

Research Assessment Exercise 2020
Impact Case Study

University: The Hong Kong Polytechnic University (PolyU)

Unit of Assessment (UoA): 38 visual arts, design, creative media, other creative arts and creative writing

Title of case study: Transforming Design Management Capability in the Manufacturing Industry and Influencing National Design Policy in Mainland China

(1) Summary of the impact

PolyU's research programme on design management capability has influenced China's two main innovation policies at national level: the Innovation Design section of *Made in China 2025* (published in 2015), and the 2016 *Action Plan for Digital Creative Industries* in the 13th Five Year Plan, with related industry guides for disseminated to every province. Our research also introduced new business models helping transform two Guangdong companies, *Shangpin* and *Victory*, from traditional SMEs to top brands in China's furniture industry. *Shangpin's* annual sales revenue increased by over 400% and now stands at over HK\$ 7 billion. *Victory* boosted sales revenue by 70% in the relevant part of its business and has become one of China's Top Ten office furniture brands.

(2) Underpinning research

Background and initial research

Design management combines design operations, as well as organizational and strategic management, with a company's long-term objectives. Initiated in the UK and Japan, design management has boosted the competitive advantages and innovation performance of firms, industries and nations (such as the USA). Prof John Heskett (PolyU, 2007-2012), as a design policy advisor to the UK, Japan and the U.S.A., believed that China would be the next country to apply design management to improve competitiveness. However, even after the design management concept was introduced to China around 2000, it was limited to theoretical concepts borrowed from the West without a holistic understanding of its possible application in Chinese industries. To bridge this gap, a study on design management in the Chinese manufacturing industry was conducted by Prof. John Heskett, author of the Hong Kong Design Task Force, and Dr. Xihui Liu (PolyU, 2007 to present), previously the director of a leading Chinese design consultancy. Their research aimed to describe and define design management in the Chinese manufacturing industry, thereby guiding businesses to upgrade from manufacturers to brand owners.

Through building a database of how design is managed in Chinese manufacturing industries, a **design management capability (DMC)** six factor framework was reported in the team's initial 2012 findings. This was the first empirical study on this topic in China. Unlike previous models of design maturity, which normally divide design levels through vague descriptions based on a limited number of case studies, PolyU's DMC research was conducted through employing mixed methods consisting of around 50 case studies and extensive quantitative data collected from 330 manufacturers in the Yangtze River Delta and Pearl River Delta, two leading economic areas [1].

Further design management capability (DMC) research

Dr Liu has continually developed this DMC research as a longitudinal study, adjusting the research direction to explore a new framework of *dynamic DMC* to suit the dynamic business environment of the knowledge economy. This new DMC concept transforms the traditional view of design being just the ability of a professional designer or team, into DMC of design leaders and managers. Dr

Liu's new frame explores the future role of design management, to maximize the dynamic capability of both existing and new companies. PolyU helped build an inter-disciplinary and inter-university research team to study the basic theories for the new dynamic DMC, including: 1) applying DMC for disruptive innovation throughout the business ecosystem; 2) exploring how to build DMC in startups; 3) establishing key factors for a new dynamic DMC framework, and 4) identifying demands for DMC from the industry perspective of design leaders and managers [2, 3, 4].

Research to inform national level Innovation Design policy

Our initial and ongoing research outcomes of DMC have continually contributed to a series of design policies in mainland China and Hong Kong over the last six years. Before 2015, there was neither national design policy especially for the manufacturing industry, nor policy promoting design and innovation that embraced the knowledge economy in China. As a result of PolyU's DMC research, Mr. Yanmin Zhang, the executive vice chairman of the *Chinese Mechanical Engineering Society* (CMES) and *Strategic Research on Innovation Design* project leader, invited our research team in 2013 to join his project. The *Strategic Research on Innovation Design* project, funded by the *Chinese Academy of Engineering* (CAE), was designed to undertake further research and to provide input into government innovation design policy. Our DMC framework was used to explore the new role and scope of design in the knowledge economy as well as define the scope of innovation design and its development path [5]. This project was the first of three where PolyU's DMC research contributed to national level policies. It was followed by the *Digital Creative Industry (2016-2017)*, which defined the basic structure of the Chinese Digital Creative Industry (DCI); and *Manufacturing Collaboration in One Belt One Road (OBOR) (2017-2019)*, which manages the collaboration quality through an evaluation system built based on our DMC framework. Over 21 academic papers have been published based on PolyU DMC research.

(3) References to the research

PolyU researchers shown in bold.

- [1] **Heskett, John** and **Liu, Xihui** (2012) Models of developing design capacity: perspective from China, *Proceedings of the DMI 2012 International Research Conference*, Edited by E. Bohemia, J. Liedtka and A. Rieple, August 8-9 2012, Boston, USA.:225-238.
- [2] Rieple, Alison and **Liu, Xihui** (2018) The construction of Xiaomi's innovation ecosystem, *European Academy of Management (EURAM) 2018 Conference*, Iceland.
- [3] **Liu, Xihui** and **de Bont, Cees** (2017) Barriers to Strategic Design: A Perspective from China, *She Ji: The Journal of Design, Economics, and Innovation*, 3(2), 133-145. doi.org/10.1016/j.sheji.2017.09.003;
- [4] **de Bont, Cees** and **Liu, Xihui** (2017) Breakthrough Innovation through Design Education: Perspectives of Design-Led Innovators, *Design Issues*, 33(2): 18-30. doi.org/10.1162/DESI_a_00437
- [5] **Liu, Xihui** (2016), Innovation Design: Made in China 2025. *Design Management Review*, 27(1): 52–58. doi: 10.1111/drev.10349

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(4) Details of the impact

Policy impacts: Incorporating design management capability into national industry policy

The key result of the CAE funded study *Strategic Research on Innovation Design* (Jul 2013- Jun 2015) was a **policy suggestion**, based on DMC research, to transform design's role from cosmetically adding value through styling to fundamentally leading the product development

process in the Chinese manufacturing industry. In Jan 2015, this policy suggestion was passed by CAE to the Central Government and then approved by President Xi Jinping. **The content was included in *Made in China 2025* (2015, No.28)**, which was officially released by the State Council of China on 8th May 2015 [A, B]. *Made in China 2025* was the 1st ten-year national strategy for upgrading Chinese manufacturing innovation capability, especially in equipment manufacturing and intelligent manufacturing, which both contribute 30% of China's GDP. *Made in China 2025* was adopted by domestic cities and resulted in the creation of five national and 48 provincial innovation manufacturing centers [C]. The overall policy had a significant impact on Chinese industry with the target of upgrading their position in the global value chain.

Dr Liu was asked by CMES to **draft policy guidelines for industry** on *how* to implement the innovation design policies from *Made in China 2025*. This report was released by the Ministry of Industry and Information Technology (MIIT), National Development and Reform Commission, and Chinese Academy of Engineering, entitled *Guide on Developing Service-based Manufacturing* (2016, No.231) in July 2016 [B]. Distributed to all manufacturing companies across China, CMES' Executive Vice Chairman confirms "*[It] has been hugely influential in the sector. It is particularly useful because it has supported individual companies to transform and upgrade their current manufacturing-dominated business to the new one integrating service*" [B]. A book, *Innovation Design for Manufacturing Industry* was also published in 2017 to explain the policy content and guide the practice of industrial leaders. Dr. Liu is on the editorial committee and is the leading editor of Chapter 4 &5. The first 2000 books were sold out within a few months.

PolyU's updated DMC research was embraced by the government to develop other national strategies around *Digital Creative Industries* (DCI), and the *One Belt One Road* initiative. In 2016, to achieve the aim of generating RMB 8000 billion GDP through DCI by 2020, as stated in the *13th Five-year Plan of Strategic Emerging Industries (2016-2020)*, our new dynamic DMC concepts were used to explore a growth path [B]. In the study on manufacturing collaboration as part of the Chinese Government's One Belt One Road (OBOR) initiative in 2017, the new concept of a dynamic DMC system was suggested as a basic guideline to evaluate the quality of international collaborations, products and stakeholders [B].

Economic impacts: Transforming design thinking in traditional manufacturing firms

In the early 2010s, the Guangdong government were seeking ways to transform their increasingly economically unviable, high-pollution, high-waste and low-technology furniture industry. Aware of PolyU research from the original Pearl River Delta study, Mr. Qizhi Hu, the chairman of *Guangdong Industrial Design Association*, invited our PolyU research team to select two SMEs as case studies and ignite innovation using the DMC framework.

A first test case was carried out with *Shangpin*, a home furniture firm. Working with *Shangpin* (Dec 2011-Dec 2012), the PolyU team developed a new business model [D]. This new business plan won an award in Dec 2012, its recommendations were introduced throughout 2012 and 2013, with PolyU continuing to provide informal support until 2014. The full impact of this new approach was realized from 2014 onwards, when sales revenue increased substantially. By 2017, *Shangpin* was **listed on the China stock market**, and by 2018, **annual sales had increased by over 400%** to reach RMB 6.6 billion (HK\$7.33 billion) [E], up from RMB 1.17 billion in 2013 [F].

This transformation was made possible through applying new technologies and design thinking based on PolyU's DMC models. PolyU researchers led *Shangpin* through the process of building a new '*full-house customization*' business model - a new production approach enabling **customers to buy direct from the manufacturer, benefiting from rapid delivery of customized products at mass-production prices**. Mainstream and professional media in China, such as *Sina*, *Harvard Business Review* etc. [G] quickly took note of this highly innovative and significant development

for customers ensuring that this new business model became well-known. Today, many home furniture firms use this ‘*full-house customization*’ approach [H], including leading brands such as Oubon, Oppein, Holike and Lovica.

Our new business model for *Shangpin*’s improved performance of the has increased daily production capacity 10-fold, decreased the error ratio from 30% to below 3%, shortened the delivery cycle from 30 days to around 10 days, increased material utilization from 85% to more than 90%, improved the capital turnover rate from 2~3 times to 10 times per year, and requires zero stock storage [G]. PolyU’s DMC model and the new dynamic DMC concept were applied to the business model through transforming supply chain relationships into a business ecosystem for co-creation, elevating design as leading the new business and as a core competitive advantage.

Our second test case involved working with *Victory Office System Holding (Victory)*, an office furniture firm from November 2013 to November 2014. *Victory*’s CEO describes how “*through reviewing our existing resources, innovation capability and business strategy, [the PolyU team] suggested a business model of offering a total design solution to office space: integrating product, service and experience. At the heart of the new model was a mission to provide an eco-friendly, sustainable and customized product to clients...With the new business model, we differentiated ourselves from competitors in the office furniture sector and transformed into a sustainable design-solution brand*” [I].

After adopting our new business model in 2014, the company **won the custom of big corporations** such as *Huawei* (who awarded them as an ‘Excellent Supplier’), *Alibaba*, *China Net*, *China Mobile*, etc [I]. *Victory* have gone on to redesign and redevelop *Huawei* offices in over 14 countries worldwide.

The company enjoyed a **70% growth of its sales revenue from 2014 to 2018** in the relevant part of its business, and has become one of China’s the Top Ten Office Furniture Brands. The new business model significantly improved efficiency by decreasing the traditional construction time from 200 to 67 days and compressing five stages into two stages. **Environmental improvements** were achieved by creating a modular approach with new materials: standardized units mean that **reuse of materials increased from 10% to 95%** for customers moving offices (significant cutting waste), with the new materials **eliminating formaldehyde emissions** [I].

These two firms achieved the Guangdong Provincial Cup Award in 2012 and 2014 respectively for their new business model designs [D].

(5) Sources to corroborate the impact

[A] *Made in China 2025*, section 3.1, third paragraph (archived November 2019)

[B] Letter from Mr. Yanming Zhang, *CMES* and project leader, July 2019

[C] Article (January 2018) on implementation of *Made in China 2025* (archived November 2019)

[D] Letter from by *Guangdong Industrial Design Association*, July 2019

[E] 2018 Annual Report of *Shangpin*

[F] 2015 Prospectus for stock market listing of *Shangpin*

[G] Ali Research article (2012). *The Chinese Sample of C2B Mode. Shangpin in Harvard Business Review* <http://www.aliresearch.com/blog/article/detail/id/14877.html>

[H] Advanced Industry Research Institution article: *2019 Analysis on Chinese Customized Furniture Industry* (archived November 2019)

[I] Letter from *Victory*, October 2019