including retailers, supply chain managers, and consumers are consequently facing drastic changes in the process of technology adoption. The digital platforms surfaced from the technologies are providing both industry alternative business models and consumers more ways to interact with brands and product designs processes (Amen et al., 2017). The change in technology applications and explorations has led various industry and academic stakeholders to explore future possibilities and advancements. However, disconnect currently exists between the two sides in gaining well-rounded understanding, best approach, and practice in such paradigm shift. More importantly, communication is limited in ways to efficiently integrating emerging technology in related educational curriculums and appropriately prepare/secure future talents in the near future. The aim of this study is to examine perception of both industry and academia in the changing environment for designers, makers, and users. The goal is also explore guidelines and approaches in locating resources for supporting both industry and academia in future growth.

Focus group study was conducted as part of a national symposium development at a US public university. Industry professionals from leading companies or representing key technologies in apparel industry were purposely recruited to the study in a 3-hour semi-structure roundtable discussion. Based on professional background and experiences, participants were separated into three discussion groups: 1) designers, including product designer/developer, CAD technician, etc., 2) makers, including software engineer, technology developer, robot engineer, etc. and 3) users, including retailer, supply chain manager, buyer, promoter, consumer, etc. Each group consisted of six to seven participants, with average three to four representing industry and two to

three representing academia. All groups discussed topics regarding designers, makers, and users and exchanged ideas periodically for further feedback. Data was collected using audio recording and was analyzed based on theme codes.

The data indicates the following key themes for designers, makers, and users groups. First, considering the novel technology integrations, the changing role and environment for designers suggest that designers in the future will be a ringleader that becomes jack of all trades but master of none so that one can integrate knowledge from fields such as engineering. Also, designers will be challenged with seeking the most efficient workflow in adapting to new materials, methods and post-processing procedures. New knowledge and skills sets for future designers also include the more well-rounded understanding of new manufacturing processes as well as the ability to reinvent product to meet not only consumer but also company budget needs. Second, the data indicates that future makers will in many ways become the educator in working with designers of diverse fields in collaborative relationships. At the same time, the makers will also serve as some of the key consumers in the digital age as they would be interested more in customized and interactive products design process and services. The makers will be challenged with not only new computer-aided design skill sets but also the consideration of production volume, yield and the speed to market, and various new business models. Third, future users who are retailer, buyers, and supply chain managers will be expecting more customized products and more intimate interaction between consumer and designers. The users will be challenged with reconfiguring the traditional manufacturing flow for efficiency and flexibility as well as marketing unique products through new business models and service approaches. From the user as consumer perspective, this group would be expected to take on more roles of merchandiser and designers in the new ways.

Overall, the research results suggest that the roles of designer, maker, and user are quickly shifting in the age of novel technology. Currently, industry lack understanding of academia needs from both education and research perspective. Much disconnect still exists among groups of designers, makers and users in realizing the best mechanism in transitioning to the new ways. One of the major challenges found was the cost for both industry and academia stakeholders in efficiently implementing various technologies. However, the disruptive changes are quickly arriving, and future industry and academia will be challenged with lack of talents and the best approaches in refining existing curriculum and establishing resources. Aspects such as federal and industry funding as well as co-op programs for students should be considered for the future.

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