

Investigating Innovative E-Commerce Practices During COVID-19 Movement Control Order: Lessons from 4 Examples

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Abstract. The Movement Control Order (MCO) encourages mandatory stay-at-home and has resulted in much socio-economic-technical repercussions. As such, this study aims to identify lessons from innovative examples to quicken recovery for the tourism industry in Malaysia. We investigate two examples of global innovation and two examples of local innovation with regards to organizational/process/product (including innovative privacy and security protection) and marketing innovation during the COVID-19 MCO in Malaysia. Findings highlight the need for organizational innovation, (including careful privacy and security protection), followed by business model transformation through shifts in centrality in design, mediated by product/process/marketing innovation. A human-centred, crowd-sourcing (social-collaborative computing) use case is presented as an example. Another key contribution is confirmation of a Restorative Innovation framework's components and its adaptation post-COVID-19.

1 Introduction

Economic recovery from COVID-19 and its movement control order (MCO) would tax many countries not only in terms of healthcare, but also mentality, practices and market share. In an age when many are suggesting that we will most likely see more merger and acquisitions, decentralization enhanced by technology are thriving, such as food delivery systems. There are also many who share messages of hope and carry on with business with just a video camera, knowledge and skills such as the exercise industry and the entertainment industry.

Another example is contact tracing. One of the most challenging parts of contact tracing is to reconstruct where people have been, in order to discover when some people may have been near others. Initial contact tracing efforts have been through traditional means such as interviews, phone calls, tracking data on spreadsheets. As the number of COVID-19 cases increases, contract tracing workers start getting overloaded and spreadsheets become less efficient when matching contacts. The mobile phone is then utilized as citizens carry their mobile phones around with them most of the time. Furthermore, mobile apps can track a variety of variables, e.g. (a) GPS

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O. Gervasi et al. (Eds.): ICCSA 2020, LNCS 12254, pp. 910–922, 2020.
https://doi.org/10.1007/978-3-030-58817-5_64

location; (b) presence at locations e.g. malls or stores in malls; or (c) proximity tracing when two Bluetooth devices running the contact tracing app come within ranges of proximity. China extends such sensor technologies, with color codes. This extension not only addresses the problem of contact tracing but also aids clear and simple communication; a very lean, multi-pronged effective solution.

With many countries implementing state surveillance, privacy and security are carefully considered. For instance, for GPS location to be useful for contact tracing, a continuous stream of GPS locations would have to be recorded by each running app, and possibly, passed back to a server to match locations with time. Such data can be misused in the wrong hands. Hence, it is critical to design and implement the system securely, so that no unauthorized person can a) access the GPS data of the app users, and b) leak/modify the data. A creative policy by Singapore [1] has data remaining encrypted on the device until and unless the user is confirmed to be a COVID-19 patient. If and only if the latter happens, then the data is passed to the Ministry of Health.

All these examples highlight that addressing concerns during MCO and post-COVID-19, requires well-planned, lean, multi-pronged, creative transformations and agility in technology design, development and management.

1.1 Objectives

We are interested to investigate:

1) two international case studies with regards to process/organizational/marketing/product innovations the tourism industry has evidenced during MCO, which can be adapted to the local context post-COVID-19,
2) two local case studies with regards to process/organizational/marketing/product innovations the tourism industry has evidenced during MCO, which can be enhanced post-COVID-19,
3) key factors which would enable faster recovery post-COVID-19 in line with [2]'s Innovation Diffusion theory,
4) the efficacy of [3]'s *Payitbackwards* framework and adaptation of [4]'s Restorative Innovation model. Considering the higher initial cost in the latter, we would like to investigate how we can adapt these economic-cum-restorative concepts to the Malaysian context and for bad economic times post-COVID-19.

1.2 Framework

With little or no revenue during MCO due to movement constraints, there is a need to increase creative use of technology to mitigate economic impacts as much as possible, while creating tangible and intangible benefits with lean costs and management. [5]'s studies on generative processing for education and healthcare builds on [6]'s cognitive load theory and suggests that germane cognitive load needs to be addressed first and then used to offset intrinsic and extraneous loads. Hence, we surmise that in economics, germane, intrinsic and extraneous loads are analogous to new directions, debts/constraints and external competition. Moreover, distributed cognition can offset the load of enactive and embedded cognition. This creates room for technologies such

as Internet of Things (IoT). However, to be lean and sustainable begs the question how?

Two frameworks are applied for this research:

a) [3] 's *Payitbackward* framework identifies key tenets to open innovation/co-creation as collaborative-social human-centered computing mediated/motivated by diversified task-reward models (Fig. 1). They suggest that these can form the foundation for formulation of different business models, useful especially during economic downturns,
b) [4] 's Restorative Innovation framework (Fig. 2), an economic model, sheds further light on possible foci. In the framework, value capitalization focuses on three components, i.e., *health*, *humanity* and the *environment*. With mass acceptance/adoption, economy of scale would result.



Fig. 1. Key tenets underlying [3]'s Crowdsourcing-HCI *PayItBackwards*

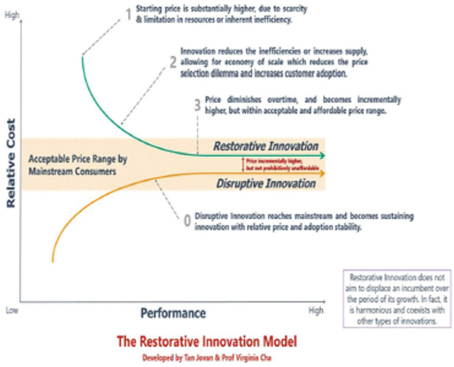


Fig. 2. [4]'s Restorative Innovation framework (used with permission)

Both frameworks are generative processing models and involve knowledge management. They also highlight the importance of human-centred computing and social/collaborative computing/engagement. However, we surmise that the success of any open innovation framework would depend much on human capital development as well as the establishment of a robust, lean yet equitable entrepreneurial ecosystem.

1.3 Hypothesis

We note that centrality of design [7] in model-driven architectures, shifts with the context, task, assessments [8] and specific needs of a demographic. This means that [4]'s Restorative Innovation is likely to result in disruptive innovation, by redefining opportunities to those which are needs-based, reusable and sustainable. In addition, [9] proposes that systematic reuse of software can be in different forms and is based on architecture, process and organization. This proposition is supported by [10, 11]'s series of studies on reuse in Malaysia.

We hope to identify business process re-engineering practices that would be restorative in the long run. Based on [7]'s centrality of design and [9]'s proposal that systematic reuse of software is based on architecture, process and organization, we hypothesise that shifting the centrality of design by pivoting and subsequently reusing/refactoring/reengineering existing Service-Process System Innovation towards needs-based domains which share core services-processes are more likely to be pervasive and successful post-COVID.

1.4 Contributions

Our contributions are:

a) identification of e-commerce-based process/organizational/marketing/product innovations during Movement Control Order (MCO), which subsequently confirms the value of shifting centrality of design to result in creative transformation;
b) confirmation of [4] 's framework components/foci, i.e., health, humanity and the environment and adaptation of the framework to include fractal reverse engineering;
c) confirmation of the analogical efficacy of [6]'s cognitive load model and economics with regards to generative processing.

2 Related Work

The novel coronavirus has impacted industries beyond imagination due to the speed by which it spreads, the number of infections, fatalities and seriousness of after-effects. Global statistics indicate that the novel corona virus has resulted in a total of 9, 277, 214 confirmed cases of COVID-19, including 478, 691 deaths, reported to WHO [12].

Many countries have implemented nation-wide or partial lockdown, i.e., Movement Control Order (MCO). These restrictions have gravely impacted GDP and unemployment rates are rising. Malaysia is not spared. For instance, Malaysia's MCO [13] covers these measures:

a) no religious, social, cultural or sports activities or mass gathering;
b) self-quarantine of 14 days for Malaysians returning from overseas;
c) closure of borders and cancellation of flights resulting in no tourist inflows;
d) closure of kindergartens, government as well as private schools and universities;
e) closure of all government and private organizations, excluding utility, health, safety, banking, transport, retail.

Consequently, the Ministry of Tourism, Arts and Culture has announced that all over-the-counter and online new applications, renewal of travel and operating licenses for businesses, travel tourist guides, tourism training institute and registration of rated tourist accommodation premises are on hold [14]. Furthermore, hotel cancellations have challenged hoteliers to their wits ends. To highlights its gravity, Malaysian Association of Hotels CEO, Yap Lip Seng, laments that based on historical data, the first 14 days of MCO (from March 18 to 31) has resulted in an estimated RM560 million (US$127.3 million) loss in (hotel) business [15].

[16] therefore contend that to transform tourism, we need to change our focus from number of arrivals as the means by which success in tourism is measured. They add that though number of arrivals is the norm to UNWTO, ICAO, CLIA, WTTC and many other local organizations, fixating on volume may block our perspectives to hitherto hidden opportunities facilitated by technology.

For instance, for elderly Asian tourists, [17] point out that post-SARS, personal economic wellbeing and disposable income, changes in cost, perceived health risks, and changed capacities for consumption influences consumer behaviour. [18] see a silver lining from these past lessons. In a survey, they find that consumers in China, Italy, Spain, UK and the US are becoming more optimistic, having crossed the early stages of the issue-attention cycle [19]. In [20], they surprisingly, find that Chinese consumers are increasingly interested in environmentally friendly products. Hence, [20] suggest that with the uncertainties and global magnitude of the COVID-19 pandemic, we should not be in a hurry to revert back to what was. Instead, we should reconsider global economic value chains to align more closely to the Sustainable Development Goals. Only then, will tourism be sustainable.

Along similar lines, [21] opines that we need to consider the macro-and microeconomic principles and basic requirements for the development of strategic innovative activities. Such strategic innovations must aim at not only increasing resource potential but more importantly, to do so, without increasing the use of these resources. As such, the volume of resources may not be as important as their quality, structure, balance and rationality of use.

Similar to the above, [22–25] agree that the socio-economic system has innovation potential. These are often in terms of service innovation and its indicators, i.e., organizational, product, process, marketing innovations. If designed well, especially strategic marketing via technological advancement, well-trained service teams, transparent information sharing, on the newly discovered market, may emerge as and support innovations to promote long-term revenue growth, and accelerated industrial recovery.

So what is the way forward? [2]'s Diffusion of Innovation (DOI) Theory suggests that the innovation, communication channels, time, and a social system are key to the rate of technology adoption. The perception that the new idea, behavior, or product is new or innovative would increase the rate of diffusion.

This theory supports [26]'s propositions on the importance of customer engagement. This means that due to the uncertainties of how soon the economy will recover, government leaders as well as the market need to be even more sensitive to customer trends and needs. As such, many initiatives are aimed at focusing on the now with incremental plans for the future (Fig. 3). We conjecture that each company's capability maturity model would differentiate its ability to rise above disruption.

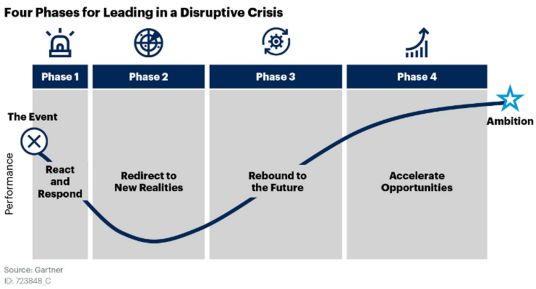


Fig. 3. [26]'s four phases to mitigate and lead during disruptive crises Source: McDonald/ Gartner [26], April 2, 2020

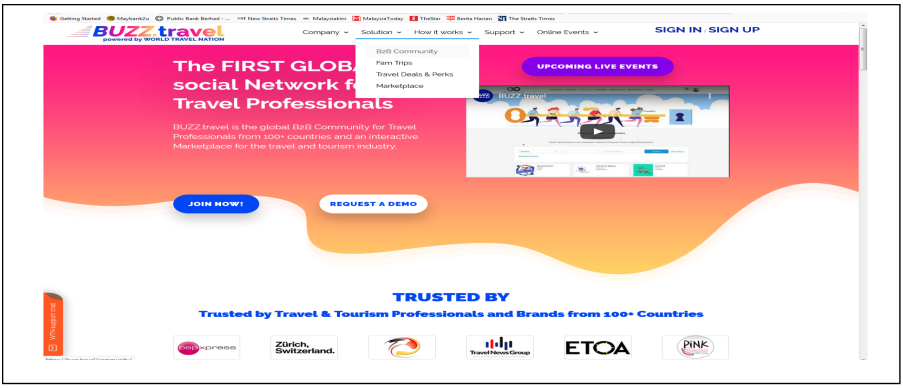
Moreover, being agile, [26] further recommends mobilizing people and customers to a future vision without fully defining that vision." They stress that this requires communication to be not only engaging but also clear and transparent, creating trust and awareness; a sense of inclusiveness; to lead and to bind people amidst changing public policy, cost-saving measures and restrictive movement.

3 Case Studies

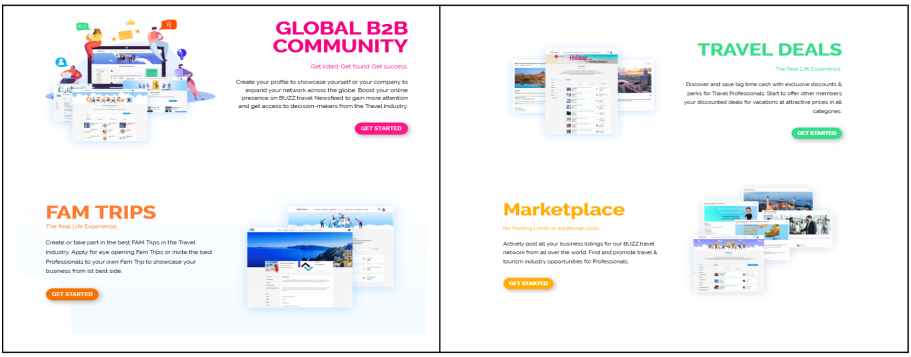
Many companies capitalize on object-oriented analysis and design (OOAD) and optimization of processes and outcomes. The following cases are exemplary of the use of OOAD and optimization. For instance, Alibaba is exemplary as a very successful *global supply chain* platform through its partnership with more than 22 global vendors. Such breadth in partnerships would enable anyone in the world to procure daily or niche items, in respective quantities without having to hunt high and low. Its supply chain is flexible based on tangible value e.g. ROI and intangible value perceived by users such as trust and diversity.

3.1 Buzz Travel: Organizational Innovation (OI) > Product Innovation (PIN) > Marketing Innovation (MI)/Process Innovation (PI)

Our main references for tourism are Buzz.travel and AirBnB websites. Buzz.travel in Europe (Fig. 4a, b, c) creates opportunities for B2B/B2C partnerships (organizational innovation). This in turn leads to marketing/process innovations for products such as family trips, community development and citizen journalism in video form where anyone can share their invaluable experiences. What sustains are not only the thriving social network but also *educational* opportunities such as webinars for members and the public which enables self-improvement and upward mobility across the network accessible at the marketplace (job opportunities) (Table 1).



(a)



(b) (c)

Fig. 4. a. Buzz's homepage. b, c. Buzz's homepage highlights
Source: Buzz.travel: https://buzz.travel/

Table 1. Buzz.travel's opportunities

Travel deals and perks	Marketplace	Community	Family Trips
Best rates in: •Hotels •Flights •Packages •Cruises •Tours	•Job Offers, Job Seek •Marketplace Ads •B2B Sales •Meetups •Webinars, Education •Exchange Programs	•Present a stunning profile •Interact with members in News Feed •Stay up to date with the latest Travel News, Forum	Post about family trips

3.2 AirBnB: Organizational Innovation (OI) > Product Innovation (PIN) > Marketing Innovation (MI)/Process Innovation (PI)

AirBnB's business model is also interesting. Organizational innovation shifts product/process and marketing innovation from physical rooms and services to hosting *experiences* online with attractive pricing; extending its reach to a wider global market. Furthermore, fun and education feature prominently. Anyone who signs up and design their experiences, share their ideas, submit their experiences, set up (including determine their own pricing) and start hosting. The highlights are presented in Table 2.

Table 2. AirBnB's online experience hosting analogical to music streaming



3.3 AirAsia: Organizational Innovation (OI) > Product Innovation (PIN) > Marketing Innovation (MI)/Process Innovation (PI)

AirAsia, Malaysia's local budget airline, shifts its business core to *emulate* e-commerce websites to what families would value during lockdown e.g. survival items, fresh mart, childcare relief, fashion and healthcare (Fig. 5). Experts in reuse of system processes, it reuses its current search, book and payment systems for the new products (Fig. 3) and links these to their reward systems. Hence, planes may not be flying much, but travel planning, and purchasing are still on-going.

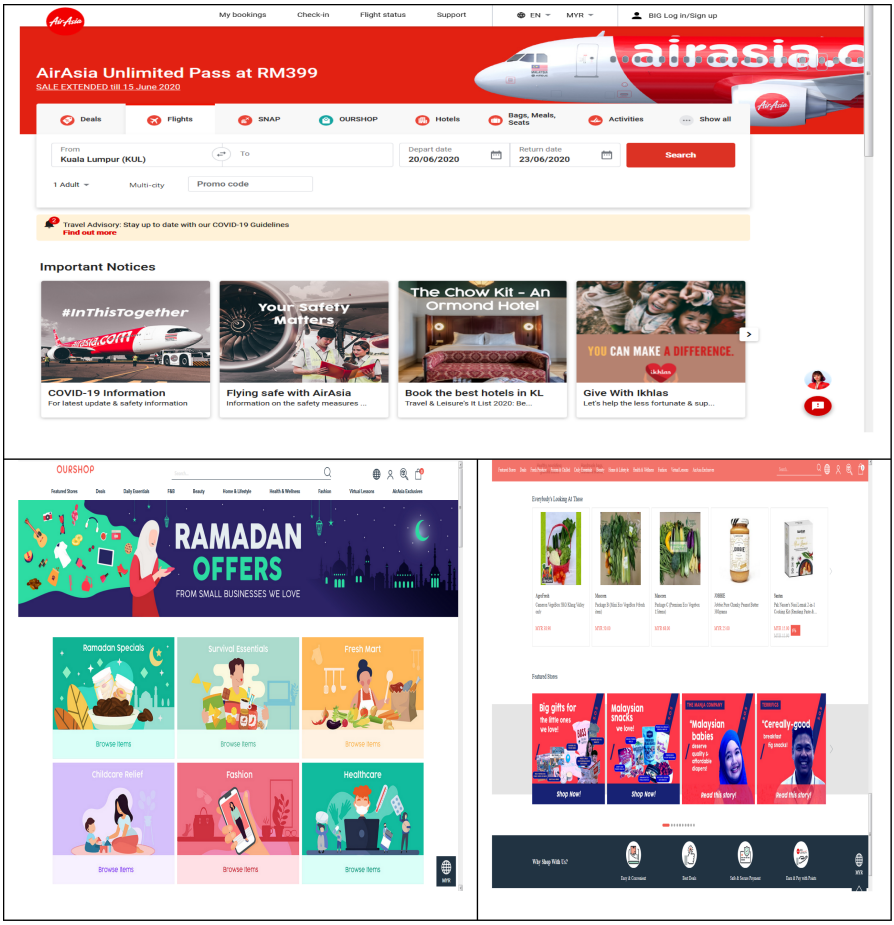


Fig. 5. AirAsia's extended business model
Source: https://www.airasia.com

3.4 Tourism Malaysia: Organizational Innovation (OI) > Product Innovation > (PIN) > Process Innovation (PI)/Marketing Innovation (MI)

Tourism Malaysia serves as a search, planning and experience sharing website. The planner is visual, attractive and user-friendly. Interaction e.g. citizen journalism and that of buzz.travel would spice up their website, extending and enhancing user experience. Post-COVID, the Government is encouraging domestic travel. From personalization using a Trip Planner, the new Tourism Malaysia website has included *networking* opportunities to increase the global value chain and more *interactive* displays with short videos of diverse attractions, analogical to highlights from a modern trendy "filmstrip". The videos tell the story best.

4 Suggested Human-Centred Social-Collaborative Computing

Based on the above findings, it seems logical that Ikeda and Bernstein [3]'s human-centred and social-collaborating computing, inclusive of citizen journalism, may result in faster recovery for the tourism industry. An example use case supported by the IEEE Systems, Man and Cybernetics (Malaysia chapter) is presented in Fig. 6.

It emulates Buzz, AirBnB's citizen journalism/customer-to-customer synergies and Alibaba's global supply chain. This use case is formulated during MCO and at a time when the end of MCO is uncertain locally and globally. As such, the taking of pictures and changing of the background of dream destinations via software, is deemed to be part of encouraging potential tourists to dream/imagine what actually being there would be like and thus to desire to travel to the respective destinations/countries more. The component is not meant to replace actual travel as nothing can replace the actual experiences, sights, sounds, smells and memories of actual travel. This is the generative aspect.

We conjecture that post-COVID, the contents will still focus on the above examples, (which incidentally support the Restorative Innovation framework's components), i.e., health, humanity and the environment. The forms of the latter two are creative playgrounds. Essentially, we *reverse* the Restorative Innovation framework's direction and promote *refactoring* at the system and component levels.

For community-engagement and open co-design, based on past studies [27, 28], developing the users' dispositions is also important. Success would, however, depend on the opportunities identified and capability maturity level of each company.

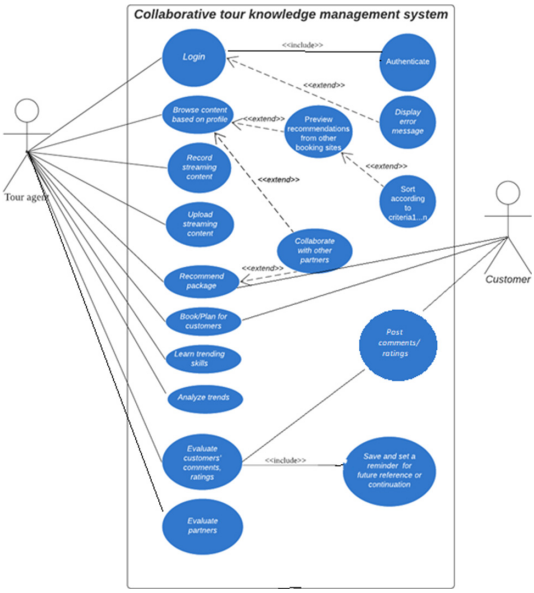


Fig. 6. Example of a human-centred social-collaborative computing use case

Recently, on June 23rd, 2020, Alibaba launched its online trade show, where vendors can stream live and interested buyers can chat directly with vendors. Similar to AirAsia, these are evidences of refactoring of its architecture and processes, made possible due to its existing Ali Cloud and very highly educated and tech savvy citizenry. The latent value is that of trending data analytics as a service (Analytics as a Service). This is a positive confirmation of refactoring and faith in human-socio-technical factors towards, improving economic resilience.

5 Conclusion

Transferring from researches, we have hypothesised that shifting the centrality of design by pivoting and subsequently reusing/extending existing Service-Process System Innovation towards needs-based domains, which inherently require similar core services-processes, are more likely to be pervasive and successful post-COVID. We have also hoped to extend [4]'s Restorative Innovative framework, highlighting the importance of business model transformations/adaptations with smart partnerships to create new value supply chains, for the shared economy to cope with environmental changes and customer trends in the new normal/post-COVID-19. We are not economists, but we believe that their framework can be applied in bad times, by *reversing* the framework's direction, while retaining all other aspects of the framework and while responsive to smaller fractal cycles arising from agile refactoring in architectures and business processes (improvements and reengineering).

From the above case studies, customer relationship management and event management (promoting, planning for different customer segments with different customized promotions) coupled with global value supply chain and citizen participation/journalism assisted by technology may be playground for further organizational/product/process/marketing innovations.

The above studies also suggest that for e-commerce-based organizational/product process/marketing innovations during Movement Control Order (MCO), centrality of design and transformative reuse within model-driven architectures, are critical, not only for inclusive design but also agility, extensibility and scalability. Correspondingly, SCRUM/KANBAN's user stories and sprints will feature more prominently in object-oriented design and development environments, adapted to different demographics to create attractive customer experiences.

Interestingly, the foci of innovations from these case studies, are evidently related to [4]'s health, humanity and the environment. Our contributions are thus a) confirmation of the value of shifting centrality of design to result in creative transformation during Movement Control Order (MCO), b) confirmation of [4]'s components and adaptation of [4]'s framework, c) confirmation of the analogical efficacy of the cognitive load model and economics. The findings also confirm [26]'s recommendations and [29]'s contention that web usability, playfulness, empowerment, and increasingly, storytelling beyond computational thinking, is important. How we think, influences our innovative capabilities.

Due to the small sample size, these preliminary findings need to be further supported and refined through more global and local examples. Hence, future work may

involve more sampling, more analyses and categorization to derive deeper insights based on the Innovation Matrix, inspired by Prof. Hajo Reijers's research.

Acknowledgement. The first author would also like to specially thank the following for their support when she was a Faculty in these universities: Multimedia University for systems modelling, AI and e-commerce, Universiti Tunku Abdul Rahman (UTAR) for the epistemology, foundations and the opportunity to experiment with design, design thinking, computational thinking and sustainability, fun and reuse in the creative industries. These form the foundations for the paper. She would also like to thank Prof. John H. Hughes, Senior Fulbright, for past collaboration on healthcare, Prof. Bo Jiang forprior collaboration on analogical and fractal thinking, Assoc. Prof. Boon-Liat Cheng for earlier support on digital marketing, and deepest thanks to the IEEE SMC (M) and UTAR for their invaluable support towards the use case in an IEEE HAC development grant application.

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