SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

2 July – 7 September 2020

TOPICAL REPORT

DESIGN & INNOVATION

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DESIGN THINKING

Why you need Design Thinking and Proofs of Concept to level up your business

"The race is on. Since the introduction of social distancing measures earlier this year, the market has suddenly become a real life version of "the floor is lava", with startups and even large enterprises jumping from idea to idea, and competing for funding, customers, and survival."
Source: TNW

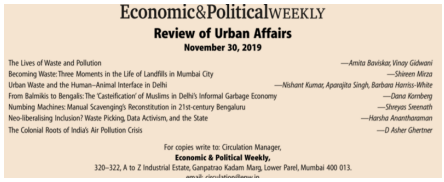
How design thinking can improve technology forecasting

"In 1873, an esteemed British inventor said: "The Americans need the telephone, but we do not. We have plenty of messenger boys." On the flip side, The Simpsons predicted FaceTime and 3D printed food long before their inception. Right or wrong, technology forecasting can be tricky. Here, we share how we approach this daunting task."
Source: Ericsson

How to Do Design Thinking Better

"Design thinking has, perhaps, reached peak popularity. Businesses in every industry talk about ideating and iterating, a linguistic nod to the creative process made famous by design and consulting firm IDEO."
Source: Kellog Insight

DESIGN THINKING


Economic&PoliticalWEEKLY
Review of Urban Affairs
November 30, 2019
The Lives of Waste and Pollution —Amita Baviskar, Vinay Gidwani
Becoming Waste: Three Moments in the Life of Landfills in Mumbai City —Shireen Mirza
Urban Waste and the Human–Animal Interface in Delhi —Nishant Kumar, Aparajita Singh, Barbara Harriss-White
From Balmikis to Bengalis: The 'Casteification' of Muslims in Delhi's Informal Garbage Economy —Dana Kornberg
Numbing Machines: Manual Scavenging's Reconstitution in 21st-century Bengaluru —Shreyas Sreenath
Neo-liberalising Inclusion? Waste Picking, Data Activism, and the State —Harsha Ananthasayanan
The Colonial Roots of India's Air Pollution Crisis —D Asher Ghertner
For copies write to: Circulation Manager,
Economic & Political Weekly,
320–322, A to Z Industrial Estate, Ganpatrao Kadam Marg, Lower Parel, Mumbai 400 013.

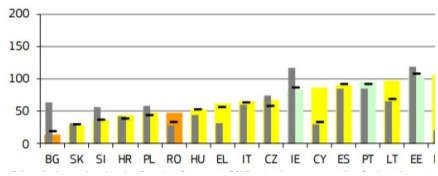
Extending Design Thinking to Public Policy

"Design thinking as a subject has grown enormously in theoretical content over the past 50 years. However, both design thinkers and policymakers have not come closer to developing design thinking in policymaking. Recognising this research gap, a prototype called the basic resource gap model has been designed as a supplement to the extant fiscal rule, with fiscal deficit as its target. The study highlights both the potential applicability of the design-thinking approach to the process and specifies an application that can supplement the extant fiscal rule and potentially enhance fiscal management."
Source: Economic & Political Weekly

Design thinking for innovation: Considering distinctions, fit, and use in firms

"As firms struggle with high failure rates when developing new products and services, they seek new approaches to innovation. One method garnering attention is design thinking (DT), a design-based method of problem solving. Businesses as varied as Airbnb and PepsiCo are embracing DT in growing numbers, but some may be joining the bandwagon without understanding its distinctions compared to the main alternative, the Stage-Gate (SG)

INNOVATION



Innovations in Artificial Intelligence and Virtual Reality

"This edition of IT, Computing and Communications (ITCC) Technology Opportunity Engine (TOE) provides a snapshot of the emerging ICT led innovations in artificial intelligence (AI) and virtual reality (VR). This issue focuses on the application of information and communication technologies in alleviating the challenges faced across industry sectors in areas such as healthcare, retail, legal, ICT, real estate, and travel. In addition, this issue highlights emerging innovations and disruptive business models in a post-COVID scenario."
Source: Frost and Sullivan

Design in innovation strategy

"Over the next four years, we will address these barriers through an ambitious, targeted and well-managed programme of investment, championing and support, which will be structured under four themes that meet recognised business need"
Source: Innovate UK

Global Innovation Index 2020

"In 2020, the Global Innovation Index (GII) presents its 13th edition dedicated to the theme Who Will Finance Innovation? This edition sheds light on the state of innovation financing by investigating the evolution of financing mechanisms for entrepreneurs and other innovators,

Design Thinking Is The Core Of Disruptive Innovation

"Design is changing the manner in which leading organizations make value. The focus of innovation has moved from engineering-driven to design-driven, from product-driven to client-driven, and from marketing-focused to user-experience-focused. For an increasing number of CEOs, design thinking is at the center of viable strategy development and organisational change."
Source: Analytics Insight

DESIGN EDUCATION

Why we should empower our students to redesign everything

"Inherent talents aside, recent research shows that wicked problem-solvers are cultivated through training and experience. These ideas trace back to David Kelley's seminal work at Stanford University in the 1990s, when he first began the transdisciplinary approaches that informed his budding business, IDEO."
Source: Universityworldnews

INNOVATION

Design Innovation in Plastics: Pedal power proves perfect for 2020 winner

"Organised by the Institute of Materials, Minerals and Mining and the Worshipful Company of Horners, and industry headline sponsored by Covestro, DIP challenged students to come up with a brand new product on the theme of urban living, which would enhance life in a city environment, for use in flats or whilst commuting."
Source: British Plastic and Rubber Magazine

Digital design innovation in Singapore: From 3D architecture to AR platform

"DesignSingapore Council reveals details on Singaporean start-up, AIRLAB which specialises in 3D-printing in architecture while designer brand Ipse Ipsa Ipsum has created an AR platform to create, customise and order furniture"
Source: World Architecture News

methodology. SG, a project-review process, is used in many firms today to create innovations. To guide managerial consideration of DT, this article provides an explanation of DT as compared with SG, a framework to assess DT's fit with the firm, and ways DT may be effectively used."
Source: Business Horizons

Twelve tips to stimulate creative problem-solving with design thinking

"The design thinking framework helps individuals approach problems with a user-centered focus; the emphasis is on understanding the user experience, their challenges, and possible design solutions that are aligned with their needs. In this twelve tips paper, we describe strategies that health professions educators can use to prepare for, conduct, and support design thinking. These strategies may also be useful to learners, practitioners, and organizations to address complex problems."
Source: Medical Teacher

Design Thinking and the Digital Ecosystem

"Drawing on past research, models and theories, it proposes two conceptual frameworks for facilitating interactive and collective design thinking in a digital ecosystem. The new frameworks of Digital Design Thinking (DDT) processes and functionalities are then used to examine six examples of collective and interactive platforms. This chapter contributes to a better understanding of creative, collaborative design thinking using digital tools and within digital environments."
Source: Design Thinking: Creativity, Collaboration and Culture

Design Thinking and Building Information Modelling

"This chapter presents a new BIM knowledge framework which is founded on a collaborative design thinking approach. This new framework adopts emerging ontologies and technologies that enable collaborative design thinking and decision-making through better support for design representation and communication among users."
Source: Design Thinking: Creativity, Collaboration and Culture

Design thinking as an innovation strategy for business and marketing plans

"This paper examines the possibilities of design's contribution to other professional fields through a design thinking process model called MOPDET. The model was structured based on concepts of 11 authors. In and by pointing to progress and remaining challenges—including in the context of the economic slowdown induced by the coronavirus disease (COVID-19) crisis."
Source: Global Innovation Index

STARTUPS

The Global Startup Ecosystem Report 2020 (GSER2020)

"Startup Genome's mission is to accelerate startup success and ecosystem performance everywhere, working together with global thought leaders to define and execute robust policies and programs that drive lasting change. Our impact is rooted in over a decade of independent research with data on over a million companies across 150 cities."
Source: Startup Genome

Design Innovation Starts With Empathy

"When a company crowdsources innovation, they reach beyond the four walls of their organization for broader input into a product or service. This can be done by talking to customers, brainstorming with ecosystem partners, or tapping members of different industries entirely."
Source: Forbes

In the data revolution, digitally-led innovation is the future of design collaboration

"Collaboration is often held up as the answer to materially better outcomes but it's time to explore the role that digital technologies – such as VR design reviews – can play in achieving better outcomes, argues Dale Sinclair"
Source: Architect's Journal

Driving Product Innovation With Reverse Engineering

"Every time you capture physical reality to use as part of your digital design process, you are engaging in reverse engineering. Whether you call it reverse engineering or something else, you are almost certainly measuring physical parts and using those dimensions to inform multiple aspects of your product designs. And you are probably doing this multiple times throughout each product lifecycle."
Source: Metrology

Time for a health innovation pact: rethinking the design and delivery of healthcare

"Wishing someone good health is a common custom with a long history, but being and staying healthy has never been more important. Nor, indeed, collaboration. In 20 years of working in the pharmaceutical sector, I've seen a steadily increasing willingness to partner with others to optimise healthcare and accelerate scientific research – a willingness that has only been amplified by this new context in which we find ourselves."
Source: Pharmaphorum

3D Printing Provides Innovation for Nearly Century Old Manufacturer

"As we have covered in recent months, COVID-19 played a pivotal role putting additive manufacturing on the map for manufacturers who otherwise had not taken its potential role seriously. For those willing to explore, additive has been enabled companies to speed up the prototyping process, enabled manufactures to build tooling without traditional delays. Of course, the true wins occur when the maturing

this sense, the investigation brings relevant concepts about design since the 1960s. The literature review also addresses business plan and marketing plan. The results chapter describes the applications possibilities for MOPDET under 3 circumstances, as well as the expected outputs for each one. Finally, in the conclusions it is suggested as future research the application of the model in other professional segments."
Source: Ferro

Relationship Between Design Thinking And Personality Traits

"This paper is an attempt to gain better insight into design thinking from a micro-viewpoint through the association of design thinking with human beings' personality traits. Based on previous research, we conjecture that personality traits are also associated with the capacity for utilizing design thinking. To test our hypothesis, we focused on the five-stage Design Thinking model proposed by the d.school and utilized FFM (Five-Factor Model) to describe personalities. 28 students, who have experiences of design thinking activities, participated in the study. We used correlation analysis and observed the significant relationship between personality traits and individuals' capacity for utilizing design thinking"
Source: Proceedings of the Sixth International Conference on Design Creativity (ICDC 2020)

The Wrong Theory Protocol: A Design Thinking Tool To Enhance Creative Ideation

"Supporting designers to empathize with stakeholder points of view while still developing creative solutions is challenging, particularly when stakeholders' lives and experiences are quite different from their own. In this study, we characterize a new ideation technique, wrong theory protocol (WTP), that has supported student designers to come up with empathetic and creative ideas. Participants included students enrolled in undergraduate and graduate courses at a Hispanic-serving, research university in the southwestern US. In WTP, participants first frame a problem and are then prompted to come up with solutions that would harm and humiliate the intended users before coming up with beneficial ideas. Using artefacts from WTP sessions, we analysed the diversity of both harmful/humiliating and beneficial ideas. WTP participants produced divergent, empathetic ideas, suggesting WTP supports creative ideation."
Source: Proceedings of the Sixth International Conference on Design Creativity (ICDC 2020)

technology enables meaningful innovations. And, true innovation often comes from the places you least expect."
Source: Industry Week

Where Will Innovation in Architecture Come From Next?

"Now more than ever, architecture is in need of innovation. The pandemic has made us fundamentally rethink the functioning of our cities, public spaces, buildings, and homes. Meanwhile, the recent Black Lives Matter and racial justice protests have us questioning architecture's complicity in broader socioeconomic issues. These challenges are pressing, and we cannot put off changing architecture any longer."
Source: Archdaily

ENTREPRENEURSHIP

The Future Of Entrepreneurship In The 21st Century

"For years, becoming an entrepreneur has been the goal of many a would-be business owner. The lifestyle, flexibility of working hours and the ability to set yourself up financially, potentially for life, is a call that thousands each year find difficult to ignore, taking the leap and setting out on their own business ventures. What puts a large fraction of potential entrepreneurs off, however, is the inability to decide what kind of business they are best to venture into in the first place. What do consumers favor in 2020, and what will make you more likely to succeed? Is it innovative ideas, bringing something completely new to the market? Is it about keeping a keen eye on consumer trends and new markets? Or is it perhaps all about embracing the move towards sustainability and using business to 'give back' to the world around you?"
Source: Ritz-Herald

Starting Young: Developing A Culture Of Entrepreneurship

"It is never too early to start nurturing an entrepreneurial spirit, and there are various approaches to foster its development. Everyone is born with the potential to be an entrepreneur, and the sooner we begin developing the key traits that define a successful entrepreneur, the more likely a person will go on to make a positive impact when they enter the workforce, whether they pursue a career in entrepreneurship, or follow a more traditional path."
Source: Entrepreneur

Design thinking: guidelines for organizations

"The objective of this paper is to iterate proposed functional guidelines for the assertive practice of design thinking in organizational environments, and therefore to promote innovation. Three specific guidelines - Design conductive formalization, Responsible hierarchical presence, and Integrative functional differentiation - go through a qualitative validation. Theory triangulation is conducted through semi-structured interviews with ten experienced professionals. After consensual assessments and value judgements through Likert scales are formalized, the functional guidelines are improved."
Source: DS 101: Proceedings of NordDesign 2020

Planning by Design: Applying design thinking to municipal planning

"This research explores how design thinking can generally be applied to municipal policymaking. More specifically, it explores how a sprint methodology—a three to five-day intensive workshop that employs design thinking—may be applied to the municipal planning process. As the challenges facing our cities become more uncertain and complex, local governments must respond to urgent and ever-adapting demands. The recent onset of the COVID-19 pandemic has drastically increased the uncertainty and complexity of the modern world. The structure of bureaucratic organizations—which were built for a different reality in past centuries—inhibits the ability for municipal planners to keep up with complex, ever-changing challenges. Design thinking offers a set of processes, tools and methods that can help public servants respond to such problems. It can also help maintain a focus on empathizing with citizens, which can easily get lost in the 'churn' of typical planning processes. Through an extensive literature review and interviews with 27 planners and designers, the research revealed four key insights."
Source: University of British Columbia

DESIGN EDUCATION

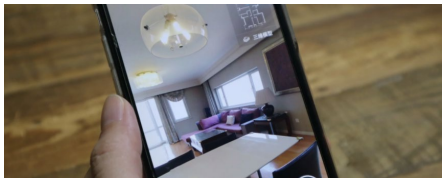
Teaching Innovation: Designing A Curriculum To Change The Military

Seven things entrepreneurs can learn from failure

"Failure is the last word on an entrepreneur's lips when they're in start-up mode and insolvencies are soaring as a result of the economic devastation caused by the coronavirus pandemic, said Alan Manly, founder of the Universal Business School Sydney. However, failures offer valuable insights for steering the ship to calmer waters, added Manly."

Source: CEO magazine

ENTREPRENEURSHIP



Chinese 'corona-tech' startups raising big money

"Funding in private companies in China from January through June was concentrated in medicine and health care, as well as "corona-tech" companies that have developed online solutions in areas such as real estate and education amid the pandemic, according to Chinese startup news site 36Kr, which is in partnership with Nikkei. Investment in artificial intelligence and semiconductors also increased due to the U.S. conflict with China in the high-tech sector."

Source: Nikkei

"This paper identifies the structure and the content of a curriculum designed to teach innovation. Through research of current programs and innovation theory, a successful innovation curriculum is one that is designed around project-based learning, bridges military organizations with the commercial and academic realm, and teaches the fundamentals of innovation."

Source: Naval Postgraduate School

Analyzing the effects of artificial intelligence (AI) education program based on design thinking process

"In the AI education program, students explored and defined the AI problems they were interested in, gathered the necessary data to build an AI model, and then developed a project using scratch. In order to analyze the effectiveness of the AI education program, the change of learner's perception of the value of AI and the change of AI efficacy were analyzed. The overall perception of the AI project was also analyzed."

Source: KAIST

Research and Construction of the Innovation and Entrepreneurship Collaborative Education Pattern of Design Discipline

"As a significant place of design education, there are many problems in Universities, such as unitary teaching pattern and inadequate students' innovation and entrepreneurship training. Based on the analysis of several typical cases of innovation and entrepreneurship education in universities located in Shanghai, this paper explores to establish a "Five-in-one cooperative education pattern", which means university, society, industry, scientific research institutions, and enterprises are supposed to cooperate closely."

Source: International Conference on Applied Human Factors and Ergonomics

Educating future engineers - student perceptions of the societal linkages of innovation opportunities

"This paper describes a problem centered approach towards introducing mechanical engineering students to sustainable, ethical and collaborative innovation, through an analysis of student work and feedback gathered from a ten-week long pilot conducted as part of a compulsory, Master's level, academic year-long Mechanical Engineering course."

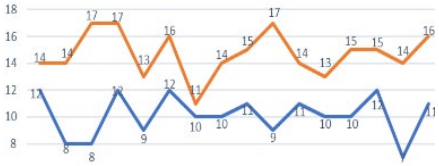
Source: 2020 ASEE Virtual Annual Conference Content Access

Design Odyssey: A Co-Curricular Design Innovation and Entrepreneurship Program for Systemic Change in Design Education

"A mentorship and training program led by the SUTD-MIT International Design Center (IDC, idc.sutd.edu.sg), and referred to as Design Odyssey (https://idc.sutd.edu.sg/programmes/designodyssey/) [1] (Figs. 1-2), is a co-curricular program that helps students apply the principles of design innovation, human-centric design and making, and bridge the gap between theory and practice to unleash innovation, social awareness, and social entrepreneurship [2-10] (Fig. 3). The mission is to groom change agents and social entrepreneurs to be champions of Design Innovation (DI) in Singapore, the ASEAN region, and beyond."

Source: ASME International Design Engineering Technical Conference

INNOVATION



Innovation strategies model in the design management

"Design management can contribute to the survival of these companies, but there is no recipe formed or a standard model for how it can be applied, especially when it is about small businesses. The guiding question of the research is what design innovation processes a company can adopt to become competitive? Intending to contribute to this issue, the research relates design with innovative strategies to propose best practices that can improve the competitive performance of small businesses. Through a systematic literature review, following the Visual Method for Systematic Design Review presented by Blum, Merino, and Merino (2016), eight articles from the last fourteen years were selected and further analyzed with proposals for strategies for innovation promoted by design."

Source: Santos

Crafting Futures: Inspiring Interdisciplinary Innovation with Young Craft Artisans in Malaysia

"The authors share insights surrounding the co-design process of programme development and delivery, where themes around gender, neo-colonialism and cross-cultural collaboration emerged. The

authors conclude by discussing the value and impact of participation for the students, and set out directions for future regionally-focused research in the Malaysian craft context."
Source: The Glasgow School of Art

Designing the Future: Past and Future Trajectories for Design Innovation Research

"In this article, we focus on design innovation, that is, innovation in the external appearance of a product. Design has become an important competitive tool for managers and a fruitful area of research for scholars."
Source: Journal of Product Innovation Management

The Effect of Creative Potential on Innovation Behavior: focusing on Design Thinking

"The design thinking-based program was found to have a statistically positive effect on creative potential, creativity, and innovation behavior. As another hypothesis of this study, by applying the design thinking-based program, it was statistically confirmed that creative potential has a direct, indirect effect, and a mediating effect on innovation behavior."
Source: Journal of Distribution Science

Crowdfunding for Design Innovation: Prediction Model With Critical Factors

"To guide designers and innovators for crowdfunding campaigns, this article presents a data-driven methodology to build a prediction model with critical factors for crowdfunding success, based on public online crowdfunding campaign data. Specifically, the methodology filters 26 candidate factors in the real-win-worth framework and identifies the critical ones via stepwise regression to predict the amount of crowdfunding. We demonstrate the methods via deriving prediction models and identifying essential factors from three-dimensional printer and smartwatch campaign data on Kickstarter and Indiegogo. The critical factors can guide campaign developments, and the prediction model may evaluate crowdfunding potential of innovations in contexts, to increase the chance of crowdfunding success of innovative products."
Source: IEEE Transactions on Engineering Management

Biomimicry Learning as Inspiration for Product Design Innovation in Industrial Revolution 4.0

"The content of this study is to learn and evaluate the process and result

of student's biomimicry observation into innovative product design. The conclusion can also be drawn that comparing the different levels of students which is the first year, second year, and third-year students by using the biomimicry observation approach will show variated concepts and skills on their work depending on what knowledge that they have learned from each semester."
Source: International Journal of Creative and Art Studies

Research on Innovative Design of Traditional Craft Products in the Intelligent Age

"In this context, this article will start by clarifying the significance of the application of intelligent technology in the design of traditional craft products, combining specific examples, focusing on a brief analysis and research on the innovative design of traditional craft products in the era of intelligence."
Source: 2020 International Conference on Environment and Water Resources Engineering (EWRE 2020)