Designers as innovators

The role and practice of a designer in driving innovation

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A thesis submitted in partial fulfillment of the requirements

for the degree of Master of Design

in Industrial Design

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Dedicated to my grandmother 劉靜嬌, who loves me and raised me. Her masterful cooking skills instilled in me a sense of perfection in everything I do, her generosity set an example for me to give generously and her humility gave me strength to be true to myself.

Abstract.

The recent success of design-driven companies has generated much inquiry into the question of what is design thinking because many companies have begun to realize how design thinking affects their competitiveness. However, these companies do not understand the so-called design-driven process, and therefore it is harder for them to implement a successful outcome. My desire to be an active member of the design community and discourse started a three-year-long investigation into understanding the designer's role and practice in driving innovation. My investigation into past design practitioners has shown that a succession of design thinking was the result of an evolution of thoughts and writings from various influential thinkers, beginning with the Industrial Revolution. The literature reviews I studied revealed a set of frameworks that created an environment with the right conditions to foster good ideas. I further determined how these good ideas had the best chance to succeed and how the working relationship between the interpreters was developed. I then reviewed concepts and studies from sociology in order to understand the factors and traits that influenced those interpreters. I formulated and presented a practice with a design project as the thesis case study. I have tested the design and presented the results.

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Acknowledgment

I would like to thank my Heavenly Father who made everything possible and spoiled me with this once in a lifetime chance to have this much fun in this Master in Design thesis.

I would like to thank my parents, for their love and sacrifices, and being supportive in everything I do.

I would like to thank Tim Antoniuk for his continual guidance as my supervisor and as a friend.

I would like to thank Robert Lederer for reading through my initial drafts, which were horrible and gave me valuable insights on how to make them less horrible.

I would like to thank Greig Rasmussen for giving me advice on my entrance portfolio. He opened the door and let me in when I was a stranger to design.

I would like to thank Cezary Gajewski for welcoming and encouraging an engineer to study design.

I would like to thank Ken Horne for letting me tap into his encyclopedic knowledge on how to make things.

Last but not least, I would like to thank all those who I had the privilege to meet, conversed with or worked with in the past 3 years. You all have helped to shape my journey in design.

The Research Question

> "As a young and very dynamic profession, design has come a long way from its 'artsy' roots to become a problem-solving discipline requiring conceptual vision and competent implementation."[1]
>
> — Hartmut Esslinger, founder of frog design

To most, the term design is synonymous with aesthetic, or in other words, a designer's job is to beautify things at the end of the creation process and do nothing more. Designers beautify only after engineers, who understand how things work and are able to make things work, have made things functional. Business and marketing people, who make the investment decisions and are responsible for coming up with new and innovative ideas, are in control of the process. This process is usually supported by well-established and standardized formulations of perception-altering advertisements and packaging, which are then released to the public for consumption. Such methodologies are currently driving the majority of the businesses in our global economy even though they are made up of broken approaches that create many useless consumer goods. Consumers quickly throw out these goods, which are often non-decomposable and toxic, taking centuries to break down. These atrocities plague our environment every single day. However, these design processes are becoming less effective as consumers are becoming more concerned about the environment and being socially responsible. The rising standard of living around the globe has also caused a new trend in consumer behaviour: consumers no longer only buy the cheapest goods, but rather consumers buy goods that are tied to their sense

[1] Esslinger, Hartmut. 2013. *Design Forward: Creative Strategies for Sustainable Change*. Stuttgart: Arnoldsche Verlagsanstalt, 290.

of identity.[2] Therefore, a new wave of design-oriented thinking is transforming how business decisions and products are made. The companies that grasp this new design-oriented thinking have enormous success, and the companies that do not are quickly losing market share and some even face bankruptcy or being bought out.[3] At the time of writing, Apple's revenue is $170.9 billion and, of that, $37 billion is net income. Its operating system has 15.6% of the market share and its iPad tablet has 74% of the market share. Its stock price is at $120 per share, and five years ago it was $27.[4] As my case study for an innovation and design story, Apple understands and has mastered design-driven methodologies and has used them to strengthen their competitive advantage. Its lucrative success demands an answer to the question of what and how Apple is doing that is different and, more importantly, what a designer has to do in that process. Thus, this thesis will answer the research question:

What is a designer's role and practice in driving innovation?

[2] Livingstone, Sonia M., and Peter K. Lunt. 1992. Mass Consumption and Personal Identity: Everyday economic experience. Philadelphia: Open University Press.

[3] Olson, Parmy. 2014. BlackBerry's Famous Last Words At 2007 iPhone Launch: 'We'll Be Fine'. http://www.forbes.com/sites/parmyolson/2015/05/26/blackberry-iphone-book/ (accessed June 10, 2015)

[4] Statista: The Statistics Portal. 2015. Facts and statistics on Apple. http://www.statista.com/topics/847/apple/ (accessed October 29, 2015)

Background to the Study

Many different fields discuss the topic of innovation, and design, engineering, and business all have been active participants in the discourse. Business often takes a retrospective approach to analyze the factors and trends that enable innovations to happen, as it hopes to reapply that knowledge to mimic earlier success. Engineering focuses on discovering and driving breakthroughs in technology in the hope of using these technologies to do things differently. Design looks through a sociocultural lens and pays attention to how people's perceptions of meaning have been shaped and changed, and it looks at what is the best arrangement to allow for the best human experience.

Different myths plague the general public's understanding of utilizing design. Among the most popular is the idea of an egotistical genius designer that has eureka moments in order to come up with the best and most brilliant solution. And more recently, participatory design draws in expertise and talents from different fields to collaborate on a joint-creation method. Prominent firms, such as IDEO, claim to have figured out the design process as a methodology.[5] However, from my own experience, not one of the above methodologies guarantees success because the application of the design process is an art more than a science.

Having practiced design in both the engineering and design communities, my experience has been unsatisfying with only an occasional celebrated success. I am dissatisfied because I do not understand how I can achieve a successful outcome sometimes and how other times I am unable to. Over the years, I have become better at achieving success, and I have developed an intuition to know that certain projects will not be as successful because they lack certain

[5] Tischler, Linda. 2009. IDEO's David Kelley on 'Design thinking'. http://www.fastcompany.com/1139331/ideos-david-kelley-design-thinking (accessed December 15, 2015)

factors unrelated to their capability or methods. My discontent and the potential reward and power of understanding have motivated me to begin a journey of inquiry in the field of design. In the hope of finding out what design is, I enrolled in a master's program in Industrial Design but instead found out that the most asked question in design school is "What is design?"

Literature Review

When Roberto Verganti, a business management expert and the author of *Design-Driven Innovation*, wanted to understand design, he asked Ezio Manzini, a respected design theorist and colleague at the Faculty of Design of Politecnico di Milano, for help to understand the definition of design. Manzini suggested that he read a book on the history of design. Verganti commented:

> Although that may seem like odd advice to give a management scholar — after all, business schools seldom study the history of management — it was very wise, because it encouraged me to avoid the short cut of simple answers and allowed me to grasp the multifaceted nature of design.[6]

A Chinese emperor in the Tang dynasty once said "using copper as mirror, one can make proper one's attire; use history as mirror, one can understand the reasons for the rise and fall of nations; use people as mirror, one can understand advantages and disadvantages of actions in circumstances."[7] Certainly, to understand design, knowing its history is very important. According to the Tang dynasty emperor, one can know the reasons for the rise and fall of design if one studies it, particularly what design successes and failures have been tried and how the influence of design can be maximized in the future.

While this thesis is not an attempt to be an encyclopedic collection of design history, I hope to highlight the important events, people, and thinking behind them—specifically in regards to industrial design and its relationship with modern manufacturing and its business situation—in

[6] Verganti, Roberto. 2009. *Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean*. Boston: Harvard Business Press.
[7] Xu, Liu. 945 AD. *Old Book of Tang*.

order to understand the advantages and disadvantages of what was done before and to plan for a better future. And, from the lives of these pioneering practitioners, I hope to find answers to the question of what is the role and practice of a designer. In this chapter of design history exploration, we shall see the evolution of design practice and thinking that a serial of connected design thinkers carried forward to further explore the succession of design thinking that led us to our current one. The design history exploration portion of my thesis will be largely based on David Raizman's book on design history, *History of Modern Design*.

In his book, Raizman aptly titled Part III as "Arts, Crafts, and Machines — Industrialization: Hopes and Fears [1866-1914]." This period between 1800 and 1900 is during the Industrial Revolution when the steam engine and machinery assisted in the production method, allowing goods to be produced much faster and at a higher volume. As a result, there was significant economic growth and everybody saw a great potential for machines. However, the traditional method of production, mainly in the arts and crafts industries, faced great challenges and seemed irrelevant and obsolete because it lacked efficiencies and had higher costs in comparison to industrialized production. Along with the potential that industrialized production brought were the fears that machines would take over jobs done by humans, and people feared the craftsman spirit that is instilled within the arts and crafts would disappear.

John Ruskin (1819-1900)

The narrative of Part III in Raizman's book begins with the English writer and art critic John Ruskin. John Ruskin was born in 1819, during the Industrial Revolution, with the two contrasting production methods affecting the daily lives of people and the social atmosphere. Ruskin deplored industrialization and the machine because machines made work easy or just plain dull,

and because they made things uniform and lacking in the individuality that their handmade counterparts possessed:

> All the stamped metals, and artificial stones, and imitation woods and bronzes, over the invention of which we hear daily exultation — all the short, and cheap, and easy ways of doing that whole difficulty is its honour — are just so many new obstacles in our already encumbered road. They will not make one of us happier or wiser — they will extend neither the pride of judgment nor the privilege of enjoyment. They will only make us shallower in our understandings, colder in our hearts, and feebler in our wits.[8]

Rather than applauding the economic expansion and material progress of his own time, he blamed industrialization and materialism for helping to create poverty, inequality, and misery, and saw the restoration of meaningful work as a means to alleviate them: "the foundations of society were never yet shaken as they are at this day. It is not that men are ill-fed, but that they have no pleasure in the work by which they make their bread, and therefore look to wealth as the only means of pleasure."[9] For Ruskin it wasn't taste or style that governed his attitudes, rather it was joy:

> the right question to ask, respecting all ornament, is simply this: Was it done with enjoyment — was the carver happy while he was about it? It may be the hardest work possible, and the harder because so much pleasure was taken in it: but it must have been happy too, or it will not be living.[10]

Ruskin admired the crafts of the Middle Ages and saw the decorative arts as a vehicle for enlightenment, and he saw the industrial production method as the nemesis of his time. Ruskin did not see industrial production as contributing to the unification of art, craft, social, and political reform. Nonetheless, he was an influential critic and thinker that connected the issue of

[8] Raizman, David. 2010. *History of Modern Design (2nd Edition)*. New York: Pearson.
[9] Ibid, 82.
[10] Ibid, 82.

the production of goods and economics with the social well-being of a society. Ruskin's writing influenced many art and design practitioners of his time and beyond, such as William Morris.

William Morris (1834-1896)

William Morris and John Ruskin both lived during the Victorian age of England and went to Oxford University. Morris admired Ruskin's writing, and it influenced his thinking and writing in a major way. Morris' admiration of Ruskin's writing was evident as Morris produced an illustrated edition of Ruskin's "Nature of Gothic" chapter from *The Stones of Venice*, in which Ruskin upholds his idea of a close relationship between a man's thinking and his act of working in the society:

> We want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen, in the best sense. As it is, we make both ungentle, the one envying, the other despising, his brother; and the mass of society is made up of morbid thinkers and miserable workers. Now it is only by labour that thought can be made healthy, and only by thought that labour can be made happy, and the two cannot be separated with impunity.[11]

Morris's writing echoed Ruskin's when he wrote, "it is not desirable to divide the labour between the artist and what is technically called the designer, and I think it desirable on the whole that the artist and designer should practically be one."[12] And we can see the way Ruskin's writing influenced Morris from the introduction to "Nature of Gothic" where Morris writes:

> For the lesson which Ruskin here teaches us is that art is the expression of man's pleasure in labour; that it is possible for man to rejoice in his work, for, strange as it may

[11] Ruskin, John, Edward Tyas Cook, Alexander Wedderburn. 2010. The Works of John Ruskin. Cambridge University Press. 201.
[12] Ibid, 84.

> seem to us to-day, there have been times when he did rejoice in it; and lastly, that unless man's work once again becomes a pleasure to him, the token of which change will be that beauty is once again a natural and necessary accompaniment of productive labour, all but the worthless must toil in pain, and therefore live in pain. So that the result of the thousands of years of man's effort on the earth must be general unhappiness and universal degradation; unhappiness and degradation, the conscious burden of which will grow in proportion to the growth of man's intelligence, knowledge, and power over material nature.[13]

Originally preparing for a career in the clergy while studying at Oxford, Morris had taken Ruskin's idea to unite art, craft, social, and political reform a step further by including a spiritual quality to his ideology. He held this attitude in deep regard, and it formed the basis for a number of organizations and other initiatives known as the Art and Crafts Movement. One of those initiatives is a publishing company by the name of Kelmscott Press, through which Morris published Ruskin's "Nature or Gothic."

Another initiative that Morris founded was a home decor and furnishing company, Morris & Co. Morris initially refused to use machines even to manufacture blocked wallpaper or printed fabrics, and consequently his products and services were only affordable to wealthy clients who shared the same ideal of a society based upon meaningful and satisfying work. These circumstances contradict his social belief, and he grew increasingly disillusioned by the inability of his efforts to effect broad social change and to reach his intended working-class audience. Morris' desire for equality in the society can be seen in his writing:

> what I mean by Socialism is a condition of society in which there should be neither rich nor poor, neither master nor master's man, neither idle nor overworked, neither brainslack brain workers, nor heartsick hand workers, in a word, in which all men would

[13] Ibid, 86.

be living in equality of condition, and would manage their affairs unwastefully, and with the full consciousness that harm to one would mean harm to all—the realisation at last of the meaning of the word COMMONWEALTH.[14]

The irony is that the success of Morris & Co. depended almost entirely upon an exclusive market, thus it supported the same capitalist system Morris hoped to eliminate. Morris eventually accepted mechanization in the production of his goods and furnishings, particularly if it reduced drudgery.

William Morris' ideas and influence were far-reaching. His influence was not limited to Britain, but spread to continental Europe and to the United States. Many people followed in his footsteps and founded similar initiatives and in even more elaborate forms. However some people transformed his views, such as Frank Lloyd Wright.

Frank Lloyd Wright (1867-1959)

Frank Lloyd Wright shared a number of Arts and Crafts principles; he tried to unify architecture, nature, and the elements of interior design and decoration to create a modern, democratic, and uniquely American version of the ideal home. For example, he published a design in mass-circulation magazines, including Edward W. Bok's *Ladies' Home Journal,* with the title: "A small house with lots of room in it" and a suggested cost of less than $6,000. However, a $6,000 home in 1901 would be affordable to a middle-class citizen rather than a working-class one today. In a lecture in 1901 delivered at Hull House in Chicago, Wright told his audience that the dream for democratic architecture could only be achieved by embracing the machine, which saved time and reduced drudgery. He stated that the machine's ability to produce simple products of high quality and noble beauty had been obscured only by the greed of

[14] Ibid, 85.

manufacturers and the ignorance of the public: “William Morris pleaded well for simplicity at the basis of all the art. Let us understand the significance to art of that word—SIMPLICITY—for it is vital to the art of the machine!” Indeed the invocation of William Morris recalls the British designer’s own comments, “the more mechanical the process, the less direct should the imitation of natural forms.” [15]

Wright’s courage to challenge the influential writing of Morris and his outspoken comments in defence of the machine and its possible role in creating social benefits in improving the lives of a broader public instilled a different perspective and suggested a possibility that machines were crucial to the development of humanity. One of the people that Wright left an impression on was Victor Papanek. In his book *Design for the Real World*, he recalled Wright saying: “the machine is here to stay” and that the designer should “use this normal tool of civilization to best advantage instead of prostituting it as he has hitherto done in reproducing with murderous ubiquity forms born of other times and other conditions which it can only serve to destroy.”[16]

Wright was a strong advocate for the role of machines in democratizing the living standard, and he strongly believed that designers have a social responsibility to create a better future for humankind.

Victor Papanek (1923-1998)

Victor Papanek was not only influenced by Frank Lloyd Wright’s writing and ideology, but he also studied at the architectural school that was run by Wright at Taliesin West in Arizona. A designer, architect, educator, and author, Papanek is best known by his once controversial and hugely influential book, *Design for the Real World.* His book caused him to be “derided, made

[15] Ibid, 100.
[16] Papanek, Victor. 2005. *Design for the Real World: Human Ecology and Social Change*. Chicago: Chicago Review Press, 30.

fun of, or savagely attacked"[17] by his fellow designers. Furthermore, he was forced to resign from the Industrial Designers Society of America (IDSA) in the United States, and the same society threatened to boycott an exhibition at the Centre Pompidou in Paris if his work was included. In 1999, IDSA posthumously honoured Papanek with its Personal Recognition Award for his 35 years of contributions to the design profession.[18] Papanek was a strong advocate of the socially and ecologically responsible design of products, tools, and community infrastructures. He disapproved of manufactured products that were unsafe, showy, maladapted, or essentially useless.

Papanek shared a similar view as Wright, as they saw the ethical use of technology and design as an opportunity for change in society and the environment. Papanek based his call for democratization of information and production on this interpretation, which lead to the development of his models for a participatory and open-source design practice, in which he expressed a denial of a top-down design process by rejecting design authorship. Papanek's conviction that professionals and laymen should be included equally in shaping the environment and that every human action should be considered as a creative effort can be understood as the guiding theme for this work. His thinking strongly echoes Ruskin's and Morris' ideas that a designer and thinker should be one.

Papanek's influence and the prominence of his legacy are exemplified in the creation of his estate, consisting of personal documents, artifacts, and archives, which are administered by the Victor J. Papanek Foundation with funds from the Austrian Federal Ministry for Science and Research and housed in the University for Applied Art in Vienna. The facilitators of the discovery, purchase, and setup of the foundation of Papanek's estate wrote a chapter on Papanek's life and deliberation of his writing and thinking in Hartmut Esslinger's book *Design*

[17] Ibid, XV.
[18] Industrial Designers Society of America. 2015. Victor Papanek. http://www.idsa.org/victor-papanek (accessed April 29, 2015)

Forward, from which the writing of this paragraph was mainly drawn. Esslinger was a professor at the University for Applied Arts in Vienna of the Master Class ID2, which was a position Papanek previously held, and he had helped in the creation of Papanek's estate foundation along with two of his former assistants who authored the chapter.

Hartmut Esslinger (1944-)

Hartmut Esslinger is the founder of the legendary design consulting firm, frog design (frog is an acronym for Federal Republic Of Germany, and is intentionally written in lowercase letters to rebel against the norm), whose clientele consist of prominent brands such as Sony, Louis Vuitton, Lufthansa, and Apple—the latter for which Esslinger is most famous. Esslinger is said to be responsible for the famous Snow White design language that Apple used in its early computers. He also claimed to have advised Steve Jobs to be a new kind of consumer-experience-driven company that Apple is known as today.

Esslinger's view is in line with Papanek in advocating the socially and ecologically responsible design of products, and he shared the same disapproval of manufactured products that were unsafe, showy, maladapted, or essentially useless.[19] In his book *A Fine Line*, he said, "All of those "cheap" goods that we've churned out have proven themselves to be much too expensive culturally, socially, and environmentally—in fact they're killing us."[20] Esslinger shared the same view as Papanek and Wright in the ethical use of technology and design as an opportunity for change in society and the environment. When he was invited to give a reboot to the Master Class ID2 at the University of Applied Arts in Vienna, he and his team said in the course mission manifesto:

[19] Wikipedia. Victor Papanek. http://en.wikipedia.org/wiki/Victor_Papanek (accessed April 27, 2015)

[20] Esslinger, Hartmut. 2009. *A Fine Line: How Design Strategies Are Shaping the Future of Business*. San Francisco: Jossey-Bass A Wiley Imprint. iBooks version.

> Designers have a social responsibility to connect and coordinate human needs and dreams with new opportunities in science, technology, and business, so that the results of their efforts are culturally relevant, economically productive, politically beneficial, and ecologically sustainable.[21]

Papanek rejected the idea of design authorship and is in denial of a top-down design process. He is convinced that professionals and laymen should be included equally in shaping the environment and that every human action should be considered as a creative effort, which can be understood as the guiding theme for his work. In a similar way, Esslinger also advocated an approach of co-design, however he affirms that design is an elitist profession: "Product design is and will remain an elitist profession. Simply put, real design quality never will be a matter of democracy."[22]

One of the reasons for his belief is that he thinks upbringing, environment, and education have a big influence on one's ability to design, and that these developments take time and for some the development curve was too far gone:

> "everybody can be creative," an idea with special appeal for non-creative people. In my opinion, that idea is a myth. The environment we are born into and grow up with obviously plays a major role in our creative development. Our family, teachers, friends, community, and country shape our appreciation for and approach to the creative process. As Craig Venter, who decoded the human genome, said, "We simply do not have enough genes for this idea of biological determinism to be right. The wonderful

[21] Esslinger, Hartmut. 2013. *Design Forward: Creative Strategies for Sustainable Change.* Stuttgart: Arnoldsche Verlagsanstalt, 206

[22] Esslinger, Hartmut. 2009. *A Fine Line: How Design Strategies Are Shaping the Future of Business.* San Francisco: Jossey-Bass A Wiley Imprint. iBooks version.

> diversity of the human species is not hard-wired in our genetic code. Our environments are critical!"[23]

Esslinger is a strong advocate of intertwining the economic and business aspects with design, as he stated in his goal of founding frog design, "When I founded my design firm, my goals were simple, yet powerful: to refine design as a strategic profession, and to continually promote its relevance to industry and business."[24]

Esslinger's notion was not to reinforce the importance of design in business or vice versa, but to suggest that the two aspects are equally important and essentially need to be borderless in order to achieve true success: "In my experience, true success comes for the designer and the business executive when the two can bridge the artificial lines that too often have separated their worlds."[25]

And furthermore, Esslinger's writing echoes William Morris, as he suggests designers have a cultural responsibility as well as a spiritual one:

> To succeed as competent and respected executive partners in the rational world of business, designers must become creative entrepreneurs and executives themselves.
>
> Ultimately, Designer must rise above all commercial functional benchmarks and aspire to near-eternal cultural relevance and spirituality.[26]

This school of thought that Esslinger believes in and advocates for is adopted or shared by many influential companies today, including Coca-Cola, Nike, IDEO, FuseProject, and Apple. It

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[23] Esslinger, Hartmut. 2013. *Design Forward: Creative Strategies for Sustainable Change*. Stuttgart: Arnoldsche Verlagsanstalt, 12.

[24] Esslinger, Hartmut. 2009. *A Fine Line: How Design Strategies Are Shaping the Future of Business*. San Francisco: Jossey-Bass A Wiley Imprint. iBooks version.

[25] Ibid.

[26] Esslinger, Hartmut. 2013. *Design Forward: Creative Strategies for Sustainable Change*. Stuttgart: Arnoldsche Verlagsanstalt, 208.

is usually known as design thinking and it usually takes the form of intertwining design into business and the technological aspect within the business entity, and thus using design as a strategic profession. Many companies other than those mentioned above tried to adopt design as a strategy, but most have hit-or-miss results and almost all have created poor design with this approach.[27] Esslinger concluded that those poor results were a result of an incomplete understanding of this school of thinking and not enough commitment in the execution of such thinking. However, he was hopeful that a better tomorrow is near and we shall all take part in making it a reality, as he ended his book *A Fine Line* with an optimistic note:

> As we prepare to enter this vast, new world of creativity in business, science, and industry, our mastery of today's "already here" challenges can guide us as we make "tomorrow" a productive and humanistic adventure. Welcome to the journey![28]

Conclusion of Design History Exploration

My exploration of a selection of design thinkers and practitioners in this chapter has shown that there is a succession of design thinking that was a result of an evolution of thoughts carried forward by various influential thinkers that stemmed from the Industrial Revolution. And the common threads which have been knitting and formulating such thoughts are the desire to unite work, life, and art; a democratic belief that goods that should be made at the highest quality and be affordable to all; and the relentless effort to make peace between technology and mankind to preserve the craftsman-like spirit of carefulness. Based on this investigation, it became obvious to me that design, business and engineering are the key participators in shaping such an ideal.

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[27] Wilson, Mark. 2015. Why Samsung Design Stinks: Blame Steve Jobs syndrome. *Fast Company*. http://www.fastcodesign.com/3042408/why-samsung-design-stinks (accessed June 10, 2015)

[28] Esslinger, Hartmut. 2009. *A Fine Line: How Design Strategies Are Shaping the Future of Business*. San Francisco: Jossey-Bass A Wiley Imprint. iBooks version.

One journalist from the online technology magazine, *The Verge*, aptly stated:

> Industrial design is a curious profession. Its practitioners are not quite artists, though they are artistic; they are not inventors, though they are inventive; and they are not engineers, though the best of them bring a deep technical understanding to their work.[29]

The quote above is an excerpt from an introductory comment by the journalist from an interview with Yves Behar, who recently sold a 75% stake in his firm FuseProject for $46 million. In an interview with Charlie Rose, Behar commented on a business model he called Venture Design:

> My goal has always been to create a situation where I would be doing the best design possible. Where the outcome would be the one I would be most proud of, where we could push the furthest in certain product category…. Unfortunately the traditional business model, just to be pay for short term contract doesn't allow you to do that. My thinking was that this (Venture Design) is the business strategy to create the best design possible.[30]

An effective practice of design shall encompass all three aspects, and it needs to adequately understand them, exercise them continually, and execute them in the right order at the right time. And in order for a design practice to strive, it needs the right conditions.

Conditions for A Design Practice

By conditions for a design practice, I am referring to the circumstances design needs and should inhabit. From my exploration of the "Design History" chapter, I have identified that design efforts often associate with the desire to unify work, life, and art, which suggests design efforts are more than a profession: they are a lifestyle or perhaps a series of choices that one makes in

[29] Newton, Casey. 2014. The Maker's Mark. *The Verge*. http://www.theverge.com/2014/8/6/5930539/the-makers-mark-yves-behar-fuseproject-profile (accessed April 29, 2015)

[30] Charlie Rose. 2014. Part 2 of Apple CEO, Tim Cook, and industrial designer, Yves Behar. http://www.charlierose.com/watch/60445755

life. And in order for designed goods to be the highest quality and remain affordable to all, they require the rapport of the society in which the design effort comes from. Furthermore, a harmonious working relationship between technology and humans involves a high level of interdisciplinary effort that not only requires a high level of technical competency, but it also demands a design-driven culture within a sound and healthy technology culture. These conditions are necessary for a design effort to prosper, and without them, a design would be ineffective and potentially useless. Therefore, in order to realize the power of design, it takes more than a person that has taken on design as a profession, it even involves more than the whole design discipline, and it even surpasses an interdisciplinary effort. It is a phenomenon that involves the whole community.

Where Good Ideas Come From

In his book *Where Good Ideas Come From*, Steven Johnson investigates how innovation occurs. He observes that ideas rarely come from a "spark of genius" or happen magically within a short period of time, but rather they occur through a slow process which takes time to mature and requires certain conditions to nurture them into fruition. Johnson gave a list of frameworks that aid this slow idea-forming process. The first framework is a concept that was a theory from evolutionary biologist Stuart Kauffman known as the "adjacent possible."[31] Kauffman uses it to explain how such powerful biological innovations as sight and flight came into being. And Johnson shows in his book that this theory is also applicable to science, culture, and technology. The principal idea is that people arrive at the best new ideas when they combine prior (or adjacent) ideas in new ways, as most combinations fail but a few succeed spectacularly. The second framework is that a good idea is a product of a densely populated

[31] Johnson, Steven. 2010. *Where Good Ideas Come From: The natural history of innovation*. New York: Riverhead books.

network that is plastic and capable of adopting new configurations, and this network should be placed in an environment that shares the same network signature. And the network itself has a specific characteristic; they ought to be networks of ideas or people that mimic the neural networks of a mind exploring the boundaries of the adjacent possible. The third framework states that a complete idea often starts out as an incomplete speculative idea, or a "slow hunch," and it needs the plastic network to connect to other slow hunches in order to eventually complete those ideas into a good one. The slow hunch framework resonates with Esslinger's belief that upbringing, the environment, and education have a major influence on one's design ability, and thus supports his notion that not everybody can be creative. Creative people put themselves in a position and environment to allow slow hunches to happen continually. The fourth framework "serendipity" states that the secret to organizational inspiration is to build information networks that allow hunches to persist and disperse and recombine. Instead of cloistering hunches in brainstorm sessions or R&D labs, designers should create an environment where brainstorming is something that is constantly occurring in the process. The fifth framework "error" states that a good idea is often an accumulation of mistakes; therefore, the emphasis is not placed on preventing mistakes, but on making many of them as fast as possible. This point echoes Verganti in his book *Design-Driven Innovation,* in which he states:

> Some company periodically pursues more-radical projects. And even when these efforts apparently fail (proposing products that are too extreme—beyond the borderline), that failure is the revealing moment in which the firm finally sees where the borderline was and is in the best position to make a breakthrough with the next project, before and better than its competitors.[32]

[32] Verganti, Roberto. 2009. *Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean.* Boston: Harvard Business Press, 110.

The sixth framework "exaptation" states that a trait may have a specific use, but then this trait gets hijacked for a completely different function. This process is crucial in forming good ideas. The key to fostering exaptation is to develop an internal development process explicitly structured to facilitate a clash and a connection between different perspectives. The seventh framework is 'platform', and it is a phenomenon that describes the synergic benefit of existing infrastructures providing incubation for future ideas to freely build on without the need of permission from the owners and administrators of the existing infrastructures.

The last chapter suggested a non-market setting network is better for innovations, but the market gives innovation a fertile ground to develop into more matured applications. Those developed innovations in turn become the adjacent possibles and exaptations. This view is supported by Bill Gates, founder of Microsoft. Expressing his view on the future of software not being free, Gates said, "You need capitalism [to drive innovation]. To have [a movement] that says innovation does not deserve an economic reward is contrary to where the world is going."[33] This notion supports the interconnectedness of design and business that Esslinger has advocated for, as one cannot strive without the other.

Certainly good ideas are key ingredients for good designs. *Where Good Ideas Come From* provides a solid set of frameworks for a design practice that focuses on creativity and innovation. However, a great idea alone is not enough; in order for an idea to mature into fruition, it requires adequate resources, a proper strategy, and good management to be successful.

[33] Friedman, Thomas L. 2007. *The World Is Flat: A Brief History of the Twenty-First Century*. New York: Picador, 1899.

Design-Driven Innovation

In his book *Design-Driven Innovation*, Roberto Verganti proposes a third strategy other than radical innovation: the type of innovation that is driven by technology and incremental innovation, which is the type that is pulled by the market. Verganti's proposal of a new strategy, which he calls design-driven innovation, pushes radically new meanings and can give a company long-term competitive advantages. The key to implement this strategy is to identify the kind of people he calls interpreters. They are the community of players, including artists, technology suppliers, and design schools that are sensitive to the sociocultural aspect in their surroundings, and they often seek and develop new visions of how meaning could evolve. He argues that by identifying and interacting with the right interpreters, companies can generate offerings with long life cycles, significant profit margins, strong brands, and sustainable growth.

Though the book is called *Design-Driven Innovation*, Verganti said his book is about management and focuses on how a corporation with a strong manufacturing base can leverage the power of design to have competitive advantages:

> This book is about the management of innovation and design. I have not talked about how designers, inventors, engineers, and scientists come up with creative ideas. Rather, I have examined the process through which executives leverage external and internal resources and creativity to develop breakthrough innovations. I was especially attracted by the fact that the success of Italian design is rooted in manufacturers rather than designers.[34]

[34] Verganti, Roberto. 2009. *Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean*. Boston: Harvard Business Press, 8.

Therefore it is interesting to investigate into this design-driven innovation from the perspective of designers, as to truly realize this innovation, designers must drive and manage the innovation process. I argue that it is possible and best when a designer is at the top of the chain of command, given that the designer has good business knowledge and sound judgement. After all, it is called *design*-driven innovation and not *manufacturer*-driven nor *corporate*-driven innovation. And to make it a truly design-driven innovation, designers need to learn about their intricate relationship with manufacturers and corporate individuals in order to be in a better position to drive innovation.

Verganti states that the design-driven innovation process is rooted in three actions:

1. Listening to the design discourse
2. Interpreting
3. Addressing the design discourse

For action one, he refers to it as "accessing knowledge about possible meanings and languages of new products." And to do that, he suggests seeking out interpreters with such knowledge and then internalizing that knowledge within the company. My interpretation of this concept is that a new product should start with a unique vision that designers often envision due to their unique experiences and close attention to the sociocultural trend shifting around them.

For action two, Verganti refers to the necessity for a company to conduct internal research and experiments that allow it to develop a radical new meaning and language. The objective is the same as action one, which is to conceive a new vision. Action one focuses on identifying interpreters and extracting visions from them, while the second action talks about conducting internal research alongside interpreters to generate company-specific visions.

Since a new vision and language are hard to grasp by the majority at their infancy, action three requires the companies that come up with them to support this paradigm change

through proactive investments aimed at facilitating the understanding, assimilation, and adoption of the new meaning. Verganti was not referring to advertising or product brochures that address the end users, but rather he was referring to interpreters because he believes the sociocultural language and vision are shaped and developed by interpreters and not the mass majority. He supports his point by quoting Bruno Murari, scientific adviser for MEMS at STMicroelectrioics: "Breakthrough innovation in a given field is envisioned by few people around the world, perhaps three or four. I really mean people, not organizations. You better know them."[35] The addressing is usually done in the form of cultural prototypes, such as books, exhibitions, cultural events, concept products shown at fairs, journal articles, presentations at conferences, the firm's showrooms, websites, special products for landmark pioneering projects, and design competitions. The interpreters will then be able to use these prototypes to transfer their knowledge and language into a new vision that the company needs.

The action of listening and interpreting appears to overlap in nature, and the objective for both is to seek a new vision. Although they seem to tackle the problem from different perspectives, they utilize the same assets: the interpreters, which is the key factor to both vision-seeking actions. Nonetheless, Verganti's research looked into the intricate relationship between corporations and interpreters, and it affirmed the role of interpreters, the type of people with a strong sensibility and influence in their life context. Verganti concludes that the three-action process

> is a proactive process that entails generating a new and proprietary proposal. It requires the internal ability to absorb external knowledge more effectively than competitors, to find unidentified combinations, to generate unique visions through internal experiments.[36]

[35] Ibid, 145.
[36] Ibid, 134.

A successful design-driven innovation from the perspective of a manufacturer or corporation relies on their ability to utilize internal ability and to absorb external knowledge. The key is internalizing, which arguably is the hardest thing to do. Hence it is arguable that it would be best for designers as interpreters themselves to be the ones who possess the ability and knowledge to execute and have ownership of the initiative. This innovation process will then become more direct and natural and, therefore, more effective. There are practical challenges for designers to take on an effective innovation process, such as learning the intricacies of running a business, the technical challenges in operating a manufacturing operation, and being in competition with existing players who specialized in business and manufacturing. However, as outlined in Thomas Friedman's influential book, *The World Is Flat*, the playing field is being levelled because of the emergence of Web 2.0. These levellers include social media, which links businesses directly to consumers and provides relatively low-cost and effective channels of advertising; e-commerce, which broke down the barrier of the high costs associated with distribution and retailing; and the power of uploading, which allows everyone to be an author and publisher, creating an abundant knowledge with a few keystrokes.[37] Moreover, lower manufacturing costs because of automation, matured manufacturing technologies, and machineries also contributed to the levelling of the playing field and give everyone a chance to compete against the giant corporations that were otherwise unbeatable beforehand. Designers are in the best position ever to take on this design-driven innovation process.

However, one question remains: how can a designer be the kind of interpreter that is needed to drive innovation?

[37] Friedman, Thomas L. 2007. *The World Is Flat: A Brief History of the Twenty-First Century*. New York: Picador.

Doing Research in Design

To interpret something implies that there is knowledge on two sides; the person who is interpreting is required to possess a deep understanding on both ends. The accuracy of the interpretation relies on how much knowledge the interpreter possesses and how well he or she draws the connection between the two ends. Hence interpreting is also a thinking process. How a designer thinks or what is design thinking is an interesting and well-researched topic in recent time.

The book *Doing Research in Design* begins with an in-depth discussion in positioning the designer. It states, "This book makes a pragmatic case for encouraging designers to embrace a systemization of thinking processes that are already implicit in the way they practice."[38] The thinking process starts with the way designers see the world. Designers differ from others in their ability to observe and, as a result, they develop a certain insight that other people rarely have:

> The designer is someone who is autonomous and has insight into the nature of the world, and who is also in constant dialogue with the social insights and expectations of others…. These observations can be developed by saying the designer has a set of practical intellectual and emotional attributes that are used to facilitate the way in which the world is understood by others.[39]

The world consists of systems which are fragmented, but the fragmentation allows us to gain a certain level of understanding in order to operate within reason in the world. Designers also inhabit these systems, and what they observe is also framed by the same systems, namely their society and culture:

[38] Crouch, Christopher, and Jane Pearce. 2012. *Doing Research in Design*. New York: Bloomsbury Academic.
[39] Ibid, 3.

> The designer works within both society and a culture.… The designer working within those differing contexts is still designing, but within markedly different social and cultural circumstances.[40]

The book gave an excellent definition for both society and culture: "A *society* is a group of people who live together within a particular physical territory and who share a sense of identity," while "A *culture* is the network of objects and ideas that communicate meanings to the members of a particular group of people."[41]

The book then unveiled a key concept to draw a connection between society, culture, and the designer. It is a significant philosophical concept to describe how designers think differently: "A useful concept in talking about how individuals negotiate with the social and cultural institutions that surround them is that of *reflexivity*." Reflexivity is a rather hard concept to understand. It has many definitions under different contexts and its meaning depends on the source of the definition. It is very much like creativity; someone who is creative can draw connections between seemingly unrelated things and produce a radically fresh outcome. Someone who is reflexive is able to notice, understand, and has the ability to synthesize how his or her action is affecting whatever he or she is acting upon and how that action ultimately will affect his or her identity. This is perhaps why there are a large percentage of designers who procrastinate and exhibit an inability to make even seemingly small decisions, because for a reflexive person, every decision has an unforeseen impact which ultimately affects their own identity, and therefore should not be taken lightly. In the book, reflexivity has been denoted as,

> a sociological term used by two sociologists whose work is featured throughout the first chapters of this book: Anthony Giddens and Pierre Bourdieu.
>
> ...

[40] Ibid, 3.
[41] Ibid, 2.

Giddens uses the term reflexivity to describe the processes of learning about who we are and of creating our identity.

...

Pierre Bourdieu uses it as a way of trying to ensure that social scientists are aware that the subjective cultural position the individual holds may influence that way in which he or she understands new information.

…

Both writers describe reflectivity as a process that enables individuals to identify their subjective relationship with the objective world.

…

Gidden: His argument is that the complexity of contemporary life, with its multitude of options for behaving and interacting with the world, means that we have to work at discovering our identity.

…

Giddens suggests that the reflexive process of understanding who we are (and we do this by looking at how we are constructed by outside influences, how we are moulded by institutional attitudes and how we then negotiate with them in order to find our own voice and values) is in effect a continual process of writing our own biography as we live it.

...

The concept of reflexivity has a threefold relevance. Firstly it is a useful idea to set against the view of Althusser.[42]

Louis Althusser, a French philosopher

[42] Ibid, 5–6.

argues that an individual is defined by his or her social function, that a 'single subject', a 'such and such individual', has ideas that are 'material actions inserted into material practices governed by material rituals which are themselves defined by the material ideological apparatus from which derive the idea of that subjects

...

Althusser's model of how institutional values mould us doesn't allow much autonomy for the individual.

…

Secondly, using Giddens's ideas about the way the individual interacts with institutional structures suggests both that we have the intellectual and emotional space to negotiate with the institutions that form us and that we make choices (either consciously or unconsciously) about who we wish to be.

Thirdly, the ability to understand who we are, what our views are and where they have come from allow us to try to position ourselves as objectively as possible in both the act of designing and of researching.

...this idea of both acting and being acted upon, but until it is understood how we have been constructed as designers or researchers by this process and can articulate it to others, we cannot fully understand how to research...[43]

and how to design.

[43] Ibid, 4.

> Successful design and research is dependent upon the meaningful exchange of ideas between individuals and the cultural and social circumstances they find themselves in.
>
> …
>
> The more individuals know and then more socially adept they are, the more likely they are to be able to understand the complexities of how the world is organized.[44]

It is important to understand the relationships and contexts between individuals and their cultural and social circumstances. This book then introduced a few more concepts to further elaborate the point:

Habitus:

> Our habitus appears to us to be common sense and natural; it becomes a space that we regulate 'without being in any way the product of obedience to rules'[45]

Field:

> a space that is demarcated by individuals and their actions, institutions and their debates.[46]

Praxis:

> the dynamic relationship between thinking and acting, between theory and practice.[47]

And our habitus is revealed in the field through reflexivity because a habitus:

> is of our own making, but made unselfconsciously. We can see it as a response to the conditions of the field because it is intimately connected with our experiences, which are the result of our engagements with the external world. But it is only by engaging reflexively with the institutions that mould us that we can reveal our habitus. The field

[44] Ibid, 7.
[45] Ibid, 12.
[46] Ibid, 8.
[47] Ibid, 14.

> and habitus are intimately linked, almost inextricably so, unless we make a conscious, reflexive effort to look at their interconnections.[48]
>
> …
>
> Individuals within the field are so caught up with that field's practices, both emotionally and intellectually, that they start to live within the confines of the field and its values. They begin to inhabit the field 'like a garment' (Bourdieu, 2000, p.143), comfortable inside it and displaying their own identity through the wearing of it.
>
> …
>
> researchers need to know how their own views might intrude into what they are researching and distort their understanding of what is going on. Researchers need to be reflexive in order to understand how they are being influenced.[49]

Designers are strongly influenced by the field whether we are aware of it or not. The field influences how we make our decisions. We make our decisions based on our judgement on those issues, and we based our judgement on how we recognized those issues.

> Misrecognition is one of the consequences of not fully understanding the way in which we operate in the field. In order to be as independent as possible, we have to struggle for autonomy within the field. In this way, by discovering how we are framed by the field's values and then making decisions as to whether we wish to be framed in that way, we are able to create a personal 'space'. Bourdieu calls the personal space we inhabit the 'habitus'. He uses this word to describe the way in which we behave and live our daily lives in response to the way that the field might organize us.[50]

The following bullet points summarize the interaction between the world systems and the designer:

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[48] Ibid, 12.
[49] Ibid, 11.
[50] Ibid, 12.

Both designer and researcher:

- have a lifeworld/habitus;
- exist within a system/set of material and ideological practices/field;
- have the potential to reflexively examine their position within that system/set of material and ideological practices/field;
- have the potential to act as well as be acted upon;
- have the potential to reproduce or transform the system/set of material and ideological practices/field in which they are positioned.

Designers have the potential to act as well as be acted on. We have to be aware of our own habitus, and even more importantly, we should struggle for autonomy within the field because that is how we can innovate and make the necessary change that is different from how the field is operating. This constant struggle in practicing in the field of design is the praxis of a designer.

Praxis is similar to practice as it is a form of practice, and the book gives two definitions for it:

Practice:

tasks and skills that are learnt and administered,

Praxis:

skills that are reinterpreted and re-applied even as they are learned…[in Praxis] action and thinking work dialectically.[51]

…

The researcher should not see practice as deterministic: the result of simple cause and effect. Nor should the researcher see practice as monolithic and fixed, because practice does change, sometimes led by ideas about practice and sometimes because of the

[51] Ibid, 42.

> introduction of new technologies that affect the ways in which things are done. It follows then that the relationship among habitus, field and practice is a dynamic one and that there is a connection between the capacity to act and the social structure that surrounds actions.[52]

Designers should not see practice as simply cause and effect from the direct application of knowledge and skills because in doing so, they are assuming that there is only explicit knowledge at work. When we apply knowledge, we assume that we explicitly know and are aware of everything that we are doing, but that is not true. There are certain parts of our knowledge that are tacit knowledge.

> The term tacit knowledge comes initially from the philosopher Michael Polanyi who described it as the phenomenon that 'we can know more than we can tell' (Polanyi, 2009, p.4)
>
> …
>
> tacit knowledge consists of sets of information and practices that we call upon unconsciously but cannot fully articulate.
>
> …
>
> Tacit knowledge is intellectual knowledge as well as physical knowledge; its practices are the result of using both intellectual and material tools.
>
> …
>
> Practice is a combination of tacit and explicit knowledge, and it is the researcher's job to unravel the two.[53]

[52] Ibid, 37.
[53] Ibid, 38–39.

> Practice is not just made up of 'doing', it is also related to ideas and theories. Ideas exist both as personal and as socially shared thoughts. They are the product of mental activity and can be the thought, or mental representation of something, or an abstract concept such as a belief or conviction. They are the result of testing or interacting objectively with the material world, or are produced through social interactions and adopted as part of a shared ideology.
>
> …ideological positions are created in the relationship between subjective viewpoints and social consensus, and designers and researchers have to navigate ideological issues as much as practical ones when designing.[54]

This is perhaps the biggest difference between practice and praxis, as according to Merriam-Webster dictionary, the definition for praxis is "a practical application of a theory." In comparison to practice, both involve doing, but praxis is lead by a theory.

> In his *Outline of a Theory of Practice*, Bourdieu talks about the dialectic between perceiving, understanding and acting that takes place in practice. He says that 'practice always implies a cognitive function, a practical operation of construction which sets to work, by reference to practical functions, systems of classification (taxonomies) which organise perception and structure practice' (1997, p. 97). In this modelling of practice, thinking and acting are partners, informing each other.
>
> …
>
> To theorize is not something that is done separately from doing; theorizing about something is thinking about how things are done. With this in mind, it becomes evident that practice is not in opposition to theory, but that the two are entwined. Part of the researcher's job is to understand that relationship.[55]

[54] Ibid, 34–35.
[55] Ibid, 39.

To better understand the concept of praxis, we can trace it back to its origin when Aristotle came up with the term:

> Aristotle who divided human activity into three parts, theoria, poiesis and praxis. Theoria can be thought of as theorizing or contemplation, especially the theorizing of what 'truth' might be…. Poiesis is the activity that produces things, using technical and planning skills. Praxis refers to the way in which we do things. So in an Aristotelian sense, praxis sits in a relationship between thinking and doing. Thought of like this, in its simplest form, praxis can be considered to be a way of thinking about action and a way of acting on thought. David McClennan refers to it as 'a philosophy of practical activity. [56]

Philosophers from around the world have also contributed their understanding to the concept of praxis:

> The German philosopher Karl Marx suggested that praxis was the way by which we developed a 'capacity for conscious creativity' (Kitching, 1988, p.26). Unreflexive practice, (practice that is the exercise of skills without thought) is not praxis.
>
> …
>
> Antonio Gramsci, the Italian philosopher whose idea were of great importance in the development of research into cultural studies (Hall, 1980, 1990), describes praxis as the 'worldliness of thought' and a philosophy of 'self-consciousness.' (Gramsci & Forgacs, 1999, p.429)[57]

Being aware of and having a good understanding of praxis and its relationship with world systems is important because the practice of a designer is dependent on it.

[56] Ibid, 39.
[57] Ibid, 42.

The more the researcher, aware of praxis, reflects on the habitus/field relationship, the clearer it becomes that issues of symbolic and cultural capital are bound up in the maintenance of practice.

…

Understanding praxis can help the researcher in the following ways:

- By giving the agency of the individual a context. The designer, the researcher and the end user of design exist within a cultural context that has been constructed, no matter how haphazardly, and the individual's personal agency is directly related to the practices that surround him or her.
- By helping to define the context of the individual's practice. What dynamic mix of theory and action, both historical and contemporary, distinguishes the individual's practice from others' or from the dominant model in the field.
- By demonstrating that particular kinds of action are related to particular ways of thinking, and vice versa. This means that different models of the conception of individuals and their relationship to practice can be understood more clearly. Praxis can help the researcher define habitus and field by observing the formation of practice. It can also help the researcher to understand the relationship of the lifeworld to the systems that colonise it by identifying how dominant practices are formed and validated and then identifying ways in which the lifeworld can resist acts of colonization.
- By helping to determine the ways in which the context of the user of design frames the way in which that individual responds functionally, emotionally and intellectually to designed objects or systems.

- By giving the need for an object a social context. The purpose and consumption of designed objects rests within a complicated network or sometimes conflicting demands.
- By exposing the researcher to a reflexive engagement with the practical, theoretical and ethical issues of research practice.
- By facilitating the researchers' understanding of the complex relationship between the ideological circumstances of the observer and the observed.
- By encouraging researchers to examine their own theoretical positioning and how that informs their practices.[58]

Another major difference between practice and praxis is that, for practice, after the act is complete, it is done. However, for praxis, the cycle of doing and thinking is never done. After the act is complete, the practitioner must reflect:

> Reflection on practice is when the practitioner has finished a task and is able to spend time considering why decisions were made the way they were or people behaved in the way they did.[59]

Reflection does not happen only after the practice, as:

> Reflection in practice requires the ability to think about 'doing' while one is engaged in the process of doing. This is especially important when the individual is working in what Schon calls the 'indeterminate zone' (1987, p. 12) of practice where there is ambiguity and instability. It is at this point that drawing from our experience but thinking in fresh

[58] Ibid, 45.
[59] Ibid, 45.

ways and reinterpreting information become essential if new knowledge, the outcome of research, is to be produced.[60]

…

The example Schon uses in his texts involve reflection about practice at an individual level. This is important because the individual is important, but if we also frame practice in terms of habitus and field or lifeworld and system we know that practice is bigger than the individual engaged in it and that practices are contested and contestable. It is important at this point to remember that the purpose of research varies, and that sometimes the researcher's aim is not just to interpret but also to critique.

….

Critical reflection is a form of praxis, where the observations, ideas and theories that have emerged from the research undertaken are given the potential to facilitate change or become agents of change.[61]

In my paragraph about the conditions of design practice, I stated that an environment that fosters a harmonious working relationship between humans and technology requires interdisciplinary practices, which suggests that the practice of innovation is not to be done alone but in a group or even community setting. The framework of exaptation states that innovation often occurs when one trait gets hijacked into a completely different context. The key to fostering exaptation is to develop an internal development process explicitly structured to facilitate clashes and connections between different perspectives. The different perspectives also suggest a practice that is in a community setting. The community setting is also beneficial for critical reflection, because a large group of people working together allows for collective

[60] Ibid, 45.
[61] Ibid, 46.

reflection. It is important to also welcome unwarranted criticism because advice is most needed when you do not want it.

> In using models of reflection on and in practice, the researcher is not just looking backwards in order to understand what has happened, but is also finding ways of looking forward. These ways of thinking are techniques that assist not just in consolidating past experience and knowledge but also help in anticipating new events. Reflection needs to be distinguished from critical reflection because one stays within the confines of a system of practice while the other leads directly to praxis. Reflexivity is a way of thinking about reflection that puts reflection into action, and acts as a concept that can unify many of the points that we have raised in the first part of this book.
>
> …
>
> Engaging in a process of reflexive self-questioning leads to the revelation of the limitations and the possibilities of habitus, and is an essential first stage in the development of a research project. This process is particularly important for the designer/researcher whose central role is to present new and informed understandings to others.[62]

An innovation has the ability to shift social paradigms and change people's cultural understandings, therefore a designer following a reflexive praxis is incredibly important. The act of making is not design; it is craft making at best and produces atrocities on a massive scale in the worst-case scenario. However if all design practitioners have a reflexive praxis, they will be able to maintain world systems and the people living in the world will greatly benefit from a world with better design.

[62] Ibid, 59.

Theoretical Perspectives

Confucius said, “At fifteen my heart was set on learning; at thirty I stood firm; at forty I had no more doubts; at fifty I knew the will of heaven; at sixty my ear was obedient; at seventy I could follow my heart's desire without overstepping the boundaries of what was right.”[63] As Confucius was an influential philosopher in Chinese culture, the phrase above, in which he reflects on his own life, is known to most Chinese people and is a model for our lives. As I’m writing this thesis at the age of thirty, the second segment of the quotation resonates strongly with me and causes me to think about why I am writing this thesis and what it means to me. Ancient classical Chinese is a very concise language when written; it is different from the spoken language of the day, and it is very much like poetry. “[A]t thirty I stood firm” in the original written Chinese only uses four words:「三十而立」, which, directly translated, means “three ten (thirty) thus stand.”

This short segment leaves “stand” open for multiple interpretations and meanings. The Chinese word stand is used to describe the posture of standing, it takes on a symbolic meaning, and it is the partial word for “established.” The four Chinese words therefore mean, “At thirty of age, I have established myself and my thoughts and I will not be easily swayed.” After reflecting on this phrase, I realize it is precisely why I am writing this thesis. At thirty years of age, I am spending a year to write down what I have learnt thus far in this world, and I am taking this opportunity to organize my thoughts, knowledge, and experience in the hope of this thesis being my reason to stand firm in the midst of factors that will sway me in an uncertain future and to establish myself. My definition of design is “the process to maintain goodness.” As I want to

[63] Confucius. 475 BC–221 BC. *Analects*.

define what I mean by that definition of design and I have a strong interest in establishing my own design studio to drive innovation, I have decided to dedicate this thesis to a thorough understanding of the role and practice of a designer in driving innovation.

> Today, many companies come to frog and say: "We want to be the Apple of our industry." And frog's response is: "First you must find yourself. Then you just must act and be as nimble and radical about excellence as Apple—adopting its framework of design as strategy, customer focus, innovation, processes with miracle-like prototyping, painstaking attention to detail, discipline, and real-money investment." Faced with this list, most walk off.[64]
>
> — Hartmut Esslinger, founder of frog design

Most walk off, but many did not. Apple is not alone in adopting this strategy and succeeding. Other successes include Yves Béhar's fuseproject, Elon Musk's Tesla, and Tony Fadell's Nest. Knowing that these different-sized companies in different fields have succeeded by using the same attitude and strategy described by Hartmut Esslinger, I am encouraged to want to be one of them.

The age of thirty is an interesting time for me because I have spent half of my life in the former British colony of Hong Kong, which is a world financial centre, a place where east meets west, where different cultures constantly influence daily lives, and the other half I have spent in Edmonton, Alberta, where I earned my bachelor's degree in Mechanical Engineering, worked for five years as an engineer, and then decided to pursue a master's in Industrial Design. In my design studies, I often heard a word I'd never encountered before: dichotomy. Its concept was not unfamiliar to me, for there were plenty of dichotomies in my life experience. Being born in Hong Kong, a supposed territory of China under British rule, my identity is dichotomous. As an engineer and a designer, my thinking and perspectives are dichotomous. These experiences

[64] Esslinger, Hartmut. 2013. *Design Forward: Creative Strategies for Sustainable Change.* Stuttgart: Arnoldsche Verlagsanstalt, 265

force me to see things from different perspectives and cause me to constantly question why things come to be and how things should be.

My father is a Chinese crafts retailer, and my mother is a manager of a trading company that specializes in merchandise. I was exposed to both art and design at a young age. I appreciated the beauty and wit of crafts and merchandise that surrounded me, but I did not see the relevance of craft in modern society in my dad's retail store nor the utility in most of the merchandise in my mother's company's showroom. So I decided that science and technology are the future, and I believe that robotics and cars are the perfect amalgamation of art and technology. My initial understanding of design was only concerned with aesthetic. My erroneous thinking led me towards engineering. But my lack of understanding design actually put me on the right path to becoming the designer that I always wanted to be: a designer who is dichotomous and who is concerned about form and function. During my school and working years as an engineer, I realized that in order for something to work, both form and function are critical. North Americans are living with excessive abundance, and there are many problems in other parts of the world that need to be solved. I have no doubt that all of us, designers especially, have an obligation to make positive changes happen. Furthermore, the recent study and apparent effect of climate change have informed us that the lifestyle and current consumption trend in North America are not sustainable. We must derive new ways that utilize our known knowledge to solve problems and imminent threats and to create a more sustainable future. But we must apply in new ways, so in other words, we need innovative solutions.

Based on the literature review and my own practice and observations, I have formulated an approach to establish a design studio practice to drive innovation. I will summarize the finding in the literature review portion using the following points:

1. The studio practice should stem from a desire to unite work, life, and art, a democratic belief that goods should be of the highest quality and affordable to all, and the relentless effort to make peace between technology and mankind to preserve the craftsman-like spirit of carefulness.
2. In order to have a constant flow of innovative ideas, the studio practice should follow the seven frameworks laid out in the book, *Where Good Ideas Come From*:
    2.1. Allow for adjacent possible, believing in the notion that people arrive at the best new ideas when they combine prior (adjacent) ideas in new ways, most combinations fail but a few succeed spectacularly.
    2.2. Good ideas are products of a densely populated network that is plastic and capable of adopting new configurations, and this network should be in place in an environment that shares the same network signature: networks of ideas or people that mimic the neural networks of a mind exploring the boundaries of the adjacent possible.
    2.3. A complete idea often started out as an incomplete speculative idea, a slow hunch, and this slow hunch needed the plastic network to connect slow hunches and to eventually complete those ideas into a good idea.
    2.4. Build information networks that allow hunches to persist and disperse and recombine. Instead of cloistering your hunches in brainstorm sessions or R&D labs, create an environment where brainstorming is something that is constantly running in the background.
    2.5. A good idea is often an accumulation of mistakes, therefore the emphasis is not to make sure a mistake is not being made, but to make many of them and make them fast.

2.6. Develop an internal development process explicitly structured to facilitate clash and connection between different perspectives.

2.7. Build an infrastructure that provides incubation for future ideas to freely build without the need of getting permission.[65]

3. Innovation is an interpretative process that is vision driven, and the visioning process largely relies on interpreters.

4. The vision needs to line up with the company's internal strength and technological capability.

5. The type of interpreters and designers that is capable of interpreting is the one that is capable of a reflexive praxis.

Adequate means to create

In order to facilitate and allow for the adjacent possible, the design studio shall have an adequate means to create—whether it is an adequate space, machines, or capable computers. As the fifth framework "Error" states that a good idea is often an accumulation of mistakes, the emphasis will not be to make sure a mistake is not being made, but to make many of them and to make them fast, and therefore prototyping is very important. The studio should take risks and educate their clients to take risks in order to have long-term competitive advantages. As the book *Design-Driven Innovation* states:

> Some companies periodically pursue more-radical projects. And even when these efforts apparently fail (proposing products that are too extreme—beyond the borderline), that failure is the revealing moment in which the firm finally sees where the borderline was

[65] Johnson, Steven. 2010. *Where Good Ideas Come From: The natural history of innovation*. New York: Riverhead books.

and is in the best position to make a breakthrough with the next project, before and better than its competitors.[66]

Multidisciplinary

The design studio and its designers' practices should be multidisciplinary and have a portfolio that spans a wide field of disciplines. Its designers should not specialize in any field for a prolonged period of time. The key is to have exposure to different perspectives, problems, and solutions, as the sixth framework "Exaptation" states a trait may have a specific use, but this trait gets hijacked for a completely different function. This process is crucial in forming good ideas. The key to foster exaptation is to develop an internal development process explicitly structured to facilitate clash and connection between different perspectives.

Multi-business models

While this thesis focuses its discussion mainly on design-driven innovation based on sociocultural opportunities, it is not the only practice for a design studio and, because of its risky nature, a solely design-driven design studio practice might not even be profitable and sustainable. In order for a design studio to be profitable and sustainable while putting a focus on innovation, the design studio needs to maintain a balance between the different types of innovation, including incremental innovation that is business-driven and radical innovation that is technology-driven. This might mean that the design studio needs to have a multi-tracks operation, which allows it to be able to afford necessary resources to support radical innovation and design-driven innovation initiatives.

[66] Verganti, Roberto. 2009. *Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean.* Boston: Harvard Business Press, 110.

Situate in an adequate technological and design culture

As Verganti's research in *Design-Driven Innovation* points out, a company's technological strength is key to its ability to innovate, and in order for a designer to be empowered to be the driver for innovation, possessing adequate technologies is key. Therefore the design studio should be situated in a location with an adequate manufacturing and technological base. Verganti also points out that the innovation process relies largely on interpreters, therefore having a good supply of interpreters is another crucial factor.

A densely populated studio with up to 150 people

The design studio should be densely populated because good ideas often come from a densely populated network that is plastic and capable of adopting new configurations and that explores the boundaries of the adjacent possible. However, there is a limit to how big this design studio should be: it shall be no bigger than 150 people. In his book *The Tipping Point*, Malcolm Gladwell states the research conducted by the British anthropologist Robin Dunbar indicates there is a relationship between the size of the neocortex of the brain and the size of social group. For *Homo sapiens*, that size is about 150. It is the maximum number of individuals with whom an individual can have a genuinely social relationship.[67] A genuinely social relationship among the people within the design studio is important because the second framework in *Where Good Ideas Come From* states that in order to have the same network signature, networks of ideas or people that mimic the neural networks of a mind exploring the boundaries of the adjacent possible, good communication and good relationships are a necessity.

[67] Gladwell, Malcolm. 2002. *The Tipping Point: How Little Things Can Make a Big Difference*. New York: Back Bay Books.

Keep brainstorming constantly running in the background

The key to successful and truly designer-driven innovation is to find the balance between managing a business well and making enough seemingly wasteful mistakes. On one hand, the company needs to be able to capitalize on its innovation, but on the other hand, it needs to resist the temptation of avoiding adventurous mistakes only because they are key ingredients to innovation. A good case study for this balancing act is Google's famous 20 percent time. An article on Wired.com states:

> Google's 20 percent time has historically worked like this: The company allowed employees to spend approximately one-fifth of their time — one day per week, four days per month, or maybe even a couple of months per year — working on a Google-related passion project of their own choosing or of their own creation.[68]

The policy led to products like Google News; Google's autocomplete system, originally called Google Suggest; Gmail; and AdSense, the advertising engine developed to support Gmail financially, now producing roughly a quarter of Google's revenue.

Google's 20 percent time is a well-researched and frequently discussed topic in the online community, *Harvard Business Review*, *Forbes*, and *Wired* magazine all have written articles about it. *Quartz*, an online business news publication, has written a three-part series that offers insight into Google's 20 percent time. The series consists of:

1. Google's "20% time," which brought you Gmail and AdSense, is now as good as dead
2. When 110% won't do: Google engineers insist 20% time is not dead—it's just turned into 120% time
3. 20% time is officially alive and well, says Google

[68] Tate, Ryan. 2013. Google Couldn't Kill 20 Percent Time Even if It Wanted to. *Wired*. http://www.wired.com/2013/08/20-percent-time-will-never-die/ (accessed May 21, 2015)

The first article reports that a former Google employee testifies:

> First, as has been reported previously, Google began to require that engineers get approval from management to take 20% time in order to work on independent projects, a marked departure from the company's previous policy of making 20% time a right of all Googlers.
>
> Recently, however, Google's upper management has clamped down even further, by strongly discouraging managers from approving any 20% projects at all. Managers are judged on the productivity of their teams—Google has a highly developed internal analytics team that constantly measures all employees' productivity—and the level of productivity that teams are expected to deliver assumes that employees are working on their primary responsibilities 100% of the time.[69]

The change seems to coincide with Larry Page's takeover as CEO on January 2011. The article says that "Page announced that Google would adopt a 'more wood behind fewer arrows' strategy that would put more of Google's resources and employees behind a smaller number of projects."[70]

Google Labs, a web page that showcased and tested many of Google's 20 percent time projects, announced its closure in a blog post titled, "More wood behind fewer arrows." Google Labs coexisted for a short period of time with the Google X research lab, which is a secret lab located half a mile from the Google headquarters, where many new projects are being developed. It seems like Google has adopted an approach to be selective as to who gets to innovate and who does not. This is consistent with my research as it states that innovation is largely driven by interpreters with a reflexive praxis and not everyone. Thus, giving differential

[69] Mims, Christopher. 2013. Google's "20% time," which brought you Gmail and AdSense, is now as good as dead. *Quartz*. http://qz.com/115831/googles-20-time-which-brought-you-gmail-and-adsense-is-now-as-good-as-dead/ (accessed May 21, 2015)

[70] Ibid.

treatment to interpreters and putting more resources in fewer promising ideas makes a lot of sense, especially in a publicly traded company where a business's bottom line is very important.

Shortly after *Quartz* published the first article, another Google employee who chose to remain anonymous made a counter statement: "I don't have to get approval to take 20% time, and I work with a number of people on their 20% projects."[71] The article continues with yet another Google engineer came forward to say:

> "20% time isn't dead — I have been using it at Google consistently for over 7 years, and it has immensely benefited me. You don't need any permission, at least in engineering. However, I would agree that it is 'as good as dead'. What killed 20% time? Stack ranking."
>
> Stack ranking is a policy—popularized by former GE CEO Jack Welch—of ranking employees by various metrics and firing the bottom 20%. Google doesn't enact exactly this policy, and is more focused on helping its bottom 20% improve, but the point is that such policies of measurement don't exactly lead to intangibles like incubating new initiatives or products….
>
> Apparently, 20% time is jokingly referred to within Google as "120% time" to indicate that, while engineers have the opportunity to pursue their own projects, it's only on top of their existing (often quite demanding) schedules. In practice, this means engineers who are especially motivated are free, as at any other job, to use their nights and weekends to do even more work.
>
> "Calling 20% time 120% time is fair. […] What 20% time really means is that you—as a Google eng—have access to, and can use, Google's compute infrastructure

[71] Mims, Christopher. 2013. When 110% won't do: Google engineers insist 20% time is not dead—it's just turned into 120% time. *Quartz.* http://qz.com/116196/google-engineers-insist-20-time-is-not-dead-its-just-turned-into-120-time/ (accessed May 21, 2015)

> to experiment and build new systems. The infrastructure, and the associated software tools, can be leveraged in 20% time to make an eng far more productive than they normally would be. Certainly I, and many other Googlers, are simply super-motivated and willing to use our free time to work on projects that use our infrstructure [sic] because we're intrinsically interested in using these things to make new products."[72]

Again, one of the seven frameworks from *Where Good Ideas Come From* can be seen here. The seventh framework is 'Platform,' which is a phenomenon that describes the synergic benefit of existing infrastructures providing incubation for future ideas to freely build without the need of getting permission. As Steven Johnson, the author of *Where Good Ideas Come From,* has been a repeating visiting scholar who gives talks at Google[73], it is not surprising the principles from his work coincide with Google's strategy.

In the third article, *Quartz* cited a Google+ post where it interviewed the Google Now founder after it was dubbed "Innovation of the year" in 2012 by Popular Science. In the interview, one of the founders, Andrew Kirmse, said:

> Google Now started when a few of us on the Maps team thought there was some really useful information we could show you on your phone based on where you are, and so we started working on it in our spare time, as a 20% project (as many projects at Google start). The further we got on the project, the more compelling it became, and everyone saw the potential of it.[74]

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[72] Mims, Christopher. 2013. When 110% won't do. Google engineers insist 20% time is not dead—it's just turned into 120% time. *Quartz*. http://qz.com/116196/google-engineers-insist-20-time-is-not-dead-its-just-turned-into-120-time/ (accessed May 21, 2015)

[73] Talks at Google. 2010. Authors@Google presents Steven Johnson: "Where Good Ideas Come From". https://www.youtube.com/watch?v=U3Ce3Vs0Ec0

[74] Mims, Christopher. 2013. 20% time is officially alive and well, says Google. *Quartz*. http://qz.com/117164/20-time-is-officially-alive-and-well-says-google/ (accessed May 21, 2015)

And therefore *Quartz* concluded that Google's 20 percent time is indeed "alive and well," except it is not a completely free and unrestricted 20 percent time for anyone to do just about anything. *Quartz* concluded:

> Surveying all that's been said on this subject—and there has been quite a lot of back and forth about it in the past week—it seems that Google continues to make its vast computing resources and stores of data available to its engineers for any project they might care to launch. However, in a work environment as demanding as the one at Google, it can be challenging to carve out the time to launch projects outside of an engineer's "day job." Perhaps it's simply the case that, as the joke at Amazon goes, work-life balance is for people who don't like their work.[75]

Much can be learnt by looking into how Google is managing its 20 percent initiative in order to understand the intricate balancing of running a business and striving to innovate. It has shown that as important as 20 percent time is to Google, Google still has to align it with the company's mission, internal strength, and the use of sound business practices. Evidently Google has managed it very well, as its stock in the S&P 500 on the New York Stock Exchange has one of the highest prices and it has innovative projects constantly in the pipeline like the Google Self-Driving Car, Google Glass, and Google Project Loon (a project which attempts to provide internet service with a network of balloons). The toughest alignment of all is perhaps the work-life balance that the joke at Amazon depicts; policy like Google's 20 percent time, which allows their employees to use the company infrastructure to build on previous ideas and innovate, will only work if people actually like their work and forsake their work-life balance. Or, to put it in a different perspective, it will work only if people have integrated work into their life. Again, this echoes my investigation into design thinkers and practitioners, which has shown that

[75] Ibid.

the common threads in design thinking are a desire to unite work, life, and art. John Ruskin and William Morris's strife has found a modern interpretation.

Methodology and Findings

There is no answer for the question, “Which came first: the chicken or the egg?” How something came to be or how to start something are the toughest questions to answer. Creating a multidisciplinary practice that has adequate space and machines—and at the same time capitalizing on innovative designs that do not pollute the environment nor produce junk that is quickly obsolete—is a daunting endeavour. One can only pray for a chance to make that happen—and I did.

I am a Christian of the Evangelical Protestant faith, and I attend a nondenominational church in Edmonton that has a thousand people in the congregation. One of the benefits of being in a large Christian community is that your social circle is very diverse, so you have older and younger friends and you get to see many different stages of life, which is a great learning opportunity. The idea that gave birth to the CUBOS PlayCube is partly the result of these influences. My two other experiences that contributed to the idea for the CUBOS PlayCube are my exposure to safety standards when I was practicing engineering and my enrolment in design school to pursue a master’s degree in Industrial Design. The design concept of the CUBOS came to me in a flash after a design school project had been briefed. I felt as if I came to this idea serendipitously, but even the fourth framework “serendipity” states that the secret to organizational inspiration is to build information networks that allow hunches to persist and disperse and recombine. My church is one example of such a network and the industrial design department is another. Therefore as I reflected upon the reasons and rationale for the design, I realized it took all seven frameworks at work to realize the idea of CUBOS. I will summarize this

journey into three factors that contributed to the final design and exemplify the seven frameworks as stated in *Where Good Ideas Come From.* They are gifting troubles, unsafe safety standards, and a new material: wood.

Factor One: Gifting Troubles

I attended my first wedding at the age of 17, and the weddings haven't stopped since. And babies usually follow those weddings. I dislike shopping, and I dislike shopping for baby presents even more. I am aware how important of a moment it is for the baby's parents, and I really want to show them how much I care and want the best for them with a gift. However, shopping for a gift that carries this message is very hard. I once bought a high-quality Japanese-made bib that was very expensive, knowing very well that it will only be useful for a year or two. My only hope was that the parents would recognize the quality of the item and that it was small enough to store, so they could keep it for the memories. The other gifts I've purchased are a baby monitor that monitors the baby's breathing and heart beat to avoid abnormality during its sleep—but again, it will become obsolete very quickly. I usually hope to spend under $100 on a gift that will last long enough to be worth the cost, and will carry the meaning that I love them and that I care. And, of course, it is a bonus if the gift shows that I have good taste and style.

Seeing my friends' kids with their toys reminds me of my childhood; their toys are just different versions of the ones I had. I've had to witness some of my favourite toys break, which in turn broke my heart. However, I no longer have any of my old toys, which gives me a somewhat lonely feeling, but if I did get any of them back, it would be pointless because I'm too old to play with those toys. However, I have a friend who keeps on buying new toys, but ones that are more expensive than when he was a kid. A company called Hot Toys makes very

realistic action figures, which cost on average around $250 USD. These toys are collectables as well, and most of them increase in price over time as they gain popularity. I am envious of his passion for these toys, but I don't have enough interest in them to buy or collect them. His interest has triggered my desire to find a toy I can own at any stage of life and won't be embarrassed to be seen with it.

Factor Two: Unsafe Safety Standards

After graduating from Mechanical Engineering, I worked for a PVC pipe-manufacturing company, where my main responsibility was to support maintenance and production with hardware design and machine maintenance. During the five years that I worked there, I was involved in many different projects. Some of the projects were to enable production or to make certain operations possible by designing new fixtures and machines, while others were to increase production efficiency or to eliminate safety hazards and concerns. Industrial environments use a lot of chemicals, including cleaners, lubricants, adhesives, and resin. I was often consulted on their use because of my science background and education, and I had to deal with them because they were often a part of the system and operations that affected my work. Because of their inherent safety risks, chemical safety became an everyday topic in my work as an engineer.

To ensure that workplace hazards are somewhat controlled and people won't be injured or die from mistakes caused by an uneducated and careless business owner, the government has come up with standards such as the Occupational Health and Safety Act (OHSA). This act sets standards for many aspects of occupational health and safety, such as the occupational exposure limits (OELs) for over 700 chemicals. The chemical that bothers me the most is styrene. Styrene is a major component in resins, which are used to make fibreglass-related

products. It is a known carcinogen and has a foul and strong chemical smell that is very repelling. The odour threshold for styrene is 0.1 parts per million (ppm), which means if there is one molecule of styrene in ten million molecules of air, you will smell it. Yet, the time-weighted average (TWA)—the concentration that is allowable for someone who has to be exposed to a chemical for 8 hours a day—is 35 ppm, and the short-term exposure limit (STEL), which is usually 15 minutes, is 100 ppm[76]. As long as the concentration is within the OEL established by the OHSA, then it is considered acceptable. I find it hard to accept, and it makes me wonder what kind of products are out there that are used daily or ingested that follow similar safety standards that do not seem that safe. I am further bothered that companies often use this standard as the reason to not implement a system that could mitigate the risk. Safety standards have replaced common sense and our natural senses to determine what is safe and not safe. When I thought of making a children's toy for my loved ones, I decided I would make it as safe as possible to the best of my knowledge and without making any compromises. My years of experience in finding gifts and working as an engineer were my "slow hunch." As the third framework states, a complete idea often starts out as an incomplete speculative idea, and it needs the plastic network to connect to other slow hunches in order to eventually complete those ideas into a good one.

Factor Three: New Material: Wood

I vividly remember my first engineering statics and dynamics class, during which the professor explained the differences between homogeneous and isotropic materials. The professor stated

[76] Province of Ontario. R.R.O. 1990, Reg. 833: CONTROL OF EXPOSURE TO BIOLOGICAL OR CHEMICAL AGENTS. http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900833_e.htm. 18. (accessed May 25, 2015)

that in engineering we mostly only deal with homogeneous materials, which have a uniform composition and the property of the material is not directional sensitive. That last characteristic means no matter which way you apply a force, the material will react the same. For example, steel is a homogeneous material and wood is not. None of the formulas and equations I learnt in class work for wood, and in my next five years of engineering school, we did not learn anything about wood as if it were an inferior material with no value to be gained in learning about it. There is not one woodworking machine in the mechanical engineering machine shop at the university, and engineering holds very little regard for wood. I was too busy to learn everything about homogeneous material engineering, but rightfully so because it is very important, as without it, skyscrapers, cable bridges, cars, planes, submarines, and rockets would not have been possible. But I always felt there was a disconnect because I see wood everywhere, particularly in building houses, and therefore it must has good properties and a reliable and calculable strength. Many types of furniture are made with wood, and it adds beauty to the furniture, often resulting in higher prices than a piece of furniture made from a common engineering material. I was always curious about wood products, though my knowledge about them was very little.

When I enrolled in industrial design, it was obvious that their attitude toward wood is the opposite of the one in engineering. The industrial design workshops are mostly for woodwork, and though there is a set of metal-working machines, their utilization rate is not very high. For a few projects, I specifically had to use wood, and I took them on with delight as they were an opportunity to learn about wood. I noticed that not only did the two materials behave differently, but also that the people who worked with the materials behaved differently. Metal machining is a very precise and meticulous process that relies on a lot of special tools and careful execution. While in woodworking, the process is much more fluid and not as precise, and tolerance is a non-issue in woodworking. As I had a metal-machining background, I found myself using the

same attitude for metal working as woodworking, and often I received dismissive comments, such as I was wasting time, there will no difference, and something cannot be done. But regardless, what I realized is that I had put myself into a network that is plastic and capable of adopting new configurations, and this network should be placed in an environment that shares the same network signature. I think I share the same network signature with the people at industrial design as I felt very at home and welcome at the program. Perhaps we are all the same type of person that mimics the neural networks of a mind exploring the boundaries of the adjacent possible. This is the second framework at work: a good idea is a product of a densely populated network.

CUBOS Design Concept

When I think of the design concept for CUBOS, I was unaware of it at the time, but I evidently applied the principles for designing metal parts and assembly into the wooden toy. Just like the sixth framework "exaptation" states that a trait may have a specific use but then it gets hijacked for a completely different function, I hijacked the design practice and requirements in metal parts and transferred them into woodworking. In mechanical design, repeating parts are often utilized because once the machine is setup to produce the part, the time to produce an exact duplicate of it is very minimal in comparison to the setup time; therefore repeating parts are desirable. There are two sets of repeating parts in a CUBOS: a set of twelve identical parts and another set of eight. Ease of manufacturing is another consideration for designing a machine. All the toy's features are based on ones that can be easily made and are common on metal parts, such as straight cuts and steps. Ease of assembly is another important concern. The features are mostly flat and sit on top of each other, and they are designed so that the assembly will be easy and no extra effort will be needed to hold them together while putting them together. However,

in order for twenty parts to come together seamlessly, a tight tolerance is needed. It is tight for the wood standard, but it is a relatively low standard in metal working: 0.02" (twenty thou, which is about 0.5 mm).

One thing I learnt from working with wood and am fascinated by is the way wood looks naturally. A consumer rarely sees wood products in their natural form, as wood in the market is usually stained and finished. When I see the wood in its unfinished state, I am attracted to its natural beauty, and I realize all those stains and finishing treatments are not necessary. I decided to leave the wood in its natural colour and use four different types of wood with different natural colours to produce an aesthetic and proportional contrasting effect. Moreover, having no extra add-ins for the wood means that there will be no chemicals added, which means the toy will be 100 percent natural other than the glue used to put it together. I even studied the Material Safety Data Sheet (MSDS) for the glue and concluded that one would have to ingest the amount of glue in one hundred CUBOS to cause a "slight irritation," and that is assuming the active ingredient boric acid in the glue was not neutralized as it reacted with the wood. To my best knowledge and given the resources available and the circumstances allowable, I believe the CUBOS design is the safest toy chemically I can make it. Furthermore, I researched the possibility of the small pieces being a choking hazard, and I looked into the safety standards for toys in Canada to make sure I followed all of the guidelines. The materials for the CUBOS's first prototype were scraps from a previous school project, a Noguchi-inspired side table. The side table provided partial materials to the project, which made the idea of an all-hardwood toy more appealing because hardwood materials are not easy to come by and work with. And the side table also determined the use of cherry wood for the CUBOS, as its warm reddish colour and that it is a nice wood to work with made it a natural candidate for my next project. The drudging experience of hand sculpting the side table motivated me to design features on the CUBOS to be machine shapeable. All of those exemplified the first framework of the "adjacent possible,"

where one arrives at new ideas when they combine prior (or adjacent) ideas in new ways. In the first production run, I used plywood, but after researching the glue used in plywood and learning it contained formaldehyde (which is another known carcinogen), I switched out the plywood for hardwood birch in the second production run. This increased the cost and made the process more complicated, but it was not a compromise I was willing to make.

Initially, I had no intention to make more production runs for CUBOS as the school project had an actual client and they were interested in pursuing the product. However, since I delivered the project, I have not heard from them and later heard that they were closed due to budget problems. My intention behind quitting my engineering job was to start a counselling practice of my own to design and build. I have always wanted to develop a product to sell, but the CUBOS was not my first choice for a product to put into development because the cost for it would be too high and it is a labour-intensive product. I have other prototypes and ideas that were intuitively more reasonable to pursue, but I was not planning on pursuing them before graduation. However, my twin nieces' first birthday changed my plan. And together with the fact that I was curious how much the CUBOS would cost and how much time I could save if I experimented with a more efficient process, I decided to do a production run. The production run was conducted in the industrial design shop before I had decided that CUBOS would be my thesis project. This was allowed because master's students have relatively unrestricted access to the industrial design shop. Without a fully equipped shop, the production run would not have been possible because many procedures require heavy machineries. This exemplifies the seventh framework of "platform," as I was able to enjoy the synergic benefit of existing infrastructures providing incubation for future ideas to freely build on without the need of permission from the owners and administrators of the existing infrastructures. Though, all of my professors and shop technicians were well informed in what I was doing and were very supportive of the initiative. During the production run, I documented the process by taking notes

of the time, recording videos, and taking pictures. I posted the pictures on Instagram and Facebook to show off the interesting things going on in my life, and the posts received a lot of interest and the final product received even more interest. Many of my friends wanted one and some even offered to pay for it. This exemplifies the levelling effect of social media stated in the book *The World Is Flat*—I was able to reach a large amount of friends without any cost or serious effort. And when I gave them to my nieces on their birthday, they played with it continually for 40 minutes, which surprised my sister because it had far exceeded my nieces' concentration time span. I learned a lot during the first production run, and I was not happy about the quality of some of the final products. And after researching the formaldehyde glue content in plywood, I decided to do another production run with plywood switched out with hardwood and a tighter tolerance in all the parts. Also I sought out contractors to produce parts for me in order to test the scalability of the product. And in order to test the response to this product with a broader audience, I decided to enroll in the Royal Bison, a highly acclaimed local art and craft fair.

Royal Bison

In total, I made 40 CUBOS and set the price for one at $89. I sold five at the first three-day craft fair in May 2014, and I sold at the Royal Bison two more times in December 2014. Together with my friends that bought, I sold 17 CUBOS and have given away seven to my friends' babies to date. As people will buy CUBOS at its price point, it proves that it is a sellable and desirable product. On top of that, sitting at the Royal Bison and observing people's reaction to and interaction with the toy and listening to their comments have given me valuable insights. The following is some notes and my reflection.

Observation 1:

Most people walked by and commented that it is beautiful.

My reflection:

The word beautiful was repeatedly used when different people saw the toy and complimented it. Beautiful is not a word that people use lightly, and I did not dare to label any of my design as beautiful. Based on this observation, I changed the copy for the toy's description, which now says the toy is a "beautifully constructed hardwood PlayCube."

Observation 2:

A lot of people, especially women in their late 50s and 60s, commented that it is the wooden version of the Tupperware sorting toy.

My reflection:

The Tupperware sorting toy was a popular item that is widely recognizable, and people naturally associate it with CUBOS because they are technically in the same category. There are advantages and disadvantages in having a product association. It caused me to ponder how I could use the association to my advantage and how I could differentiate the CUBOS from the Tupperware toy, especially when my toy is more expensive.

Observation 3:

To my surprise, a few people asked what the toy was and what to do with it. I was surprised because I thought the answer to those questions were obvious just by looking at the toy. Some people understood instantly not only what the toy was and how to play with it, but also the deeper meaning in the design philosophy.

My reflection:

This is the point when I realized I have a lot of reasons for coming up with the CUBOS. Some people got it instantly when they saw the product, and some people are completely clueless as to what it is. I realize I have to have a better understanding of the reasons why I came up with the toy, and I need to communicate them better to people. As Verganti has pointed out, addressing the design discourse is one of the key activities in driving innovation.

Observation 4:

Most people perceive that it is an item for children, so it would be for somebody else and not for themselves.

My reflection:

It has informed me that the target audience for this toy should be children and not adults, who might like it to be a shelf or desktop decoration, because the perception of it being a children's toy is very strong.

Observation 5:

Some elderly women commented that they wished they had grandchildren.

My reflection:

This group of people are some of my target customers: grandparents who want to spend money on their grandkids.

Observation 6:

Some people said the toy is too old for someone or too young for someone.

My reflection:

There is a perceived age appropriateness for CUBOS.

Observation 7:

A lot of people asked if I had a website and took my business card.

My reflection:

People are concerned about the legitimacy of the toy and business, and they will consider the toy for a future purchase.

Observation 8:

No purchase was an impulse buy, as the customer always had to return to make the purchase.

My reflection:

People who buy CUBOS do so after a well-considered decision, therefore there needs to be an ongoing effort to market and sell the toy and either physical retail or online retail is needed.

Observation 9:

Almost all purchases were for gifting purposes.

My reflection:

My target customers are people who buy the toy as a gift.

The Royal Bison is an exciting place to be with a lot of opportunities to test out products and make observations. Malcolm Gladwell would call it a maven trap. In *The Tipping Point*, Gladwell

stated that there are three types of people who contribute to word-of-mouth epidemics: connectors, mavens, and salesmen. Mavens are the people who possess knowledge and are widely recognized as such. And a maven trap is a good place to find these people who have information and influence.[77] I indeed received a lot of useful comments and observation from these mavens and a few useful contacts and leads. But in order to create an epidemic type of success, I still need connectors and salesmen. Connectors are the people who know people, and salesmen are people who have the mesmerizing power to promote. And all of the above can be found on Kickstarter.

Kickstarter

Having an epidemic type of success was not part of my objective, thus the decision to go on Kickstarter was not initiated from a desire for reaching a certain number of sales. Kickstarter is an online crowdfunding platform, and it is currently the biggest and most recognized crowdfunding platform[78]. This is how it works: The project initiator will make a pledge for a certain amount, and in return, there will be multiple rewards for a purchase., If the pledge amount is met, the project initiator receives the whole amount of the pledge minus a 5-10% fee collected by Kickstarter. However, if the pledge amount is not met, the project initiator receives no money. I was reluctant to do a Kickstarter campaign because I am interested in a multi-track business: one part counselling and another part niche product production. I was afraid that going on Kickstarter might move the focus to the product side, whereas my original intention was only to sell in a small volume. The attention and volume that could be the result of

[77] Gladwell, Malcolm. 2002. *The Tipping Point: How Little Things Can Make a Big Difference*. New York: Back Bay Books.

[78] Mollick, Ethan. 2013. The Dynamics of Crowdfunding: An Exploratory Study. The Wharton School of the University of Pennsylvania. Elsevier Inc.

Kickstarter campaign was not part of the objective. Besides, starting a counselling practice is not a good project category on Kickstarter as the platform recommends a specific and tangible goal. Therefore initially I was reluctant to do a Kickstarter campaign. However having considered all the observations made at Royal Bison, specifically the need to address and communicate the product and to give it legitimacy, Kickstarter was a very good venue to achieve those specific goals. Furthermore, in my search for contractors, I found a local one that has advanced machinery and could make parts for me in a substantial quantity efficiently, and was able to minimize logistics and my supply chain issue. This working relationship is a desirable asset as my previous investigation has pointed out that harnessing technologies and the ability to produce is the key to democratize high-quality goods and to drive innovation. The contractor required a minimum order of 250 units, and with the rationales I derived from attending Royal Bison and in order to support my thesis that a designer should utilize the levelling power of the Web 2.0 and take control of the innovation process, Kickstarter became my obvious next step.

Most of the hard work for Kickstarter ought to be done before the campaign even starts. This work includes developing the product, securing suppliers and contractors, identifying the target audience for the product, and strategizing ways to promote the product to them. However the highlight of the Kickstarter process is the campaign itself: the 30-60 days for which the project will be live on the Kickstarter site for people to see and to pledge on. I plan to align the campaign to end with my graduation show and make the ongoing result of the campaign a showcase in my graduate show. The show will be an illustration of my thesis, which is a designer's role and practice in driving innovation and the innovation story and philosophy behind my product CUBOS. It is uncertain whether the Kickstarter campaign for CUBOS will be a success or a failure. A successful attempt will prove my formulation for a design practice and positively reinforce my practice reflexively. However, a failed attempt will not disprove my thesis,

because like the fifth framework “error” states, a good idea is often an accumulation of mistakes. It may just be another mistake I accumulate and contribute to my life-long reflexive design praxis for hopefully many eventual successful innovations.

Conclusions

My investigation into the question, “What is the designer’s role and practice in driving innovation?” has resulted in an understanding and appreciation of the spirit behind the past effort and visionary goal of design from past design practitioners. It has shown that there is a succession of design thinking that was a result of an evolution of thoughts carried on by various influential thinkers since the Industrial Revolution. And the common threads that have been knitting and formulating these thoughts are a desire to unite work, life, and art, a democratic belief that goods should be of the highest quality and affordable to all, and the relentless effort to make peace between technology and mankind to preserve the craftsman-like spirit of carefulness.

I conducted literature reviews from which I identified a set of frameworks to provide the best setting for trial and error, which is the basis for fostering good ideas. I derived a further understanding as to how these good ideas can have the best chance to succeed with a focus and goal aligned with the company’s strength and a proper recognition of the role of interpreters and their involvement in the process.

I then reviewed the concepts and studies from sociology in order to understand what factors shape interpreters and the necessary traits for an effective designer/design researcher. I formulated and presented a practice based on the investigations and findings in the thesis. I illustrated a design case study for the design of the CUBOS, which is a hardwood sorting toy that demonstrates the thesis. I tested the CUBOS at a local craft fair called Royal Bison, and I decided to do a Kickstarter campaign from the observations I made at the craft fair. The conclusion for the Kickstarter campaign will not be certain until the end of the grad show, but either success or failure of the campaign will be relevant to and support this thesis.

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Appendix-A: CUBOS Kickstarter Campaign

Campaign link:

https://www.kickstarter.com/projects/180622852/cubos-hardwood-shape-sorting-toy-made-in-canada?ref=nav_search

Campaign video:

https://www.youtube.com/watch?v=_6jFXUzkGsw

CUBOS is a beautifully constructed hardwood shape sorting toy. It's a great toy for a two-year-old, or even someone who is one hundred and two years old, making it the

perfect life-long companion. Each CUBOS is constructed with extremely quality woods, including Birch, Cherry, Maple, and Walnut. It's designed to be free of choking hazards and uses no harmful chemicals. Only glue holds it together, and Beewax is used to give it a shine. The CUBOS is designed to be safe, loved, and last for a long time.

-High quality
-Timeless appeal
-Long lasting
-Safe

We believe inspiration begins at young age. Those inspirations should stay and be carried into our adulthood, however with how things are being made and consumed today, our only baby toy options are things that will eventually be obsolete and thrown away. Along with the item that get thrown away, so are memories and inspirations. CUBOS is an alternative.

CUBOS is carefully crafted with highest quality hardwood. It has an aesthetic that is timeless and it is intended to appeal to both babies and adults alike. It is safe enough

for a baby to play with and it is intriguing enough to be kept on an adult's work desk. The CUBOS is an item that is meant to stay and last for a long time, perhaps more than a lifetime.

Anson Wong & co.

+

Mcmurray interiors

CUBOS is a school project that turned into a 3 year long inquiry. After 2 iterations and 2 production runs, it finds itself at Kickstarter. If the campaign is successful, Anson Wong will be hands-on producing and personally manage the production effort.

McMurray Interiors, a large local woodworking millwright shop, has provided a feasible quote and timeline that this Kickstarter campaign is base on. They will be providing hardwood parts for CUBOS if the campaign is a success.

http://www.mcmurrayinteriors.com

Edmonton, Alberta, canada

Edmonton is the Capital for the province of Alberta. It is in western Canada, 1,160km(720 miles) North East from Vancouver and 300km(186 miles) North of Calgary.

Edmonton is a gorgeous winter city with over half of the year covered in snow. However it has been recently feature in National Geographic as one of "Top 10 Best Summer Trips". And I can personally testify Edmonton has the best Summer I have experienced anywhere.

National Geographic article link

Home to Alberta Gallery of Art and many artistic endeavours including Royal Bison Craft Fair, Fringe Festival, The Works, Art walk. Edmonton is the fertile ground and reason for the idea of CUBOS to take root and nourish into a reality.

Alberta Gallery of Art

Royal Bison Craft Fair

Fringe Festival

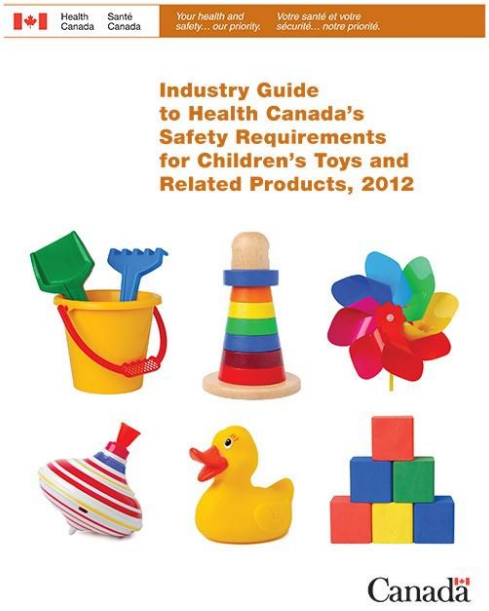
The Works Festival

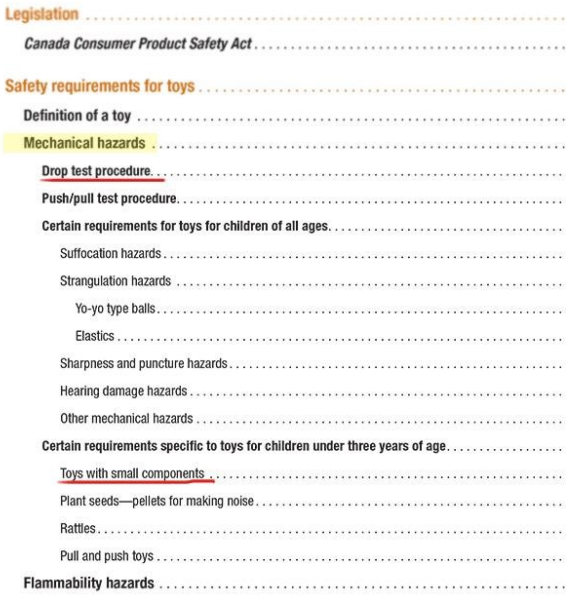
The Art Walk

The design of CUBOS conforms to Health Canada guideline, particularly the **Industry Guide to Health Canada's Safety Requirements for Children's Toys and Related Products, 2012.**

You can obtain a copy of the guide from the following link:

Download "Industry Guide to Health Canada's Safety Requirements for Children's Toys and Related Products, 2012"



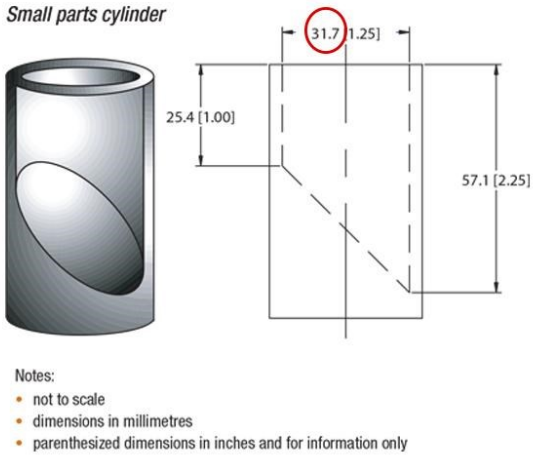


Since CUBOS contains no hazardous material or chemical, most of the requirements do not apply to CUBOS. However the category of Mechanical hazards do apply, specifically "Drop test procedure" and "Toys with small components".

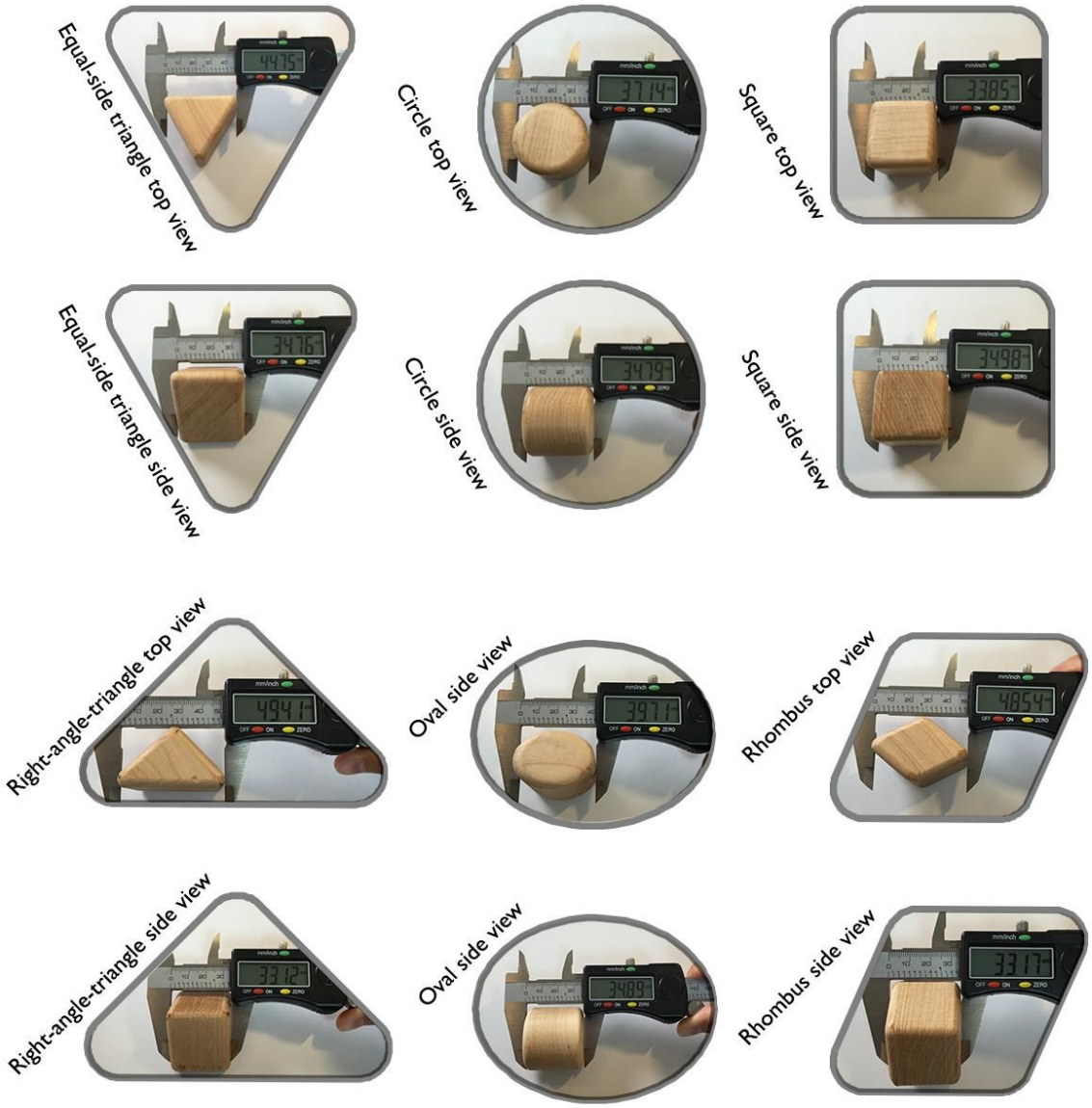
Toys with small components

from Page 6 and 7 of the brochure...

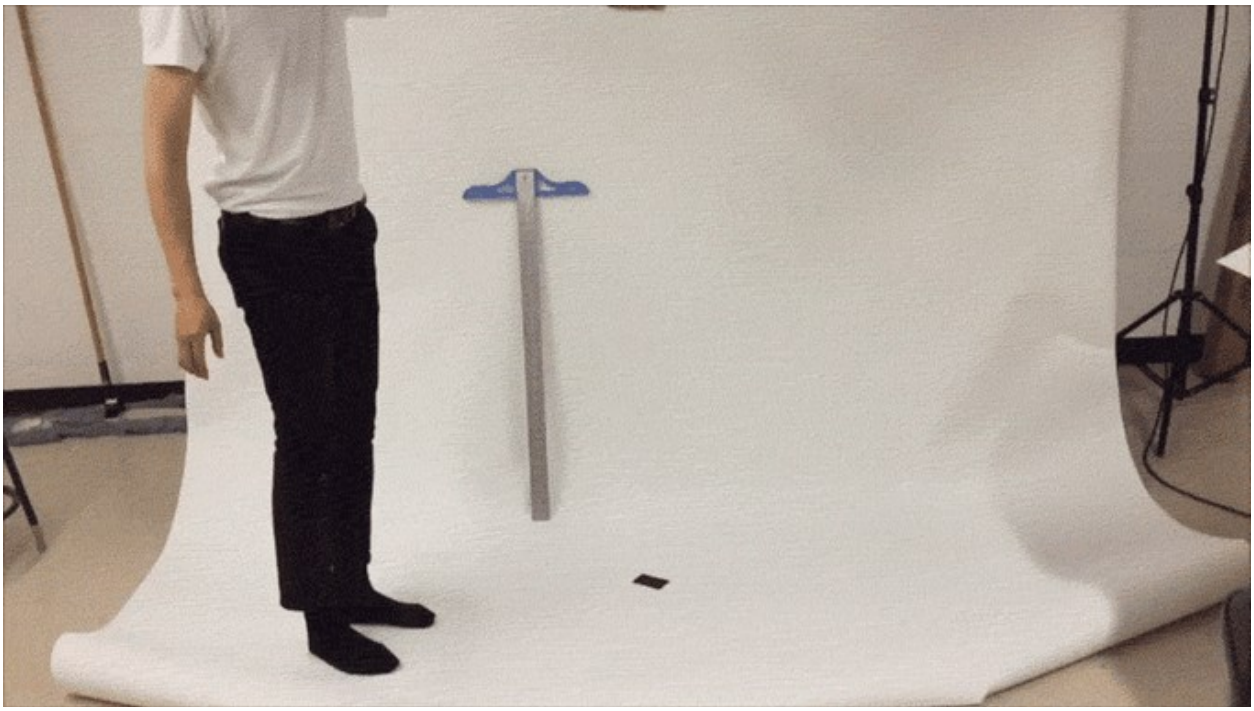
If a separable or detachable toy component can be totally enclosed in the small parts cylinder, as illustrated, using a force of 4 .45 newtons (1 pound force) or less, then the toy does not meet the requirement .



The requirement forbids components that can be totally enclosed in the 'small parts cylinder'. Note that the 'small parts cylinder' has an opening diameter of 31.7mm, therefore components that are bigger than 31.7mm will not be able to enter into the cylinder, let alone enclose in it. The CUBOS insert pieces(POCOS) are designed to be bigger than the opening of the 'small part cylinder', making the CUBOS and POCOS choke hazard free.



Drop test procedure



From page 4 of the guideline:

“The Product Safety Laboratory Method M01 .1 drop test procedure states that a toy be dropped four times onto a tile-covered concrete floor . Each drop is conducted with the toy in a different orientation . The orientations chosen are those considered as most likely to cause damage during the drop . A toy is dropped from a height of 1 .37 metres (4 .5 feet) if it is likely to be used by a child under three years of age . It is dropped from a height of 0 .91 metres (3 feet) if it is likely to be used by a child of three years of age or older . Following each drop the toy is inspected for applicable safety hazards such as detached small components, sharp points and sharp edges .”

The following video is the complete drop test for CUBOS:

https://www.youtube.com/watch?v=vNDjD23g-Q0

In conclusion, the CUBOS uses no hazardous material or chemical, its design follows the Health Canada guideline. It is designed to be both chemically and mechanically safe.


Reward #2 complete drawing package
(aka DIY plan)
$25 CAD
(~$19 USD)
CUBOS Hardwood PlayCube
Hardwood PlayCube - Design By Anson Wong
Kickstarter exclusive
Reward #3 Maple Poco set 6 pcs
$25 CAD (~$19 USD)
Retail price at $50 CAD (~$38 USD)


Reward #3 Maple Poco set 6 pcs
$25 CAD (~$19 USD)
Retail price at $50 CAD (~$38 USD)


Reward #4 Premium Walnut Poco set 6 pcs
$35 CAD (~$27 USD)
Retail price at $70 CAD (~$54 USD)


Reward #5 DIY CUBOS Kit (34 pieces)
$75 CAD(~$58 USD)
CUBOS
Hardwood PlayCube
Retail price at $150 CAD (~$116 USD)


Reward #6 CUBOS & Maple Poco set
$99 CAD(~$76 USD)
Limited 25
Early bird
CUBOS
CUBOS
Hardwood PlayCube
Kickstarter exclusive


Reward #7 CUBOS & Maple Poco set
$128 CAD(~$99 USD)
CUBOS
CUBOS
Hardwood PlayCube
Retail price at $250 CAD (~$192 USD)


Reward #8 CUBOS & Walnut Poco set
$138 CAD
(~$106 USD)
CUBOS
CUBOS
Hardwood PlayCube
Retail price at $268 CAD (~$206 USD)


Reward#9
West of the 4th weaving specials
$160 CAD (~$123 USD)
Special edition west of the 4th handwoven bag
+
CUBOS + Maple Poco set
+
Premium Walnut Poco set
CUBOS
hardwood PlayCube
Retail price at $340 CAD (~$257 USD)

An interview with the Harder family~

https://www.youtube.com/watch?v=-C6BSRZ8W1c

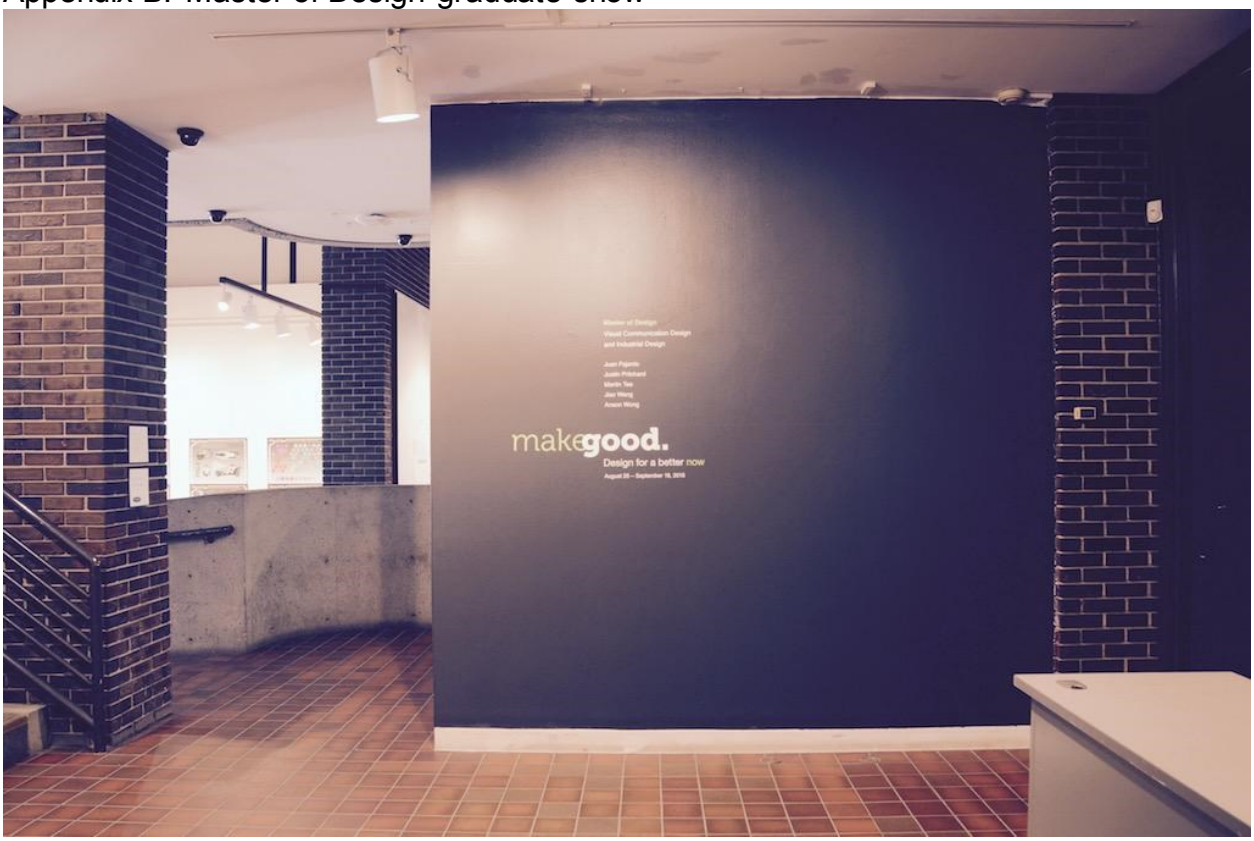
CUBOS official website

CUBOS Facebook

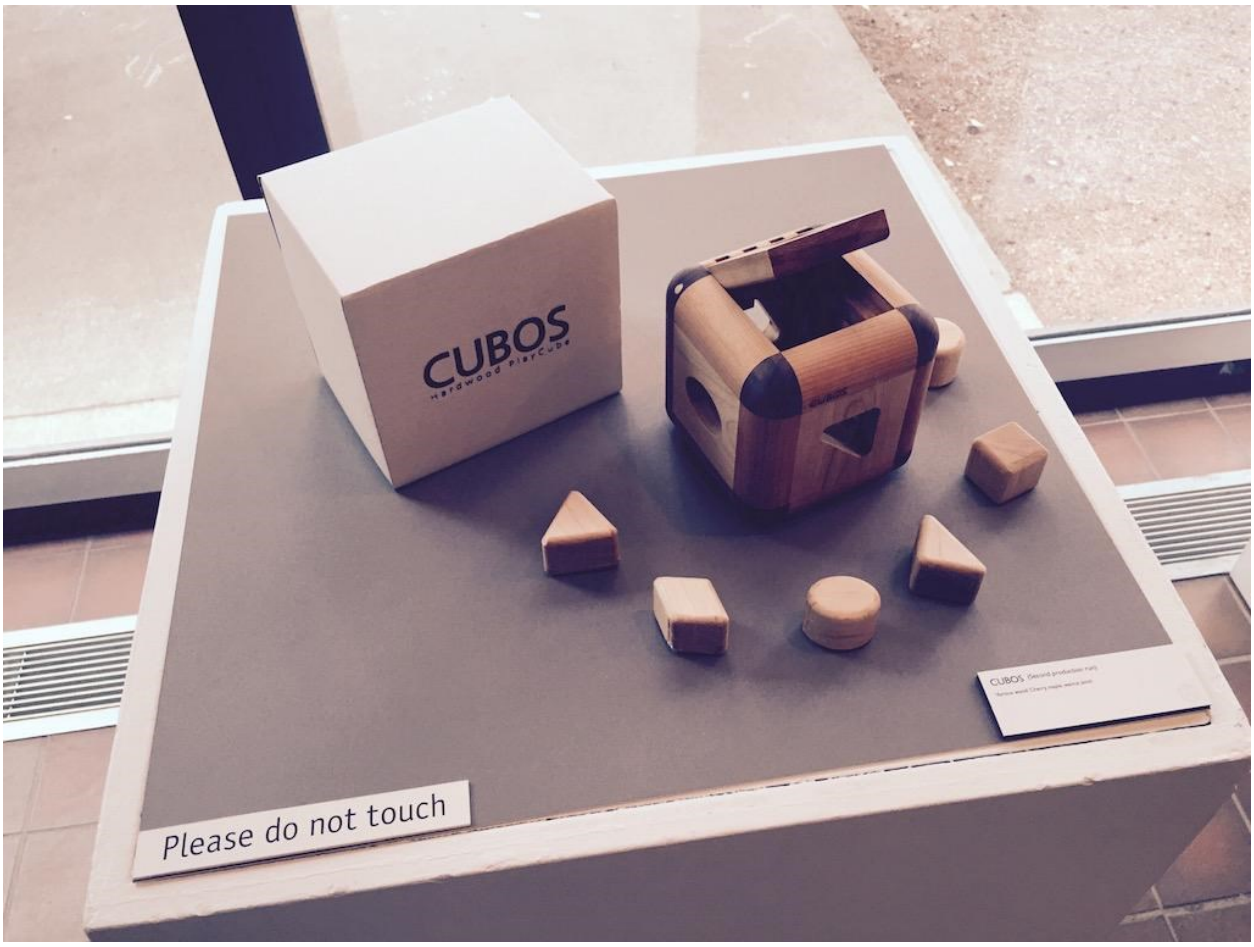
CUBOS Instagram

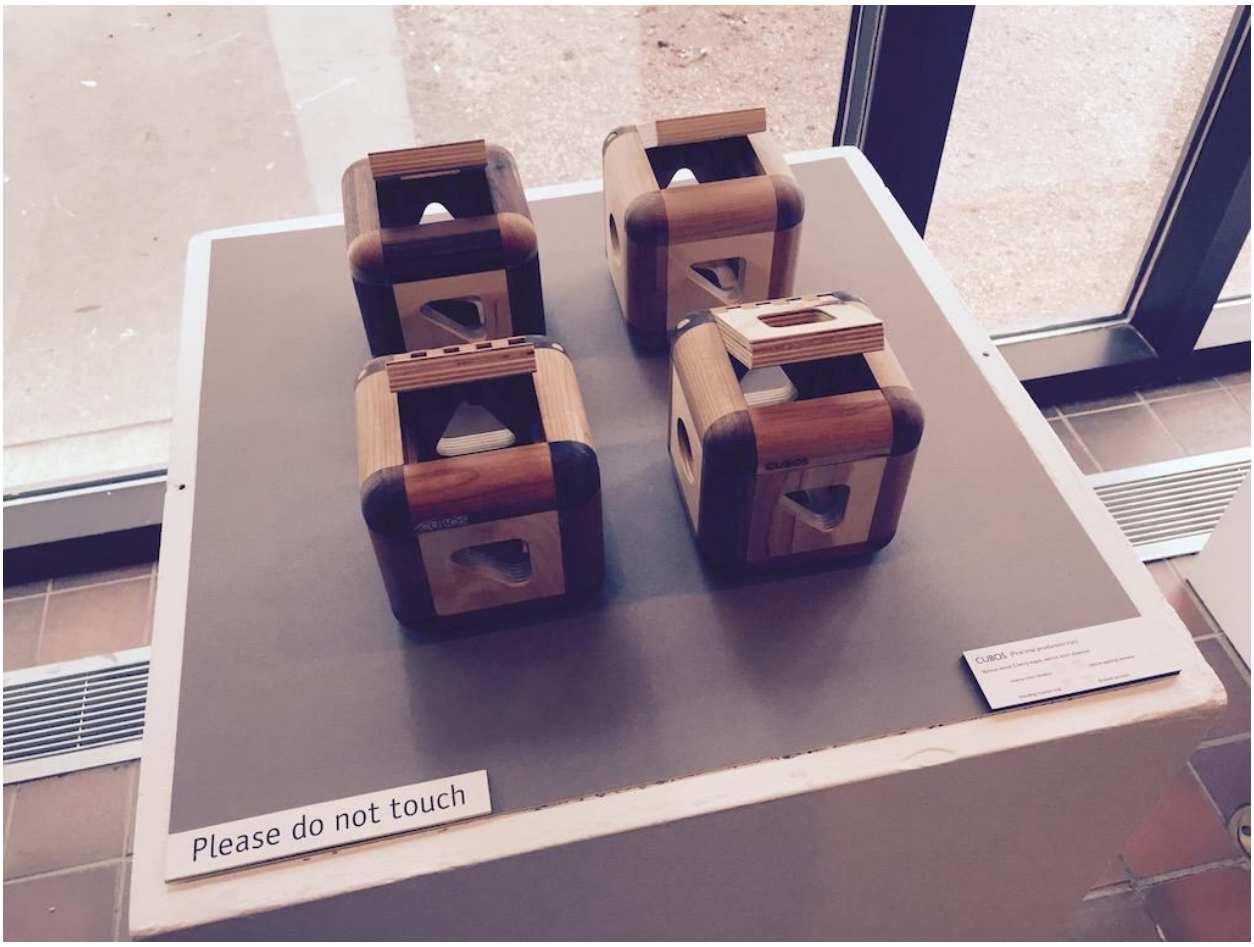
CUBOS Pinterest

Appendix-B: Master of Design graduate show

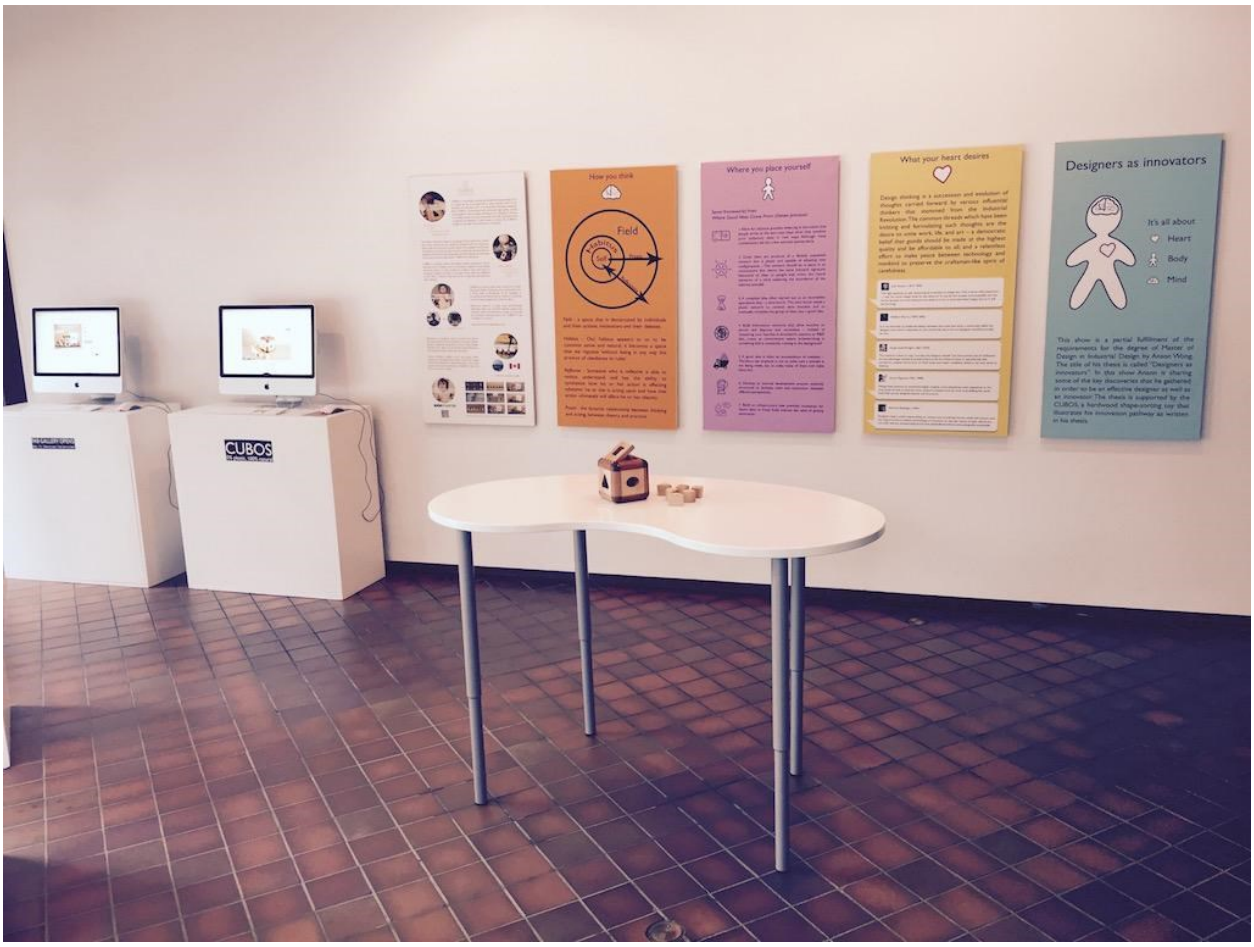



CUBOS


CUBOS
Please do not touch


Please do not touch

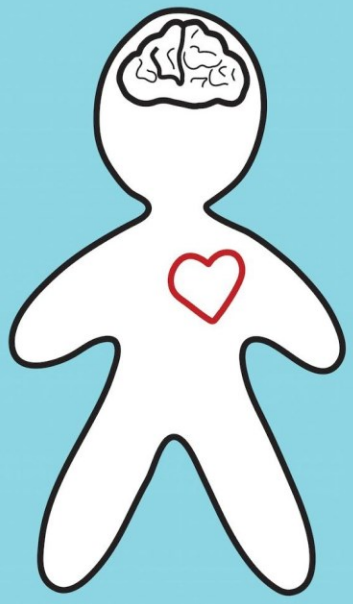

Please do not touch


How you think
Field
Where you place yourself
What your heart desires
Designers as innovators
It's all about
Heart
Body
Mind
CUBOS


CUBOS
0% plastic, 100% natural
FAB GALLERY OPENS
Mon - Fri : 10am to 5pm | Sat: 2pm to 5pm

Appendix-C: Master of Design graduate show panels

Designers as innovators



It's all about

Heart

Body

Mind

This show is a partial fulfillment of the requirements for the degree of Master of Design in Industrial Design by Anson Wong. The title of his thesis is called "Designers as innovators". In this show Anson is sharing some of the key discoveries that he gathered in order to be an effective designer as well as an innovator. The thesis is supported by the CUBOS, a hardwood shape-sorting toy that illustrates his innovation pathway as written in his thesis.

What your heart desires

Design thinking is a succession and evolution of thoughts carried forward by various influential thinkers that stemmed from the Industrial Revolution. The common threads which have been knitting and formulating such thoughts are the desire to unite work, life, and art – a democratic belief that goods should be made at the highest quality and be affordable to all; and a relentless effort to make peace between technology and mankind to preserve the craftsman-like spirit of carefulness.

John Ruskin (1819-1900)

The right question to ask, respecting all ornament, is simply this: Was it done with enjoyment — was the carver happy while he was about it? It may be the hardest work possible, and the harder because so much pleasure was taken in it: but it must have been happy too, or it will not be living.

William Morris (1834-1896)

It is not desirable to divide the labour between the artist and what is technically called the designer, and I think it desirable on the whole that the artist and designer should practically be one.

Frank Lloyd Wright (1867-1959)

The machine is here to stay" and that the designer should "use this normal tool of civilization to best advantage instead of prostituting it as he has hitherto done in reproducing with murderous ubiquity forms born of other times and other conditions which it can only serve to destroy.

Victor Papanek (1923-1998)

Design must become an innovative, highly creative, cross-disciplinary tool responsive to the true needs of men. It must be more research oriented, and we must stop defiling the earth itself with poorly designed objects and structures.

Hartmut Esslinger (1944-)

Designers have a social responsibility to connect and coordinate human needs and dreams with new opportunities in science, technology, and business, so that the results of their efforts are culturally relevant, economically productive, politically beneficial, and ecologically sustainable.

Where you place yourself

Seven frameworks from
Where Good Ideas Come From (Steven Johnson) :

1. Allow for adjacent possible, believing in the notion that people arrive at the best new ideas when they combine prior (adjacent) ideas in new ways. Although most combinations fail but a few succeed spectacularly.

2. Good ideas are products of a densely populated network that is plastic and capable of adopting new configurations – This network should be in place in an environment that shares the same network signature: Networks of ideas or people that mimic the neural networks of a mind exploring the boundaries of the adjacent possible.

3. A complete idea often started out as an incomplete speculative idea – a slow hunch. This slow hunch needs a plastic network to connect slow hunches and to eventually complete the group of ideas into a good idea.

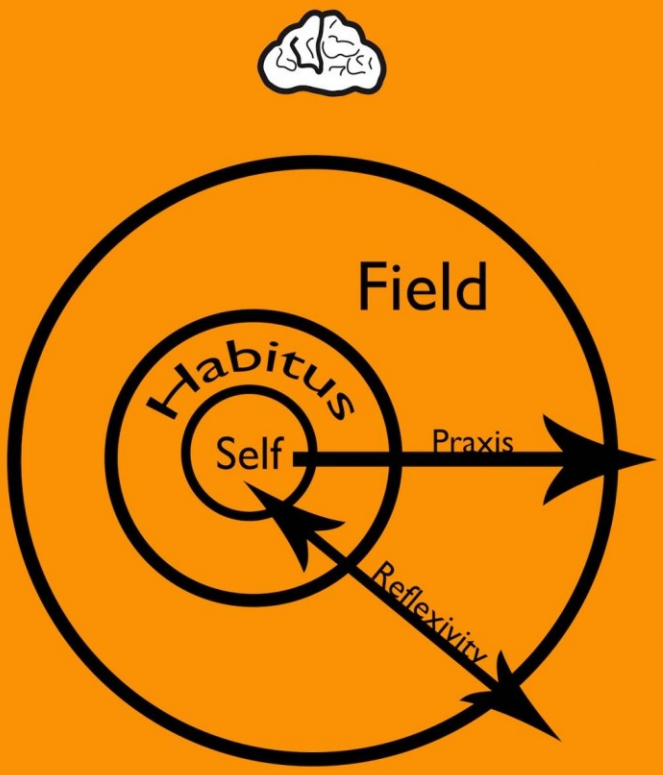
4. Build information networks that allow hunches to persist and disperse and recombine – Instead of cloistering your hunches in brainstorm sessions or R&D labs, create an environment where brainstorming is something that is constantly running in the background.

5. A good idea is often an accumulation of mistakes – Therefore the emphasis is not to make sure a mistake is not being made, but to make many of them and make them fast.

6. Develop an internal development process explicitly structured to facilitate clash and connection between different perspectives.

7. Build an infrastructure that provides incubation for future ideas to freely build without the need of getting permission.

How you think



Field - a space that is demarcated by individuals and their actions, institutions and their debates.

Habitus - Our habitus appears to us to be common sense and natural; it becomes a space that we regulate 'without being in any way the product of obedience to rules'.

Reflexive - Someone who is reflexive is able to notice, understand, and has the ability to synthesize how his or her action is affecting whatever he or she is acting upon and how that action ultimately will affect his or her identity.

Praxis - the dynamic relationship between thinking and acting, between theory and practice.

CUBOS
www.cubos.ca

CUBOS is a beautifully constructed hardwood shape-sorting toy. It is a great toy for a two-year-old, or even someone who is one hundred and two years old – It is the perfect life-long companion. Each CUBOS is constructed with extremely high quality woods, including Birch, Cherry, Maple, and Walnut. It is designed to be free of choking hazards and uses no harmful chemicals. Only glue holds it together, and Beewax is used to give it a shine. The CUBOS is designed to be safe, loved, and last for a long time.

-All hardwood
-No stain
-No harmful chemical
-Beeswax finish

We believe inspiration begin at young age. Those inspirations should stay and be carried into our adulthood. However with how things are being made and consumed today, it seems that people's limited baby toy options are to buy, use and consume things that will eventually be obsolete and thrown away. Along with the items that get thrown away, so are memories and inspirations. CUBOS is an alternative.

CUBOS is carefully crafted with highest quality hardwood, it has an aesthetic that is timeless and it is intended to appeal to both babies and adults alike. It is safe enough for a baby to play with and it is intriguing enough to be kept on an adult's work desk. The CUBOS is an item that is meant to stay and last for a long time, perhaps more than a lifetime.

-High quality
-Timeless appeal
-Long lasting
-Safe

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Anson Wong & co. Mcmurray interiors

CUBOS is a school project that turned into a 3 year long inquiry. After 2 iterations and 2 production runs, it finds itself at Kickstarter. If the campaign is successful, Anson Wong will be hands-on producing and personally manage the production effort.

Mcmurray interiors, a large local woodworking millwright shop, has provided feasible quotes and timelines which this Kickstarter is base on. They will be providing hardwood parts for CUBOS if the campaign is a success.

http://www.mcmurrayinteriors.com

Edmonton is a gorgeous winter city with over half of the year covered in snow. However it has been recently feature in National Geographic as one of "Top 10 Best Summer Trips". And I can personally testify Edmonton has the best Summer I have seen anywhere.

Home to Alberta Gallery of Art and many artistic endeavours including Royal Bison Craft Fair, Fringe Festival, The Works, Art walk. Edmonton is the fertile ground and reason for the idea of CUBOS to take root and nourish into a reality.

Edmonton, Alberta, canada

KICKSTARTER

CUBOS Kickstarter campaign is coincide with the duration of this show, which ends on 19th September, 2015