KHAZANAH NASIONAL

KHAZANAH MEGATRENDS FORUM 2019

FROM THE PAST TO THE FUTURE

BUILDING OUR COLLECTIVE BRAIN

CONCEPT PAPER

Introduction – After the Floods: The Isolation of Tasmania

Approximately 12,000 years ago, the melting of the polar ice caps flooded the Bass Strait which connected Tasmania to the Australian mainland. As a result, Tasmania, which was previously an Australian peninsular, found itself isolated from the rest of Australia. When European explorers first made contact with Tasmanians in the late 1700s, they found that the local population had the most basic toolkit of any society ever encountered by Europeans[1]. Interestingly, the explorers found that Tasmania lacked technologies such as the boomerang, fire-making, the spear-thrower, polished stone tools, and bone tools found on mainland Australia[2].

Adding to the puzzle, Joseph Henrich, an anthropologist and Professor of Human Evolutionary Biology at Harvard University, in his book, "*The Secret of Our Success*," writes that prior to the flooding of the Bass Strait, the "archeological remains left by Tasmanians cannot be distinguished in terms of complexity from those found in Australia." It is only after their isolation from mainland Australia that Tasmanians began to lose these tools, with bone tools dwindling gradually until they vanished entirely about 3,500 years ago. In

[1] Henrich, Joseph. (2016). "The Secret of Our Success: How Culture is Driving Human Evolution, Domesticating our Species, and Making Us Smarter." Princeton, New Jersey: Princeton University Press.
[2] Diamond, Jared. (1993). "Ten Thousand Years of Solitude." Discover, XIV, pp. 49-57.

an even more extreme case, the last inhabitants of Flinders Island, near Tasmania, died out about 4,000 years after being cut off by the rising seas[3].

North of the Bass Strait, life moved forward. The Pama-Nyungan expansion from northern Australia southwards brought to the south of Australia, including the part that was connected by land to Tasmania before the floods, "not only fancier stone tools, dogs, and seed grinders but also new social institutions and communal rituals[4]." The Pama-Nyungan expansion did not cross the Bass Straits.

Our Collective Brain – On Population Size, and Knowledge Dissemination

The isolation of Tasmania, separated from mainland Australia by the now flooded Bass Strait, gives us a crucial clue and, in the parlance of economists, a natural experiment into figuring out how and why societies grow or shrink. North of the Bass Strait, society continued to thrive, becoming ever more complex while south of the Bass Strait, Tasmanian society stagnated.

One of the clearest reasons for this divergence in fortunes is that of population size. The mainland Australian societies expanded and integrated with other societies, while the Tasmanian society remained cut off. The larger the population, the more ideas can crop up, the more technologies can be developed, and the more people there are to use these ideas and technologies. As Michael Kremer puts it, "...historically, among societies with no possibility for technological contact, those with larger initial populations have had faster technological change and population growth[5]." Henrich writes, "…more minds can generate more lucky errors, novel recombinations, chance insights, and intentional improvements.[6]"

The question is – why does this matter so much? Why does the size of the population matter so much in societal growth and technological progress? Why not have a smaller population that was just 'smarter'? To put it more starkly, what if, for example, we had a small society of geniuses versus a much larger society of people with average intelligence?

In many ways, the history of the human race is a history of continued collective learning. We have evolved to become outstanding 'cultural' learners. 'Culture', in this construct, is defined as, "the large body of practices, techniques, heuristics, tools, motivations, values, and beliefs that we all acquire while growing up, mostly by learning from other people.[7]" Therefore, over time, societies develop their own 'culture' which is, in essence, their collective knowhow or, as Henrich calls it, their own 'Collective Brain.' And indeed, it is "…our Collective Brain operating over generations, and not the innate inventive power or creative abilities of individual brains, that explain our species' fancy technologies and massive ecological success.[8]"

[3] Kremer, Michael. (1993). "Population Growth and Technological Change: One Million B.C. to 1990." The Quarterly Journal of Economics, Vol. 108(3), pp. 681-716.
[4] Henrich (2016).
[5] Kremer (1993).
[6] Henrich (2016).
[7] Ibid.
[8] Ibid.

Therefore, societies – whether neighbourhoods, governments, nations and even firms – progress only as far as their Collective Brain will take them. But if the size of a given society's Collective Brain is correlated to the size of the population, does this mean that only large societies can thrive? The answer is no. The potency of a Collective Brain does not depend solely on population size. What is equally and perhaps more important is social interconnectedness – how well lessons and knowledge disseminate across that given society.

As such, what the latest anthropological research – with the backing of robust computer modelling – tell us is that it is more important for a given society to be "social than innately smart in producing complex technologies…[9]" Crucially, this inter-connectedness does not refer simply to the level of network connectivity among members of society, but how well they 'connect' as well.. As populations grow, social norms – or culture – that more effectively generate cooperation and cultural learning in its members whether via institutions, rituals, languages, relationships ties, and so on, will have more success in building that society's Collective Brain.

Case Studies in the Collective Brain

The divergence of fortunes between Australia and Tasmania shows that while a society's given Collective Brain can grow with expansion and integration with other tribes and societies, that Collective Brain can also shrink and stagnate. As Henrich puts it, "Groups can and will lose know-how and never get it back." Therefore, if we fail to continue learning and disseminating knowledge over time, then we will fail to feed and build our Collective Brain. History has provided a wealth of examples of such cases.

Ancient Rome originated with the Roman Kingdom in 753 BC, culminating in the Roman Empire. A significant chunk of the Roman Empire, from 27 BC to AD 180, was the period called *Pax Romana*, a long period of relative peace and stability. During this period, the Roman Empire achieved its greatest territorial extent, and saw many advances, particularly in engineering and the arts. New roads and aqueducts were built, basilicas, baths, and the even the Roman Colosseum was built during the *Pax Romana*. Trade flourished and the people prospered, with Roman culture spreading throughout the Empire[10]. The *Pax Romana* ended with the death of Marcus Aurelius and the ascension of his son, Commodus, as emperor of Rome. The subsequent years saw Rome progressively decline, with the eventual end of the Western Roman Empire in AD 476. The fall of Rome marked the beginning of an unprecedented loss in Rome's collective knowhow accumulated over a thousand years, including education, literacy, sophisticated architecture, advanced economic interaction, and the rule of written law[11]. Over generations, the loss of the Roman Empire's Collective Brain plunged Europe into the 'Dark Ages', lasting close to a thousand years, before the Renaissance in the 14th century in Florence, just a short 300 kilometers away from Rome.

[9] Ibid.

[10] Wasson, L. Donald. (2015). "Pax Romana". Ancient History Encyclopedia. Viewed 9 November 2018, < https://www.ancient.eu/Pax_Romana/>

[11] Heather, Peter. (2011). "The Fall of Rome". BBC. Viewed 9 November 2018, < http://www.bbc.co.uk/history/ancient/romans/fallofrome_article_01.shtml>

Closer to home, we can also observe the impact of a failure to learn on the declining fate of the Melaka Empire back in the early 1500s. For much of its existence, the Melaka Empire had a strong and steady relationship with China, both in terms of maritime trade, as well as on protection from China. Despite these strong relationships, and despite the fact that gunpowder and propelled rockets were already in military use in China since the 10th century[12] and that, during the Ming Dynasty (1368 to 1450), China was a military superpower, the Melaka Empire never capitalised on and learned from China's vast military knowledge and expertise[13]. As a result, when the Portuguese conquered Melaka in 1511, one of the most important reasons for Melaka's defeat was its vastly inferior wartime technologies.

To be clear, it is not just nations or tribes that can lose their collective knowhow. The same is true of firms as well. There are several ways in which the Collective Brain of firms can shrink over time and they all relate to learning. How do Firms build and maintain their Collective Brain in the face of constant disruption? As product cycles become shorter and shorter, it is more imperative than ever for Firms to continue bridging the gap between transitions. However, as Firms grow larger, incumbent systems and processes make it challenging for Firms to respond quick enough to market changes. Learning stalls, innovation takes a back seat to bureaucracy and the growth of the Collective Brain stagnates. To what extent does a given firm learn from its past and plug that into its future? When employees leave the firm, how much of that employee's knowledge and lessons stays with the firm, and how much leaves with the employee? What systems and processes do firms have to document and disseminate knowledge to all employees? How do Firms overcome cultural and bureaucratic obstacles to continue growing?

In this regard, the experience of Sony is instructive[14]. This Japanese behemoth once wowed the world with its cutting edge innovation in portable radio, transistor TV and video recorders, even developing iconic products such as its "Walkman" and "PlayStation." By the 1990s, Sony became one of the world's leading media conglomerate with its venture into music distribution and movie production. After the PC and Internet revolution in 2000s, Sony started to lose its competitive edge as Apple ushered in the new era of software integration in 2001 with the release of the iPod and later on in 2007 with the iPhone. Despite their meteoric rise, Sony's organisational design and culture did not evolve, resulting in more rigidity, making it even harder to respond to disruption from Apple and Samsung. To make matters worse, Sony had already lost a substantial amount of its collective knowhow as many of its skilled engineers left the company after a major economic downturn in 1990s. Sony is an example of how organisational culture and inertia can become a deterrent to growing one's Collective Brain.

[12] Davie, Don. (2009). "Cannons of the Malay Archipelago". Journal of the Arms Collector's Association of the Northern Territory

[13] During the Ming Dynasty, China ramped up its production of gunnery by establishing two main weapon-manufacturing bureaus. Weapons were both practical and effective. The bowl-sized muzzle cannon, for instance, was commonly used and extremely effective, especially when defending against enemy ships. However, in Melaka, firearms were adopted more for their spiritual power than for practical value. See Sun (2003) and Tren and Reid (2006) for further details.

[14] Gulati, R., Nohria, N., Wohlgezogen, F. (2010) "Roaring Out of Recession." Harvard Business Review. https://hbr.org/2010/03/roaring-out-of-recession

Great learning organisations are not invulnerable either. General Electric ("GE"), with its strong learning culture, has always emphasised its corporate learning programmes, training scores and scores of executives out of its corporate university at Crotonville. Yet, it too was susceptible to a failure to learn. During his 17 year tenure as CEO at GE, Jeff Immelt undertook hundreds of Merger and Acquisition ("M&A") deals, buying and selling over USD100 billion of businesses. There were some wildly successful deals including the purchase of Enron's wind turbine manufacturing assets, and the sale of GE's plastics business to Saudi Basic Industries. Yet, at the same time, a recent Fortune article[15] writes that there was a pattern to Immelt's M&A deals which has contributed to GE's recent under-performance – "Immelt followed fads, [analysts and observers] say, paying top dollar to acquire the hot businesses of the moment." From 2010 to 2014, with oil prices hovering around the $100 per barrel mark, GE bought at least nine businesses in the oil and gas industry. In 2004, as housing prices in the US were continuing to skyrocket, GE bought a subprime mortgage company called WMC for USD500 million[16]. Now, for a CEO and a company to have undertaken hundreds of deals and consistently made the same mistake in M&A, it is worth asking to what extent were the lessons from those hundreds of deals captured and disseminated? Could a significant chunk of GE's current malaise have been avoided if GE simply developed its Collective Brain from its experience?

In the age of rapid technology disruption, Firms must not only grow their Collective Brain, but to also grow it faster than their competitors – and at times, hubris might cloud one's foresight on business strategy. Take Yahoo! for example[17]. Founded in 1994, Yahoo was a pioneering web portal with search functions, message boards, email, news, and more. It *was* the internet as far as many early users were concerned. In 1998, two engineers approached Yahoo to offer them a search-ranking algorithm for US$1 million, which Yahoo turned down as they were comfortable with their current search engine capabilities, but that algorithm would later become Google. Just like many other tech companies, Yahoo didn't survive the Dotcom Bubble unscathed, but they never seemed to recover as their net earnings hit -US$4.4bn in 2015. What happened? Yahoo's competitors simply outmaneuvered them in all of their business areas – Google overtook Yahoo as a search engine, Yahoo Messenger was outdone by Whatsapp and WeChat, Yahoo news portals were replaced by social media platforms such as Facebook and Twitter. Yahoo failed to choose a focus area to develop, hence failing to establish a strong brand name in any of its business area. In 2017, Verizon bought over Yahoo at just US$4.48bn, a tenth of what Microsoft offered back in 2008. Yahoo acts as yet another painful reminder, just like Blackberry and Kodak, that even if a firm is in a fast-growing sector, it should not take anything for granted, and instead continue building new skillsets required to stay competitive.

Building our Collective Brain – Implications on Markets, Firms, Development and People

If the success of a given group is dependent on its Collective Brain, and the Collective Brain is an accumulation of a "large body of practices, techniques, heuristics, tools, motivations, values, and beliefs" – culture and social norms, in other words – it therefore follows that the success of a given group and "how

[15] Colvin, Geoff. (2018). "What the Hell Happened at GE?" Fortune Magazine, accessed November 8th, 2018 from http://fortune.com/longform/ge-decline-what-the-hell-happened/

[16] The article also writes, "Ask Wall Street analysts, customers, vendors, competitors, former executives, and former directors to explain how GE ended up where it is, and their first words are the same: "capital allocation.""

[17] Thomas, D. (2016) "Yahoo – where did it all go wrong?" BBC News, accessed November 21st, 2018 from https://www.bbc.com/news/technology-35243407

well [it] functions depends heavily on its package of social norms[18].” As Henrich notes, both Adam Smith and Friedrich Hayek have long argued that it is the automatic norm following of our species – not our self-interest or some rational calculation of expected utility – that “often makes us do the “right thing” and allows our societies to work.” Indeed, Culture as Destiny for nations was well brought up by George Yeo at the Khazanah Megatrends Forum 2016.

Furthermore, if the key to continuing the Building of our Collective Brain is for a given group to continuously learn over time and over generations, the question then becomes, “How do we keep learning?” Indeed, are we entirely sure that we are, in the first place, doing enough to learn from our past – and indeed, the collective past of our various communities such as our companies, our nations, and our world – to preserve and build our Collective Brain? Furthermore, if, as we have observed, our Collective Brain can shrink, what have we lost to history as a result of our failure to learn?

The Khazanah Megatrends Forum 2019 looks to explore this question of how we can continue Building our Collective Brain, learning from the past to ensure that we give ourselves the best opportunities to succeed in the future. The applications are many. For instance, with regards to Markets, what have been the consequences of Federal Reserve interest rate hikes in the 70s, 80s, 90s, 2000s on markets, and which of those lessons are still relevant today as the Federal Reserve continues its path of rate hikes?

For Firms, it is becoming increasingly obvious that they have no divine right to continued existence. To illustrate this, the average tenure of a company on the S&P 500 Index has gone from 33 years in 1965 to 24 years in 2016, and is forecasted to shrink to just 12 years by 2027. It is not enough for Firms to simply depend on a static Collective Brain, they must expand it, Exploring alongside Exploiting. But do Firms learn from others as well as themselves as they Explore? What lessons can Board and Management take away from other firms undergoing severe disruption? Are we even aware of these lessons?

From the perspective of economic development, Professor Ricardo Hausmann at the Harvard Kennedy School argues for the increase of Economic Complexity, which is to say the increase of a nation’s collective knowhow – read: Collective Brain – in producing exportable goods of ever-increasing Complexity. Indeed, worldwide, there is a strong correlation between Economic Complexity and National Income[19]. This therefore requires an Industrial Policy aimed not only at producing new things, but producing new things that requires increasing a nation’s Collective Brain.

Yet, as we know, the growth of a nation’s Collective Brain is dependent on its social inter-connectedness; its population must also be able to access that Collective Brain, learn from it and build on it. Yet, to what extent do all Malaysians have the same opportunities to access our Malaysian Collective Brain? Much of social science research has shown, economic and societal opportunities are strongly correlated, especially over time, with household income and wealth, thus widening our income gaps, as demonstrated by

[18] Henrich (2016).
[19] Hausmann, R., Hidalgo, C.A., Bustos, S., Coscia, B., Chung, S., Jimenze, J., Simoes, A., and Yildirim, M. A. (2011). The Atlas of Economic Complexity. Cambridge, MA: MIT Press.

Khazanah Research Institute's State of Households 2018[20]. This creates more unequal access to opportunities in education, internships, travel, social networks and to our collective Malaysian brain. Over the long run, if more and more Malaysians don't have the same types of opportunities to access and improve Malaysia's Collective Brain, our Collective Brain will stagnate and even shrink. Diversity also matters. If everyone shares identical perspectives, it is difficult for the Collective Brain to grow. But to what extent is Malaysia ready to embrace greater diversity at all levels? And to what extent is status quo inertia limiting change and progress, and therefore the development of Malaysia's Collective Brain?

From the perspective of People, it goes without saying that to Build our Collective Brain, we need to also build, as Nobel Laureate Joseph Stiglitz calls it, a "Learning Society." After all, knowledge does not suffer from diminishing marginal returns; the diffusion of knowledge via social interconnectedness makes knowledge a unique factor in economic development. In addition, the diffusion of knowledge is easier than ever today, given the ubiquity of technology, enabling large-scale cross-border communities to interact, converge and blend. The network effect of such platforms – exponentially increased as per Metcalfe's Law[21] – has enabled the Collective Brain to grow by removing the physical, geographical and institutional barriers for collaboration and knowledge exchange. This is especially key for technological development and innovation, where communities of developers and entrepreneurs can learn from each other's experiences on open transparent platforms.

Therefore, how do we cultivate social norms and institutions that encourage individuals to pursue lifelong learning and socially cooperate better by disseminating their knowledge to other members of society? In other words, how do we build social norms and institutions that are more pro-social and inclusive? This is especially vital in a world where Artificial Intelligence may shift the nature of human work and education, forcing humans to constantly delve into new areas or fields to avoid being made obsolete by technology. At the same time, technology may have a pivotal role to play in building our Collective Brain. How do we harness technology appropriately? Finally, while failure is often treated as a great teacher, success is often treated not as a teacher, but a validator. Leaders who have achieved great success in their respective fields are susceptible to being caught in their own hype and be guilty of hubris. Can we develop leaders that avoid this pitfall? Or are we doomed to, as said by Harvey Dent in "The Dark Knight" – "You either die a hero or live long enough to see yourself become the villain."

The Panels

Since the inception of the KMF, themes have been discussed ranging from a shifting global economic climate to a reclamation of the global 'commons' to a new context where uncertainty is normality to the need to generate growth with inclusion in an age of paradox, to whether or not good stewardship based on

[20] The Khazanah Research Institute's State of Households 2018 found that while it is true that relative inequality has been decreasing in Malaysia, as evidenced by a reduction in Malaysia's Gini coefficient, it is also true that absolute inequality has been rising. The income gap between the incomes of the top 20% households ("T20") in Malaysia and the middle 40% and bottom 40% ("M40" and "B40") respectively has doubled over the past two decades.

[21] Metcalfe's Law is a concept used in computer networks and telecommunications to represent the value of a network. Metcalfe's Law states that a network's impact is the square of the number of nodes in the network. For example, if a network has 10 nodes, its inherent value is 100

the political economy of location, environment, and demographics can overcome geography as destiny, to the juxtaposition between Artificial Intelligence and Human Intelligence and most recently, to we can Recalibrate Markets, Firms, Society and People towards a greater sense of Balance.

The KMF 2019 theme is, "From the Past to the Future: Building our Collective Brain." In upholding KMF traditions, panel discussions will continue to be organised along four core sessions: how various markets globally are affected; what the theme means to firms, and society at large; what are the imperatives of leadership and people.

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