



Title	Maker movement in post-industrial Hong Kong
Author(s)	Wu, Wing-man
Citation	Wu, W.. (2016). Maker movement in post-industrial Hong Kong. (Thesis). University of Hong Kong, Pokfulam, Hong Kong SAR.
Issued Date	2016
URL	http://hdl.handle.net/10722/246716
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Maker Movement in Post-Industrial Hong Kong

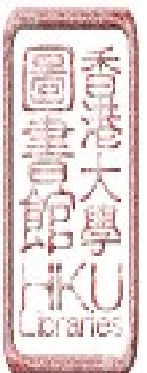
The Department of Sociology

The University of Hong Kong

Master of Social Sciences in Media, Culture and Creative Cities

SOCI8030 Capstone Project

Wu Wing Man



DECLARATION

I declare that I am the sole author of the research “Maker Movement in Post-Industrial Hong Kong” except as cited in reference. This research has not been submitted for a degree to any other University or Institution.



Student Signature: _____

Student Name: Wu Wing Man

Student Number: 3035158894

Date: 31st July 2016

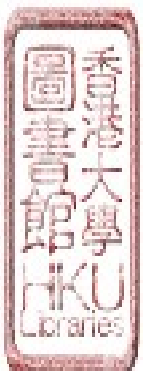
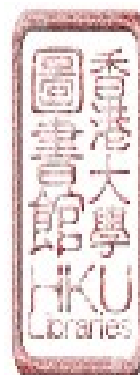


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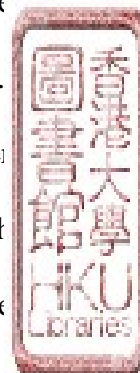


ABSTRACT

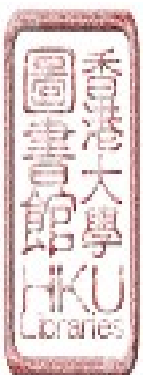
“Maker” is a concept originated from a course in Massachusetts Institute of Technology (MIT) in the United States in 2001. The original idea of this concept is to encourage people to make their own devices according to their needs, ideas and design. It is an extension of the DIY culture which aimed at making unique products in mass production market. This culture has been increasingly important in the design industry since then, and the trend is spreading around the world. Maker faire are being held in different countries, more people are interested in setting up the workshop for themselves as well as other makers. In Hong Kong, a group of makers are working on their own or has formed a space to gather the people with similar interest to work together. It is believed that the golden era for manufacturing industry in past decades of Hong Kong has a relation and contribution to this trend.

Manufacturing industry was once a leading industry in Hong Kong. Many people are working in factories for living, and they were equipped with related skills and knowledge. Starting from the end of 1980s, factories are relocated to mainland China due to low production cost. At the same time, Hong Kong has been wealthier than in compare to previous decades, and people are more willing to spend money for services and enjoyment. Service industry replaced manufacturing industry and changed the features of the society. When everyone believed that the industrial era of Hong Kong has become part of the history already, the existence of makers has proven that this era is still having influence on our society. Skills, crafts and spirit which were belongs to the era are left for next generation, and being used for creation of innovative products.

This research is conducted in collaboration with City Magazine as the Community Partner for this project. A total of five in-depth and semi-structure interviews had been conducted with Dust Production, FABcessories, Make Centre, Michael Young and oobject together with the

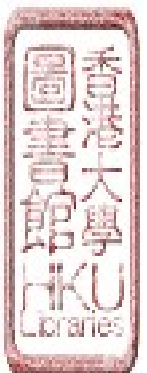


team from City Magazine in the week of 16 November 2015. Interviewees expressed their enthusiasm towards making unique products with personalized features and human touch which is incompatible with mass production. They have also shared the difficulties encountered by the makers in Hong Kong, and how they resolve those problems. This paper aimed at looking into the condition in nowadays and future development of maker movement in the post-industrial Hong Kong by engaging the theories of creative milieu and the relationship between men and machines.



ACKNOWLEDGEMENT

I would like to give my sincerest thanks to Dr. Gary WONG, my Capstone Project supervisor, for his guidance, patience, tolerance and encouragement along my research process. Thanks also to Nico and Alice from City Magazine, for giving me an opportunity in contributing to the cover story of the magazine in December 2015. The collaboration with City Magazine was indeed an enjoyable and memorable experience. My gratitude is also given to my colleagues and my supervisor at work, for their understanding and kind help during my study. I am also grateful for the emotional support from my family and friends in this two years time, especially Sonic, for his love and care. I will not be able to complete my study without their encouragement.



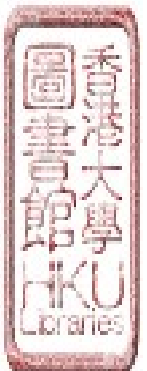
MAKER MOVEMENT IN POST-INDUSTRIAL HONG KONG

1. INTRODUCTION

1.1 Background on maker movement

Maker movement is a term emerges around fifteen years ago in the United States. It is being understood as an extension of the DIY (Do It Yourself) culture. The “involvement of digital media in the creation process” marked the difference between maker movement and DIY culture (Katterfeldt 2013).

Maker movement is originated from a popular course “How to Make (almost) Anything” taught by Neil Gershenfeld in Massachusetts Institute of Technology (MIT). The course was originally designed for advanced Physical Sciences students (Herrmann & Büching 2013, cited Turner 2010), but the course instructor later found out that only few of them from more than a hundred students are Physics students. Many of them are architects and designers who would like to “create things they’d always wanted, but that didn’t exist” (Herrmann & Büching 2013, cited Gershenfeld 2005). Students were able to complete the course by managing the design of devices, operating computer control machines and even build up the electricity circuit successfully. They also exchanged and disseminated their knowledge to those who are interested in making their own devices. Gershenfeld then established a similar workshop outside MIT in 2002 with all the hi-tech production machines provided, which enabled more people to get access to this culture and to be a maker. The “Fab Lab” (Fabrication Laboratory) is the term to describe this kind of space or workshop that provided machines such as 3D printer and laser cutter, as well as the space for makers to work on making their devices.

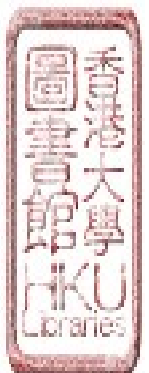


Gershenfeld's original idea to set up a Fab Lab is to facilitate the exchange of ideas and technical concept among makers instead of simply building up a hi-tech production laboratory. He sees this movement as “digital revolution” which could affect everyone's future. This idea could relate to the pre-industrialized past: “such a future really represents a return to our industrial roots, before art was separated from artisans, when production was done for individuals rather than the masses” (Herrmann & Büching 2013, cited Gershenfeld 2005). New technological future is developed in combine with the skills and craftsmanship from the old times. Through introducing products with personal fabrication that suits individuals' needs, it provides alternatives in the era dominated by the mass production. This is the where the concept of maker movement lies behind.

The trend has been spread to the world since then. Fab Labs has been established in over 78 countries with approximately 1,000 Fab Labs by now (FabFoundation 2016). Related conferences and researches have been constantly carried out. Maker Faire for makers to exhibit their products and exchanging ideas has become more common and important in design industries. In Hong Kong, Mini Maker Faire has been held in 2013 and 2014 by Hong Kong Polytechnic University. The Faire has been expended to a larger scale, and the first Maker Faire was held in November 2015 presented by the same institution.

1.2 Background on post-industrial Hong Kong

Manufacturing industry was the most important production section in Hong Kong from 1960s to early 1980s. At that time, many citizens are factory workers, the field of constructor

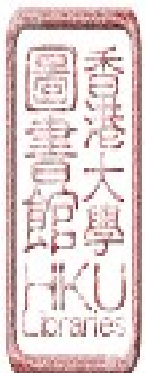


and clothing industry absorbed the most workers in Hong Kong. Around 50% of the population in Hong Kong is working in the manufacturing industry from 1960 to 1980 (Population Census – Summary Results). They all have equipped with skills and craft and work for their living.

In 1978, China has adopted the Open Door Policy that marked the beginning of economic reform in modern China. New policies including tax incentives were set to attract the foreign investment to set up their business in China. With huge amount of population and low production cost, China has quickly turned herself into “The World’s Factory”. Manufacturers in Hong Kong have also started to relocate their factories to China. Local skilled workers have no other choice but to find another job in the service industries, which has later replaced the manufacturing industry as the leading sector in economic development of the society. Hong Kong is then transformed to the post-industrial era.

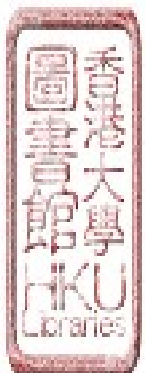
Daniel Bell (1973) has tried to summarize and describe the features of post-industrial society in his book “The Coming of Post-Industrial Society”. The features include:

- Provision of services replaced the production of goods as the main role in economic activities;
- Social Status of professional and skilled workers is being raised and valued;
- Knowledge becomes a valued capital in the society;
- Importance of technological development;
- Implementation of information sciences and technologies.



When looking into the current situation of Hong Kong, it is obvious that the society has already showing the features of a post-industrial society described by Bell. Percentage share of the population working in the service industries has reached 87.5% in 2011 (Population Census – Summary Results). To enhance the efficiency and to minimized the cost of manpower, application of information technologies to the services provided in different areas has also become more common.

Cheung (2015) mentioned that the abandoned industrial buildings are the proof of the declined manufacturing industry in Hong Kong. Those industrial buildings, where the spaces inside are relatively big for storage of machines and stocks, are representing the period of golden era in Hong Kong. After the factories were moved out, those spaces were abandoned and become a special speculation of Hong Kong. In recent years, the government had tried to “revitalized” those industrial buildings into other usage such as hotels, commercial buildings or creative spaces, which are all related to service industry. In fact, statistics on the development of service industry as well as the decline of manufacturing industry clearly shows that this is a irreversible trend for Hong Kong to transform into a post-industrial society. The percentage share of real GDP in Hong Kong contributed by service industry has been increased from 68.3% in 1980 to 85.8% in 1997, on a contrary, contribution from manufacturing industry has been decreased from 31.0% in 1980 to 13.9% in 1997 (Hong Kong Yearbook).

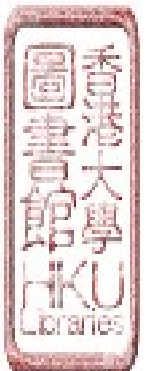


2. LITERATURE REVIEW

Creativity means breaking of the usual practice, normalized ideas or dominating ideology, and the emergence of maker movement is actually a creative way out from mass production. New ideas had been generated by combination of the traditional craft, skills and current technology. End of the industrial era in Hong Kong had greatly reduced the number of skilled workers, and with the incomparable low production cost of mainland China, the development of the society has changed to another direction after relocation of the local factories. We got used to the idea that machines could provide us with almost everything, and the skilled workers and crafters are redundant to the industry. However, as the mass production could only produce common and ordinary products, people started to find the way out of this boredom. In addition, since people are longing for something that really fit into their needs with personalized touch, they tried to think of the alternative way to make things happen. Relationship between men and machines are complicated as they are influencing with each other. Theories in relation to the above argument are as follows.

2.1 Nature of labour force before and after the emergence of machines

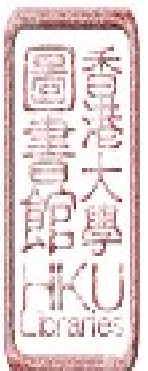
Invention of the machines has changed the nature of labour in the society. In ancient times, manufacturing was being carried out by crafters and skilled artisans. Apprenticeship was adopted for training on certain skills (Robben 2013). From the usage of raw materials, crafting process to the completed products, artisans are responsible for the whole process of manufacturing. They are able to make enhancement on the production process by their accumulated experiences. Invention of machinery has made manufacturing more efficient, but a



the same time it has also marked the beginning of the time when human jobs are being replaced by technology.

Machinery led to the emergence of Industrial Revolution in later centuries. Industrial Revolution and capitalism together has posed a great influence on the mode of production in society. Division of labour in the factories lead to the alienation of the produced products from the workers. Engineering intellectuals and industrial designers were appropriated by the capitalists, and the new relationship between the intellectuals and manual labour “shaped many cultural relations of the capitalist society” (Robben 2013, p.127). Since then the works that used to be done by ancient artisans has been cut off into different procedures, and labour are employed to be responsible for a single part instead of the whole process.

Using Hong Kong as an example, the history of the industrial era had demonstrated alienation in division of labour as well as the capitalist logic. The blue collars were being ordered to complete their duties at work, and they are not required to take care of other parts of production process. With lower production cost, their jobs were being replaced by other skilled workers in mainland China, and later by the advancement of technology. Machines have reduced the importance of skilled labour in manufacturing industry. Maker movement, on the other hand, has regained the important position of crafters and skilled workers in the production process. The movement has re-connected the machines with the people, and has shown the importance of such connection among them. Alienation of products from the workers is not the best method to produce perfect objects that suits human needs. Under this condition, maker movement has actually provided us a chance to rethink on the relationship between human and machines, and how to make the best out of this collaboration.



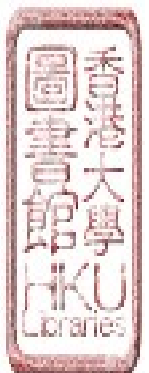
2.2 Creative milieu for maker movement

Charles Landry (2000) had mentioned about his thoughts on “creative milieu”, in which it could used to describe the favourable background for the emergence of maker movement:

“[creative milieu is] a place – either a cluster of buildings, a part of a city as a whole or a region – that contains the necessary preconditions in terms of ‘hard’ and ‘soft’ infrastructure to generate a flow of ideas and inventions. Such a milieu is a physical setting where a critical mass of entrepreneurs, intellectuals, social activists, artists, administrators, power brokers or students can operate in an open-minded, cosmopolitan context and where face to face interaction creates new ideas, artefacts, products, services and institutions and as a consequence contributes to economic success.” (p.133)

Landry has further clarify his definition on hard and soft ware as follows:

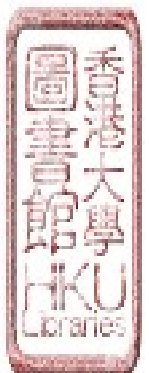
“‘Hard’ infrastructure is the nexus of buildings and institutions such as research institutes, education establishments, cultural facilities and other meeting places as well as support services such as transport, health and amenities. ‘Soft’ infrastructure is the system of associative structures and social networks, connections and human interactions, the underpins and encourages the flow of ideas between individuals and institutions”. (p.133)



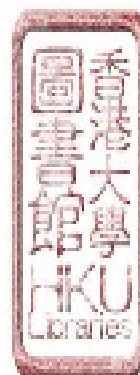
In the case of Hong Kong, hard ware and soft ware are not as perfect as Landry has expected and described. Most of the suggested hard wares are yet to be provided as shortage of buildings, facilities and places are the problems faced by all Hong Kong people. Hindrance is seen on the difficulties lie in the flow of ideas between individuals and institutions when cultural industry is not being truly valued. However, makers in Hong Kong are flexible enough and able to make use of the internet community which allows rapid interactions among social networks and human. They are also able to make relevant changes on the size of maker business according to the space they have.

On top of that, makers are able to add in the local elements in the production process to make it special when compare with the movement in the US. Although maker movement in Hong Kong is influenced by the trend from the US, the movement has been localized when the trend landed in Hong Kong. Limitations might have affected the scale of movement in this city, but it has also changed the nature of the movement and the maker mindset with these constrains. Elizabeth Currid (2007) has mentioned about the condition for creative milieu: “Creativity is fundamentally about generating new ideas and new forms, and much of this is dependent on new labor pools who bring forth fresh ways of interpreting the world” (p.13). New labour pool could be the makers from new generations with new ideas combined with traditional crafts, or other people who had generated new methods and skills through exchange of the ideas among individuals. Again, with the fundamental objectives of creating a hub for accumulation and distribution of maker experiences, maker movement could help in fostering creativity in different places.

David Gaunlett (2011) has also addressed the question of why everyday creativity is important to the society based on his observation of DIY culture. He thinks that people are

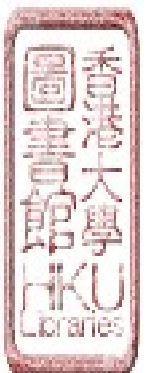


actively using the works produced by themselves to connect and communicate with others in the community instead of being a passive consumers. He also think that with the help from the internet, craft activities are no longer dominated by the professionals, as the amateurs could share their ideas and works through different online platforms. This has resulted in a shift from a sit-back-and-be-told culture” to a “making-and-doing culture” (Katterfeldt, Zeising and Lund 2013 cited Gaunlett 2011, p.245). What Currid and Gaunlett have said had echoed to the model of creative milieu mentioned by Charles Landry.



3. RESEARCH METHODOLOGY

This research is being conducted in collaboration with the City Magazine for the cover story in issue 471 which was published on 6 December 2015 with the title of “Designer-makers”. Five in-depth and semi-structured interviews were being conducted from 16 to 20 November 2015. The interviewees included Marco King Chan from Dust Production, Liyan Tai from FABcessories, practitioners from Make Centre, Michael Young and Gewah Lam from oobject. They are the industrial designers, manufacturers and makers who could provide comments and views as the insiders of the maker movement as well as the design and production industry. The list of interviewees was being discussed and come up together by the researcher with the City Magazine, and the magazine had initiated to contact the interviewees. The team from City Magazine includes the Managing Editor Ms Alice Leung and the In-house Photographer Mr Kei So. Each interview lasted for around 45 minutes to 1 hour. Consent from the interviewees were obtained for disclosing their identity in this report. Interview questions and the general direction of the cover story were also discussed with the City Magazine’s team before the interviews. Interview articles of Liyan Tai from FABcessories and the Make Centre written by the researcher were published in the magazine, which would also be the references for this research.



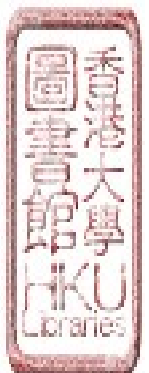
4. RESEARCH FINDINGS

4.1 Stories of the makers

4.1.1 Emergence of the makers in Hong Kong

All interviewees were not quite aware of the maker movement in Hong Kong, but they noticed that the trend is popular in some other countries such as United States and in Europe. When asked about how did they become a maker, all interviewees expressed that they do not have a clear intention to become one of them in the first place. They are just trying to do or make something with their own knowledge and tools they have on hands. They have great interest in doing so, and naturally they became one of the makers. Michael Young said in the interview that he has no choice but to do this job as he can only express himself creatively. In fact, interviewees like Liyan Tai who have studied design in Britain, Marco King Chan who have studied Industrial Design in Australia and Paris, and the artists / designers studied in local school from Make Centre have all equipped with design and craftsmanship from School before they become maker. Marco further mentioned that the 3D printing skills he has learnt from school is the combination of design and craftsmanship. Indeed, education is one of the important factors to decide the path they choose to take for their life, which has also provided a background for their imagination and creativity.

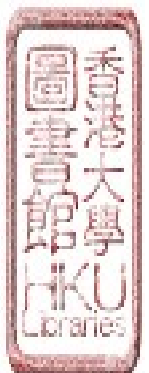
Some of the makers think that the industrial era of Hong Kong is more or less contributed to the maker movement in Hong Kong. Liyan Tai from FABcessories mentioned that most of the mothers know how to make clothes and sewing in their generation, as they used to work in the clothing factories for living. Kady from the Make Centre also mentioned the same phenomenon and further explained that the history of the industrial era in Hong Kong actually shows that the



society has already equipped with favourable factors to facilitate the maker movement in Hong Kong. The skills left by the mothers in the industrial eras could be one of the soft wares of a creative milieu.

4.1.2 Features of the makers

Back to the originality of where makers were emerges, the objectives for Gershenfeld to set up a FabLab is to “make fabrication technologies accessible for ‘almost everybody’” (Herrmann & Büching 2013, cited Gershenfeld 2005, p.ix). Hence, people with the required skills and is willing to make things on their own could be identified as a maker. They have to make things by their own hands, draw sketches, and surely they have to learn certain skills to work on the products. Unlike the mass production in factories, where division of labour and specialty of every workers are clearly identified, designers do not need to know how to solve the practical problems during the production process. Engineers, too, do not need to know how to make the appearance of the products more sellable in the market either, as they are just responsible for their own part. Interviewees like Liyan Tai from FABcessories and the practitioners from Make Centre had mentioned the problem as well, they think that it is quite common in today’s mass production method. With this reasons the mass production products could never be the best products for users. Makers, on the other hand, need to solve all the problems on their own. Liyan mentioned that to create ways to fix problems during the production process is what they do everyday; Kady from Make Centre said that “trial and error” is what they need to tackle all the time. Patience and insistence are the unquestionably the characters that makers need to equip when dealing with the constant failure. Just like other great inventors, if makers give up their projects easily, success will never come. Apart from this

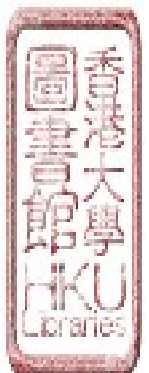


willpower, makers also need to be equipped by the craftsmanship skills, design knowledge and the basic ideas on engineering and technologies. With the above components, products with higher quality and personalized features could be done. The process of generating new ideas from trial and error with the knowledge on engineering or design is exactly the viewpoint of Elizabeth Currid who has mentioned on creative milieu.

4.2 Maker movement as the business

4.2.1 Individualistic product as the new trend

Products with personalized elements are becoming more popular in the market. In an ebook named “Impact of the Maker Movement” developed by Deloitte and the Maker Media, it analyzed the influence of the movement to the society in various aspects. It stated that “Access to tools, financing and community for Makers, combined with consumer demand for personalized, unique, and/or local goods may drive the emergence of a large number of Maker businesses and change the landscape of manufacturing” (2014). In fact, people started to realize that mass production products are actually making themselves an ordinary and common people walking along the street, and they need some products that could make them special and outstanding. That is why individualized products are having more demand in the market. Makers are fulfilling the needs of these people. Liyan Tai from FABcessories mentioned that to keep her product special and rare, she would only make ten to twenty pieces for each of her designed accessories. Taking even further, Marco King Chan from Dust Production foresee that “Mass Customization” could be adopted with 3D printing skills. He is confident that this strategy could make a little difference among every product they made, and believed that this is the brand’s future direction. Practitioners from Maker Centre also mentioned that people who

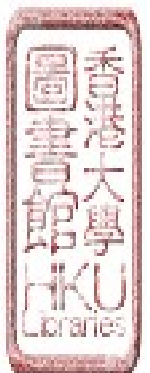


come to the workshop were aimed at making special accessories, decorations or presents for their friends, their house or for themselves. Only when making things by their own hands could make the products more unique. It could also differentiate them from those people who are using and wearing products purchased from department stores. Those products are more valued by the owners as well as it is not easy to be replaced.

In recent year, the online marketplace which sells handmade goods like esty with headquarter in US and DaWanda with headquarter in Germany are having more subscribers and their business are getting bigger. There is also a growing number of websites of crowdfunding for makers' projects, such as the Kickstarter, Indiegogo and Rockethub. The emergence of these websites reflected that more makers are engaged in this movement, and there are actual needs for the products with quality and personalized elements in the market. Makers could also have alternative ways to obtain economic capital to apply their ideas into real products. Further to this trend, customized products would be an essential service provided by the market, and will “consequently eroding the mass-produced portion of the market” (Impact of the Maker Movement 2014, p.16). This phenomenon is similar to what Currid and Gaunlett mentioned that the social network could help foster the creativity, and that craft activities are no longer dominated by the professional but are now involving anyone who are interested.

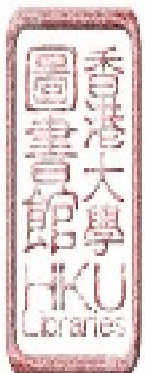
4.2.2 Importance of marketing strategies for the makers

Without many resources to promote their products, marketing strategies are even more crucial to maker business in compare with other businesses. Marco King Chan from Dus Production mentioned that for new and innovative technologies like 3D-printing, their



“marketing strategy” is to invent a language that explains the interesting elements inside such technique that could easily be understood by outsiders. People do not interested in the production process or how innovative the technologies and techniques are, all they wanted to know is what could be done by that and how they can utilize them to suit their needs. In order to attract the customers who have never heard about them, it is important to spread out the message and get attention from the public for the sustainability of their business. Interviewees mentioned that there are online platform like Pinkoi in Hong Kong that could be used for showcasing their products and to draw a certain group of supporters (such as Liyan Tai from FABcessories), or social media like Facebook to show their works and related activities (Make Centre and Dust Production).

Among different channels, the handcraft marketplace, which is very common in recent years, is agreed to be the most direct channel for the makers to meet with people with their own products. In fact, all of the makers seized chances to get exposure from different channels, but a physical one always got it’s own advantage. They all agreed that a shop or a store to showcase their products could really helped to promote their business. They were allowed to meet and talk to their customers in person to have more understanding of what they need. Liyan Tai from FABcessories rented a unit in PMQ as the showroom. She agreed that it would be better to have this kind of showroom as the online images are different from the real products, and the customers would be more interested to purchase the accessories if they can try it on. Marco King Chan from Dust Production also set up his showroom at the same place which is located downstairs of FABcessories. Marco told us that as he is not a marketing person, and the day when City Magazine interviewed with him, he had his marketing staff there to help explain about their mission and the real products in details. Similar to Marco, the marketing director of



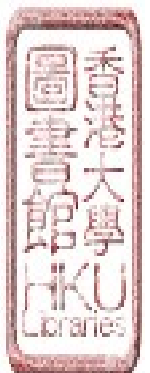
ooobject was also there throughout the interview and introduces their products. Most of the practitioners in Make Centre prefer to stay quiet during the interview, but they do have one member to be fully responsible for the marketing matters (Kady). She first used the Facebook as their main social platform to attract customers and audiences. They got the attention successfully that a number of television programmes and magazines interviewed with them, and their stories had been shared to the public. The Centre is now holding workshops regularly to teach people on making home furniture, stationery, storage boxes or accessories etc. with 3D printing, laser cut and skills of wood craft. The effort they have put on the social networks, connections and human interactions are all contributed to their business with economic success, which has described and forecasted by Landry on creative milieu. By doing so, the makers have gathered a group of people with same interest and contributed to the formation of a creative milieu.

4.3 Difficulties encountered by the makers in Hong Kong

To become a maker seems to be rewarding when looking at the finished products, or being recognized by the customers. However, to become a maker in Hong Kong is somehow challenging especially when they are dealing with various difficulties.

4.3.1 High maintenance fee for the machines and tools

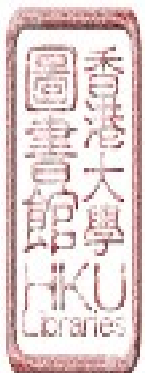
The FabLab could be served as the meeting places or support services that were considered to be the hard ware for creative milieu. However, like any other concepts and ideas there is always a downside that people need to be compromised or sacrificed for. Since makers are doing the digital fabrication in related to the usage of hi-tech tools and equipment maintenance cost for their machines and tools becomes a concern. Makers understand that those



techniques could bring to them a unique production experience that few other things can compare with, but there's a price for that. Natural worn out for the machines and tools are inevitable, and it's not easy to find the specialist to fix it. The cost for maintenance is not cheap either. In some cases, the price for buying a new machine or tool could be very close to the maintenance fee, which is almost a repurchasing process of the tools from time to time when malfunction of the machines happen. It's difficult for makers to bear the high maintenance cost, with other production costs such as material fees are yet to be mentioned. FabLab like Make Centre provides alternatives for makers to solve these problems. Renting the machines could facilitate the makers, and it could also help easing out the economic stress of the business.

4.3.2 Time cost for production

It is widely understand that mass production could largely reduce the production cost as it is able to maximize the number of products that could be produced within a short period of time. By doing so, manpower and the highly specialized division of labour are essential to the process. Makers, on a contrary, only have limited manpower resources, and they must tackle problems and handle all production process on their own. Hence, makers can only produce limited amount of products within weeks, months or even years, and that contributed to the high production cost of the movement. Master Leong from Make Centre shared his story as a woodcrafter who makes wooden furniture in Fotan sometimes ago. He used to make wooden cabinet in his studio. People were interested in his work and ordered for the customized cabinets from him. It takes him around one week to make one cabinet, and it spent him a month if he received four orders. Later Master Leong found that he has used up all his time for production of the cabinets for the customers, but do not have time to make things for himself. Apart from that, the money he

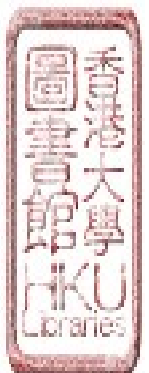


earned from the four orders can hardly support the rent he paid for the studio. Hence, he has given up the studio and joined the Make Centre in an industrial building in San Po Kong. He started to hold workshop, teaching the people on making the wooden furniture. By making this decision, he is now having some free time to design and make his own woodwork. To Master Leong, Maker Centre is a real nice place. Not only the place allows him to have some free time, but also allow people to build up social network, and creativity could then be generated. As a matter of fact, makers do need a meeting place and support services to avoid being alone, which could facilitate the exchange of ideas.

Time cost is the problem that every maker is tackling with, especially for those amateurs who have a full-time job, and can only pursue their interest in their spare time. Precisely because of that, the time invested in such production process as well as the quality with personalized touch cannot be produced by mass production. This is the feature that has made makers' products valuable in the market.

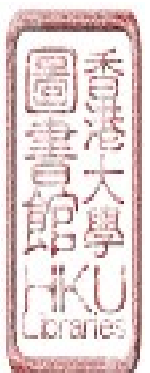
4.3.3 High rental rate for maker space

Hong Kong has been notorious for its' high rental price on real estates for years due to high demand and limited supply of rental space. According to Forbes' report in February 2016, Hong Kong, London, Beijing, New York and Shanghai, are the five most expensive cities in the world for office space. The report is based on the data collected from the real estate firm Jones Lang Lasalle (JLL), and it shows that the office rental price in Hong Kong topped the list that the rate is up to US\$262 per square foot. The report also highlighted that this price is almost doubled the rate of a comparable space in Shanghai (US\$136 per square foot), which is the fifth-ranked city (Sola 2016). If makers in Hong Kong needed space for their production, limited



choices on rental space is offered to them. Take Make Centre as the example, their workshop was originally located in Kwun Tong, and they were focus on seal carving (篆刻) and woodwork. They were doing limited number of laser cut products only. Later when they decided to do more work on home decorations and furniture, they realized that a bigger space for their workshop is needed for the machines and the wood crafting work. Hence they moved to the current studio at San Po Kong for a bigger space as well as the cheaper rental price.

As mentioned earlier in this report, the original idea for maker movement is to foster the communication of ideas among makers. Space is important for the machines as well as gathering people for ideas exchanging and communication, which echoes to Landry's suggestion on the features of creative milieu. Practitioners in Make Centre told us that makers in Hong Kong have accepted and get used to the inadequate area, and those spaces are not affordable for them. If they would like to carry on their business, they have to think of alternative ways to sustain their business. It somehow shows that makers in Hong Kong are determined as they need to sort out various difficulties on their own if they need to carry on their businesses and works.



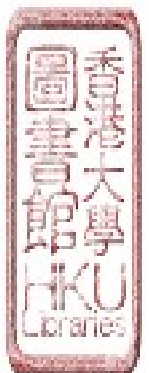
5. ANALYSIS AND DISCUSSIONS

5.1 Maker movement – The third industrial revolution

There is a long history for Industrial Revolution. The invention of steam power and the textile machinery has contributed to the First Industrial Revolution in 19th century. The production started to involve steel, railroads and chemicals together with the electricity in later years, which has brought the mass production to a more advanced level, and led to the Second Industrial Revolution in 20th century (Robben 2013). The Third Industrial Revolution is based on the emergence and application of information technologies in manufacturing process, which describes the current situation in the world. Unlike the previous Industrial Revolutions where mass production is emphasized, flexible production is the new trend in the Third Revolution. Flexible production could be considered as the progress based on the development of mass production. It had eliminated the defects of mass production where the products are singular and not fitting into individual needs. Emergence of maker movement helped filling in the gap throughout the transformation from mass production to flexible production. It has promoted the advantages of producing unique products that mass production is incomparable with, it has also makes us rethink on the value of the skilled workers and craftsmanship. Below we shall look into the features of the Third Industrial Revolution by using Hong Kong as an example.

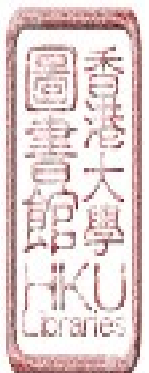
5.1.1 Scale of the modern factories

To many people, production simply means factories and manpower. Production requires large space for machines and labour to work inside. This is to ensure that the efficiency of the production is being maximized. When evaluating the scale of the certain business, number of



factories and the people they have employed are always one of the important indicators. But for today, these might not be case, as makers in Hong Kong is flexible enough to utilize their limited resources in hand for their maker business. They understood their limitations and restrains according to the social condition, and they are able to figure out the alternatives to solve the problems they have encountered. For example, there are laser cutting tools or 3D printing machines in different sizes that suit the needs of different people, and some of the makers could make products at home.

In fact, the techniques on digital manufacturing have been highly developed and established which could only used up limited production space, time and cost by simplifying the steps of planning, trials and materials testing. Digital prototyping is now able “to gives conceptual design, engineering, manufacturing, and sales and marketing departments the ability to virtually explore a complete product before it is built” (Robben 2013, p.135). This could reduce the time for making and testing on trial products as computers have already made calculations in advance. Furthermore, this technology allows us to “manufacture almost any shape that designers come up with, because they are no longer constrained by the necessity to produce parts in molds. New and exotic materials become available to manufacturing processes”. With the help of this innovative skill, it “opens up pool of possibilities for low and medium volume manufacturing” by “elimination of tooling” (Robben 2013, p.135). The report “Impact of the Maker Movement” developed by Deloitte Center for the Edge and Maker Media from the Maker Impact Summit (2013) also mentioned the potential impact on manufacturing industry “This new era of manufacturing will include geographically distributed small-run manufacturing and will tale some share from current centralized large-scale manufacturing” (2013, p.16) Similar to Robben has mentioned, the report also stated that “greater access to technology-aidec

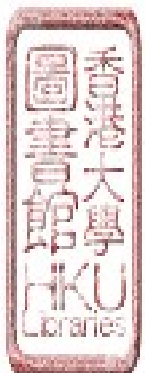


and industrial graded tools either at home, at local Maker spaces, or through commercial service bureaus allow Makers to experiment with new materials, structures and products” (p.16).

Although interviewees like Michael Young, Liyan Tai and the practitioners in Maker Centre mentioned that they are still making real trial products to ensure that they are practical enough for usage, the space and tools they need is actually more flexible in compare with the factories in the old days. They could choose their production scale according their existing resources. Marco King Chan has already set up an example that digital prototyping are the future in the industry. From sketching the products to printing it out by the 3D printers, they were all made in the small shop located in PMQ in Central District of Hong Kong. Digitalization in the manufacturing industry has undoubtedly changed the landscape of production in this sense.

5.1.2 From mass production to personalized products

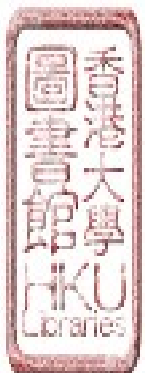
Hong Kong has been transformed from a industrialized society into a international city with economic power in recent decades. Before that, the lives of our previous generation in Hong Kong were comparatively simple, they worked from day to night and then went home for dinner with families; they worked hard for living and for better future for their offspring. When the society become wealthier, living standard of the city is also getting higher. Various surveys showed that the cost of living in Hong Kong has been increasing over the years, and by 2015 it had ranked the 9th on the list of most expensive cities in the world, which barely ranked behind the world’s cities like Copenhagen and Geneva (World Cost of Living 2015). Today people have obtained sufficient capital for quality of life, and they care about the services provided to them. To feel special and unique is what they are looking for, as people always wanted to be differentiate themselves from others.



According to a press release from Deloitte, a business advisory firm, “mass personalization” is the new king of the all industries. A research conducted by them shows that 36% of the customers are interested in personalized products and services, by that it means one in three customers wants this service. The press release has also commented that the business should take their step further to “link their processes and resources” to provide the personalized services, or they will “risk losing revenue and customer loyalty over the longer term” (Deloitte 2015). It has also mentioned about the trend of 3D printing in the content: “Flexible manufacturing and 3D printing enable mass personalisation at lower costs, allowing manufacturers to rethink their supply chains radically” (Deloitte 2015). This echoed with the statement made by Marco King Chan in the interview. Also, as analyzed by Bernard Robben from University of Bremen, an expertise in Computing in Social science, digital prototyping could help in bringing this new service to the mass. He said, “without the cost of tooling to amortize into the parts produced, each component can be different, potentially allowing for true mass customization of every product” (Robben 2013, p.135). All these had provided favourable factors as the condition for creative milieu as mentioned by Charles Landry, in which it could draw more people to join the movement with easy operation tools and low production cost.

Hong Kong has also aware of this trend. In an article published by Hong Kong Trade and Development Council (HKTDC), it has the following descriptions on latest trend on clothing products in Hong Kong:

“The growth of technology allows consumers to search the internet and find a way to create their own custom made outfits. This is the modern way to express their creativity on making their own fashion designs and clothes. In response, some

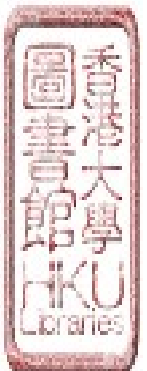


reputable clothing stores like Nike, Adidas, and Wal-Mart have started to sell personalised apparel, while companies in smaller business allow consumers to customise clothes and accessories with their own design online.” (Clothing Industry in Hong Kong 2016)

The above description made by HKTDC has fully reflected the trading environment in the Hong Kong contributed by the advancement of technology. Apart from searching the information for the clothing trend on the internet that suits themselves, people could now started to customize their own outfit and submit the related information to the manufacturer. It has again proven that mass production products cannot satisfy the demand from market, and personalization in marketing is the new trend.

5.1.3 Labour force in maker movement

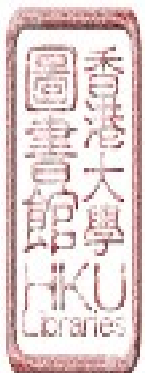
As mentioned in the introduction, Daniel Bell (1973) predicted that in post-industrial society, manufacturing industries would be replaced by the service industry. It is noticeable that the human jobs are being steadily replaced by the computerized systems. Bernard Robben said that the “production of material products needs less blue-collar employees. New science-based industries emerge, which need new technical elites. The digital network is the sphere where the spatial and temporal globalization of labor is made possible” (2013, p. 134). Human workforce are replaced by the advancement of technology, and as the machinery is now able to imitate the human actions during the production process, “technical elites” are becoming more important in today’s society as they plays the decisive roles. Bernard Robben further expressed his pessimistic views on global labor that it is “the endless recombination of myriad of fragments



that produce, elaborate, distribute, and decode signs and informal units of all sorts. Labor has become the cellular activity where the network activates an endless recombination” (p.134).

Many countries have already noticed on this impact. According to a recent survey, technological advancement and the digitization in the workplace have great influence on workers who are seeking to match their skill sets with the needs of employers. Only around 45% of workers believed that they have equipped with the skills which is able to cope with the new mode of production. The shortage of skilled workers was even more common in manufacturing sector. The report has suggested that the employees has to develop new skills of themselves that “give them the edge over machines”, such as critical thinking and creativity (Hallett 2016). This development in manufacturing industry is similar to vision predicted by Daniel Bell in his book “The Coming of Post-Industrial Society” (1973).

The emergence of maker movement is actually providing a buffer zone for the disappearing traditional skills and craft and somehow pulling them back on the track. When mass production does not need skilled workers, maker market might be their alternatives. Just as the case with Maker Centre, the demand of crafters or designers for the co-working space is getting higher, because they could enhance the ideas exchange on maker products. In the co-worker space, the computers or machines cannot replace their ideas and experiences, as it is only human who are able to discuss, do research and make improvement on their skills. Even though the future of manufacturing industry is believed to be more digitalize that could replace more human jobs, still they are not able to estimate human needs and thinking accurately. Makers are making their products according to their own experience and human needs, and human brains are needed here to perform critical thinking and creativity on the mode of production. Computers will need to absorb human experiences before programming and analyzing on their next steps



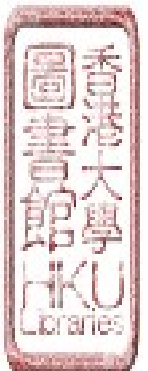
Crafters and skilled workers are essential for maker industry, and there they could not be replaced easily.

5.2 Future development in Hong Kong

5.2.1 “Everybody is a maker now”

Many people are making a statement that “everybody is a maker now”. Dale Dougherty, the founder of MAKE magazine and the creator of maker festival “Maker Faire”, as well as Bre Pettis, the cofounder of Makerbot, the renowned American company that produce 3D printers, stated that with the popularity of open source and their knowledge of certain tools, everybody could be the makers. Chris Anderson, the author of “Makers – The New Industrial revolution”, and also commented that “the distinction between amateur and entrepreneur has been reduced to software options” (2012). People in the field are so confident that maker movement would be a new industrial revolution from grass-root level.

The situation in Hong Kong might not be as optimistic as they do. Strains for potential makers in Hong Kong are obvious. As discussed in the difficulties encountered by the makers, production cost in Hong Kong is very high. Cost of manpower and the rent of space are all hindrances of maker business. The maker community in Hong Kong is not mature enough for the makers to exchange and enhance their products either. However, the flexibility of maker movement could allow and encourage many people to at least give it a try. With accessible tools and methods, and with the help of social media, they could operate the tools on their own. It is even easier for them to do so with the help from computer prototyping. In future, as the practice of share studios, equipment and tools will be more common, the cost of production in maker movement will become lower according to the law of market. Since production technique of

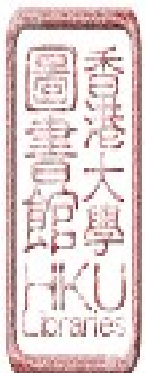


laser cutter and 3D printing tools has become more mature, the cost for maintenance is expected to be reduced in years. All these conditions could draw attention and attraction for those who “need to engage passionately with objects in ways that make them more than just consumers” (Dougherty 2012).

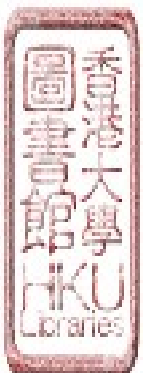
5.2.2 Future trend in design industry

Maker movement had made great impact on the design industry. Their culture of making-do by every tools and equipment in hands, together with their spirit of trial and errors, had set an example for the current designers to-be in Hong Kong. As mentioned by makers in the interviews, many designers tend to care about the appearance of their products only. What they truly concerned is that if the products are beautiful enough to attract audience or customers, but ignored the practicability of the products. However, the best products must be done by the thorough research and understanding on every parts of the products. Just as commented by Neil Gershenfeld, “communication between machines, like that between people, requires some common understanding and some civility, and frequent entails some compromise” (Gershenfeld 2011, p.285). Both designers and makers should accept that there are always limitations in the production process, and they need to keep trying and testing on the products to find out the defects in order to sort things out. After all, problem solving is and will always be the most desired skills from every industry.

According to the analysis in previous session, it is clear that the “mass personalization” would possibly become the dominating marketing strategy. It will be a challenge for the manufacturers to keep balance between the production cost and the personalized service of their business. Quality and uniqueness of the products are equally importance in business planning

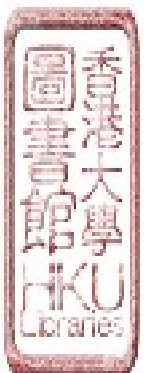


and by that it could further reduce the barriers between the labour force and the engineering intelligence. Since the coming of Fourth industrial revolution is building on the Third industrial revolution, it would be blurring the lines between the “physical, digital, and biological spheres” (Schwab 2016). Alienation of products from the workers is expected to be minimizing in manufacturing industry. It is foreseeable that automation will be everywhere in a decade or less, and the design and engineering industry will need to rely and utilize the new inventions to make improvement on products. Here maker movement could be served as the research and back up team in enhancement of mass production products in future production.



6. LIMITATIONS

Since this research is being conducted in collaboration with City Magazine, it was understood by both parties that the interviews were expected to publish in the magazine. Hence, when answering some sensitive questions regarding the current government policies, interviewees tended to avoid providing answers that might cause consequences to them. Most of the interviewees were only willing to provide brief answers, and one of the interviewee even refused to answer one to two interview questions regarding the topic. This has hindered the researcher to understand the comment from the interviewees on the actual influence of government policies to the movement. However, as the research is mainly focus on the development of maker movement in Hong Kong instead of the discussion of government policy making, the effect on the research results is therefore limited.

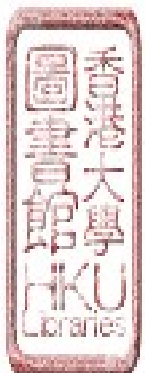


7. CONCLUSION

Machines had played an important role in the history, including the industrial era in Hong Kong and the current maker movement. The nature of the labour force seemed to have varied according to the usage of the machines: large labour force is originally needed for operation of the machines, but later the human jobs are being replaced by the technology. Emergence of maker movement has provided a vision and confidence for us that skilled labour and crafter will become important again in the production process, as human hands and brains are not replaceable by the machines.

The nature of maker movement in Hong Kong is somehow different from the objectives when the culture was first appears in the US. Makers in Hong Kong do not have much space for their production, and they do not have much support from the society. All they could do is to make the best out of the resources they have, and tried to gather the group of people with same interest by social networks. Despite all these constraints, the makers in Hong Kong are still able to manage to sustain their interest and hobbies, and create their own maker business with the asset and skills left from the previous generation. In view of that, those constraints could be served as facilitator for generation of creativity, for people could always initiate alternatives based on the limitations, and this could align with the conditions mentioned by Charles Landry on the creative milieu.

Indeed, the stories of the makers in Hong Kong showed determination is important for them to be able to transform their failure into experiences and to accumulate their knowledge for future success. At the same time, it has developed the makers' unique characters and features in this movement, which allow them to cope with challenges in today's Hong Kong.



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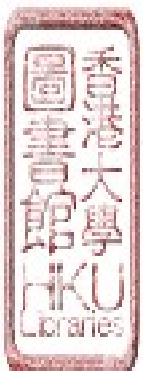
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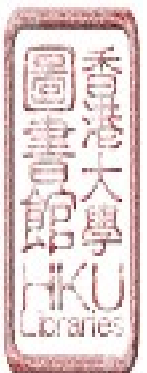
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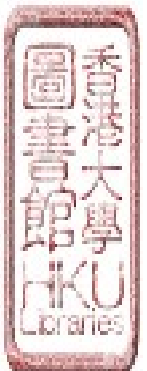
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