How the Future is Done

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Abstract

As technologies and human systems become increasingly impactful and pervasive, unexpected outcomes often leave researchers to perform 'research autopsies' to determine what went wrong. Despite concern around disruptive technologies and the growing complexity, interdependence and volatility of business environments, academics remained oriented to researching the here-and-now and assuming an extrapolation of the present into the future. This research offers "doing future(s)" as a critical research orientation to create discourses of alternative future(s) which our research bring forth. We argue that by engaging in doing future(s), academics provide a critical voice and participate in reframing and recalibrating the futures which we make through collective action. We provide an overview of future-studies approaches categorized by epistemic stance and illustrate the distinctions with a case example. We then describe broad implications for Information Systems research, as well as business practice.

1. Introduction

At the end of WWII, Vannevar Bush fought to ensure that the scientific enterprise did not become a handmaiden of the military it had served so well in wartime. Bush articulated the Soviet science-government experiment as an avoidable potential future. His arguments of the time represent the manner in which narratives can "help us broaden our understanding and explore imagined futures, encouraging us to think about the kind of world we want to live in. In doing so, the future's distance is collapsed" [1].

With a few notable exceptions, the dominant narrative of 'the future' in developed countries is one of robotics/automation, Artificial Intelligence(s) and a simplified technological utopia in which the technological visions of a few serve the masses. This narrative is found in mass media, in advertising, in corporate white papers in politics and even in academia. Absent is a critical voice, and academic participation in reframing and recalibrating current systems activities to enable the emergence of desirable futures and identify values of the present.

That "some" future will eventuate is inevitable: "the future has most definitely arrived... thinking and anticipating the future are essential for almost all organizations and societies" [2 p 1]. This does not mean it is knowable, can be intentionally brought about or determined. What the future is and who gets to define it a contested space that has garnered attention throughout history [2, 3]. For some, the future is a consequence and unavoidable outcome of present choices; others suggest, "the concept of the future that involve only prediction and reaction, rather than the development of goals and progress toward them is incomplete" [4]. In this view the future is something to be created through imagination and choice. But in a temporal sense, the unavoidability of some future state of affairs (even stasis) would suggest that seeing and intending to influence, shape or create a desirable future would be an area of concern for individuals, business and society. Yet "the futures we are getting hardly seem like the ones we explicitly decide on; they are more like the messed-up ones we are drifting unwittingly and implacably into" [5 p.170].

We argue that this is due, in part, to our reduction of a complex and many-sided world to a simplified and controllable thing - what Feyerabend terms the conquest of abundance [6]. Our scientific methods, particularly in relation to future(s) create artificial and impoverished reductions which block-out the social, economic, and political environments in which our new technologies and systems reside.

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It is critical that scholars who focus on the development and deployment of technologies, systems and ways of organizing do not excise the richness of human existence in a living world. The tendency towards reductionist approaches to future(s) obscures the important conversations not about technology in the future, but rather about the *lives and roles of humans* in a technologically saturated world.

The implications of technologies (e.g. nanotechnology, artificial intelligence, Internet of Things), of financial interactions (e.g. high-speed trading, cryptocurrencies) and business models (e.g. the "gig" economy, global interconnections, surveillance capitalism) are of increasing concern for those interested in social, humanistic and environmental well-being. Yet in large part, academics remain oriented to seeing what is the here-and-now or looking to history to theorize the origins of the present. Recent privacy erosions and the manipulation of preferences on platforms such as Facebook are entirely obvious – in hindsight. But other discourses in society, such as Philip K Dick's "Minority Report" and Isaac Asimov's "I Robot" envisioned as "a future" what we now take for granted as our present. These authors explicated the broader implications of technologies and business models on society, the environment, what "a human life" would be like. While these were considered science fiction exercises, a range of future-studies that spans predictions, future planning, foresight and other techniques can be identified. Which leads to the central question of this paper: How can researchers 'see in new ways', so we can understand, critique and evaluate the futures we help shape and bring forth?

Doing future(s) offers a new view point and requires us move beyond current single levels of analysis, primarily organizational or institutional to examine the implications of our assumptions regarding technologies, business models, and practices for the world of which they will be a part. This involves more than implementations or prescriptions but research into possible, desirable, or regrettable implications and how these might inform current decisions.

This requires that we attend to the fullness of the world in which socio-technological innovations and organizational practices have a place and make sense. This moves us into a realm broader than the prescriptions of a particular strategy, foresight regarding a given company's success, or predictions regarding a specific technology. Instead we focus on techniques and processes which enable researchers to rigorously discuss not only what is possible or plausible but also what is desirable as an intended

future. The Information Systems (IS) literature generally takes the future as unproblematic and optimistic. Only rarely are dystopian, catastrophic, extreme but plausible scenarios or alternative future(s) even considered despite calls for greater attention to the effect of ubiquitous technology [7, 8] and well-founded climate modelling outcomes [9]. In examining *doing futures(s)* we illuminate how researchers can help businesses and governments draw out and disclose the world(s) [10] we are bringing forth in our current actions and research.

Businesses, urban planners, government agencies and militaries all propose or forecast future states using a variety of methodologies. Future themes are common in literature, science fiction as they are in advertising, and from institutes dedicated to developing future scenario-planning or foresight. But academic discourse is largely absent. We suggest this is due, in part, to identification of the primary goals of the business disciplines, including science and technology studies, IS, management and strategy, as seeking generalizable truth(s) and discovering the underlying principles of the scientific world. Methods, perspectives and activities are intended to theorize the fundamental principles that underlie human behavior, organizing, and management by peering underneath the ideographic and illusory to discover the unified and law-like principles from which theory is built [6].

Yet one function of theorizing is to produce or control the outcomes of decisions – outcomes which occur in the future. The literature readily reveals an implicit concern with futures through 'best practices', prescriptions, design, and predictive practices. Delphi studies of executives, foresight techniques [11] and the area of data science/analytics [12, 13] are examples where discovering what exists and gaining insights into phenomenon enable one type of future to be seen.

Importantly, these future studies approaches are limited in three ways. First, in most cases they rely on extrapolation of the present to predict the future while simultaneously avoiding determinism and pursuing disruptive innovation. Some of the most influential changes in modernity (e.g. the printing press, the general-purpose computer, the internet,) did not arise in a predictable, linear path from the knowledge current at the time. Second, futures are often narrowly focused on specific companies (e.g. gaining strategic advantage), industry sectors (e.g. finance, telecommunications) or technologies (e.g. autonomous vehicles; machine learning, blockchain). This focus forecloses seeing the lived-world in which such changes make sense. For example, if telework becomes a common organizational strategy [14, 15]

and eventuates for a large part of the population, what are the implications for the fabric of society beyond the psychological factors and organizational challenges mentioned in the cited research? What social, political, and economic norms will emerge in conjunction with this formulation of work? Third, for whom the particular future is desirable is most often unspecified. Data-analytic forms of decision making are increasingly in vogue but the discussions of the well-known negative effects [7] receive far less attention than the objective, equitable world optimistic proponents portray. In many cases reliance on algorithmically-based decisions create a future – when police increase surveillance in some areas based on algorithms, the arrest rate does increases [7] – thus the algorithm must be correct. But while increasing use of algorithmic decision making in the financial sector, employment, medicine, education, and democratic information distribution may benefit some people, it also creates inequalities and groups who are disenfranchised, excluded or misinformed.

In this research we make the argument that IS invokes future(s) as a linear and somewhat deterministic outcome of the present. New critiques, design concerns, and perhaps theorizing can be realized by explicitly *doing future(s)* through a broader array of techniques and perspectives than are currently in use. It is here that scholars and practitioners can turn to novel and bold ways to engage with those futures.

The paper proceeds by presenting a brief historical account of humankind's interest in interrogating the future. We then discuss methods and discourses for *doing future(s)* which are in use by governments, think-tanks, corporations and institutes. We conclude with a discussion of the implications for research and practice and an exhortation that the future is too important to be left to others.

2. Futures in History

Concern with the future is as old as humankind itself. Potential encounters with predators, storms, and seasonal changes captured the attention of early civilizations. Forms of future-telling including oracles, prophecies, and various divinations have been prevalent across historical societies and still capture the common imagination. From planetary alignments to casting bones, from tarot cards to tea leaves, humans have sought to know the thereby control, or avoid, future(s) [16-18].

Studying the future is not new and businesses engage vigorously with techniques to interrogate the implications of futures based on what action possibilities were observed in the present time. In Western societies modern futures studies have emerged after WWII and have been influenced by the historical, social and philosophical contexts in which they developed (see [3] for a review of the historical periodization). Initially the focus has been on scientific inquiry and rationalization of futures, focusing on technological forecasting, modelling, scenarios and statistical tools. In the 1960s, 70s and 80s futures studies emerged as global institutional norms and became an important tool for business communities. Since the 1990s there has been an increasing narrowing and fragmentation of future studies, with a focus on specific technologies, projects and organizations, and an emphasis on strategic planning and risk reduction. This historical account illustrates that future-studies are not new, but with few exceptions, the interest of management and IS oriented academic literature has narrowed at the very time when rapid technological change, environmental tipping-points and economic/social inequalities are roiling business, societies and global institutions.

The previous analogy to post-WWII arguments for the production scientific knowledge to remain independent of government control [19] highlights that, while current choices for technology development are relatively independent of government oversight, patronage now comes from business investment with the inherent expectation of financial returns. A question that arises is who owns the future? Increasingly businesses have taken a dominate role in the technological development and implementation which are both pervasive and invisible. The lived experience and quality of the futures thus created are dependent on the hope that corporations will proceed with social and environmental concerns as a primary goal of business models and technology.

Only by engaging in doing future(s) can academics provide a critical voice, to paraphrase Aristotle's Rhetoric "into the things about which we make decisions, and into which we therefore inquire [and] present us with alternative possibilities" [20]. This is perhaps more critical at the current time as widely implemented technologies become inscrutable even by those who design them, as we lose sight of who and what is controlled by those technologies and businesses take a greater role in organizing our live and shaping our knowledge and preferences.

3. Approaching the Future

Numerous metaphors for the future underlie and shape the epistemic stance in the variety of future studies which can be assessed. The future has been likened to a foreign country in which we are always arriving but never quite sure where we are. It is considered a book yet to be written, or a journey we must navigate [4]. Others maintain the future is an existential action of making in which materialities push back on the human intention in the co-constitution of a world [21]. The epistemic stance revealed in various metaphors has implications for whether futures are predicted, discovered, created/built or socially imagined. What is consistent is that individuals, institutions, businesses and governments all anticipate, plan for and pursue the future as a mainstay of their varied agendas. But despite enormous efforts at planning, prediction, and control, "futures are unpredictable, uncertain, and often unknowable, the outcome of many known and especially 'unknown unknowns'" [2 p.1]. This observation raises valid questions about the place of future studies in academic research – if it cannot be known what is the point of research? But large institutions (e.g. the Intergovernmental Panel on Climate Change, the European Strategy and Policy Analysis System), the RAND corporation, and governments (often in the form of military agencies) have developed and successfully deployed various anticipatory discourses and techniques which provide exemplars of how seeing the future(s) in alternative configurations reveals contested space, conflicting interests and the ideas and values which are important both in the present and the future being created.

The lack of engagement with futures places business academics in a reactive stance, waiting until something changes (e.g. GFC, artificial intelligence, nanotechnology, the 'gig' economy) to study what, for better or worse, has just occurred. The dominant narratives about the world we can have and should desire are left to be shaped by business leaders, celebrities, cultural gurus and business-controlled online-bots and algorithmic influences. Missing from these discourses is an intergenerational perspective such that the interests of future generations are not burdened with outcomes those currently alive would not tolerate.

One set of distinctions which can underpin doing future(s) has been represented as Cones of Futures (Figure 1) [22]. What is illustrated here are the distinctions between what is possible given the current state of technological and scientific knowledge, what is plausible within the constraints of governmental, societal and economic circumstances and what is probable in light of political and economic realities. Of note in Figure 1 is the area deemed Preferable as this requires a discourse not about what will or could be but rather about what values are at stake and who we, and our children, will become.
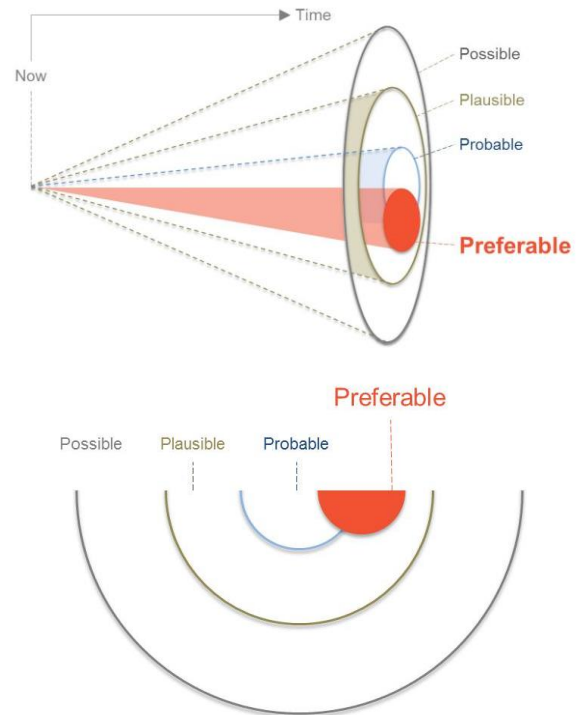

Figure 1. Cone of Futures (adapted from [23])

Figure 1 reinforces the indeterminacy of any given future and highlights the important role for research in articulating desirable futures through critical interpretation of corporate and governmental narratives regarding technological and policy innovations. But it also misleads by presenting the future as a linear projection from the past (and thus back into history). Research in megatrends [24, 25] and socio-technical innovation [26-28] indicate that historicity and path-dependencies have a strong influence on possible futures. The future is not an empty context free place for exploitation. The materialities of infrastructure, information [29], organizational routines [30], social structures [31] impose constraints on what can change and how fast change can occur. But non-linear business and societal disruptions can be identified in hindsight [32] often concurrent with technological innovation. Envisioning possible discontinuities requires techniques not often utilized in business as usual research. In addition, the diagram suggests that all peoples at same point in calendar time have similar paths in the cone of futures. But this temporal

homogenization ignores the very real differences among cultures, age groups, national socio-economic position and resource availability that can be distinguished in the world at large. The path ways to any future are neither linear nor predicable. Different contextual starting points follow different path dependencies and concurrently involve emergent (thus unpredictable) phenomena and both intended and unintended consequences.

4. An Epistemic Categorization

As we have noted, numerous techniques, approaches and discourses have been developed within the class of future-studies in past decades. They vary in underlying epistemic assumptions and commitments, complexity, time commitment, and function. The following categories group commonly seen approaches by their assumptions of what the future is and how it can be productively discussed. These categories are not meant to be exhaustive but rather sufficient to make the point that a variety of futures studies approaches in different fields have fruitfully engaged in discourses and practices. It is beyond the scope of this article to thoroughly review each of these techniques/ methods. It is important however for us to highlight that academia has limited its engagement to a subset of techniques of limited scope and breadth. The academic discourse is dominated by predictive and normative approaches which assume the future is determined by present conditions. Given what is at stake we suggest that "technologies, like the people who use them, have social lives and so one must imagine the social futures as well as improvements…" [4 p. 14]. Future-making, imaginaries and speculative perfect /imperfect futures serve to collapse the unknown into a focus for discourse. Imagination in this sense is not a flight of fancy, an elite pastime or mere contemplation but has become "a form of work (both in the sense of labor and of culturally organized practice) and a form of negotiation between sites of agency ("individual") and globally defined fields of possibility" [33 p.50].

4.1. Discovering the Future

The methods in this group assume and evoke a future that exists and can be discovered. They are representative techniques commonly found in IS research. The future explored is a quantitative and/ or qualitative extension or extrapolation of the present/past. These methods also make the implicit assumption that current explanations of phenomena are stable. They either provide prediction or alternative, plausible futures and normative guidance.

They assume that good data or information from the present will enable largely direct and linear extrapolation to the future; association, causality and directionality hold in the future. They can be narrow in focus (e.g. on a specific technology, a company or sector) and rely on the quality of the data (for data-analytic techniques) and the expertise of informants. But they can also look quite broadly at the future performance of entire sectors, countries or economies and are valuable for identifying what problem/ issues experts foresee as important in the short-term [e.g 34]. Such future-studies techniques are frequently used in IS research.

4.2. Future-Making

These approaches imply a future that is created through choice and action. These are human-oriented interventions to address poorly understood, ill-defined, 'wicked' problems [35]. These approaches destabilize current assumptions and our current social and technological trajectories but are still grounded in current understandings of phenomena, assumptions, connections, and principles.

Future-making spans a range of techniques, including antagonistic scenarios and thought experiments which ask how "it could be otherwise". Some are more purely concerned with problem solving, with or without an explicit commercial focus, some more broadly concerned with speculative approaches to difficult, contested technologies, social, and economic practices. They also range from thought experiment constructions to product, service or experience re-designs [e.g. 36].

4.3. Socio-technical Imaginaries

These approaches assume the future is actively imagined and are enacted if they are socially accepted. These take a radical departure from the previous two groups and use active imagination to encode what is possible through technology, business and shared social vision [19, 37]. They implicitly un-frame current realities and connect innovation in science and technology to power, social orders and justice [e.g. 38]. Un-framing in management and IS sciences concern how "it comes to be", rather than "what could be". The focus is on narrative, around retelling the story of 'what is' alongside the story of the new, in order to enable the necessary shared social vision.

4.4. Perfect/Imperfect Futures

Utopian and dystopian fictions in this group involve radical extrapolations or vivid imagination to expose values in the present. They highlight ideals and values as enacted in perfect worlds – or the opposite – anti-perfect worlds. Rather than reflect the values of the designer, they aim to expose perceived or emerging values in the world. They allow us to inhabit fully realized worlds [e.g. 39] and experience the trade-offs that competing goals that technology, business, and society inevitably bring about.

5. Doing Futures: An Illustrative Example

Steven Spielberg's 2002 movie Minority Report (loosely based on P.K. Dick's short story of the same title [40]) focuses is on how society uses technology. "Imagine, a world without murder. 6 years ago, the homicidal rates had reached epidemic proportions. It seemed that only a miracle could stop the bloodshed, but instead of one miracle, we were given [the ability to predict crime]. Within 3 months of the pre-crime program, the homicidal rates in the District of Columbia had reduced 90 percent." The predictive algorithmic technology that frames the future police program also inhabits the rest of the world of Minority Report. For example, shops recognize customers and their previous purchases through face/retinal scans and use location-based influence algorithms to push new purchases.

Minority Report allows us to inhabit to trade-offs and the ethics of a surveillance state interconnected with modern business models of "attention merchants" [41]. The narrative reveals tensions between what individual's deem to be "privacy", the societal need for safety and security, and the corporate mandate to monetize data. The original story and the subsequent screen adaptation (2002) came long before current ubiquitous technology, the use of algorithms, and machine learning which have enabled a range of platforms and consumer services to influence our social, material, political and economic lives. As a dystopian future, the story surfaced many of the tensions and social implications realized in our current world of iPhones, machine learning, workplace analytics, and the ubiquity of data collection and influencer algorithm platforms like Facebook and Twitter.

Today, the place that a particular socio-technical platform – Facebook – has come to occupy in the world reveals a conflicted space that was neither unimaginable nor unforeseeable. The algorithms that enable Facebook to connect people and predict their social interactions are also tasked with optimizing clicks of material to make the digital-advertising model profitable. This creates a digital-world in which popular but not necessarily beneficial or even true material is recirculated, amplified and provided credibility. The proliferation and reinforcement of both new and long-standing propaganda (e.g. fake news), discrimination, and exploitation are foreseeable but previously unknowledgeable effects of its business model. When algorithms magnify existing perspectives the implications were always going to play out in the larger culturally and historically loaded societal fabric where people, organizations and governments can leverage it for economic, political or social advantage.

The practices associated with capitalizing on (big) data as well as their challenges to privacy and self-determination were laid bare in Minority Report. In the world of dystopian novels such as "The Minority Report" [40] and "1984" [42], the distribution of "fake news", manipulation of beliefs, data-veillance, location-based predictive marketing and data-driven influencers were not prophesized – they were imagined. Such worlds with their richness and emergent values and logics are however largely absent from academic discourse. By focusing on the here and now academics are overlooking new questions to ask.

6. Discussion

Doing future(s) provides a means to return the richness, values, and humanistic discourse to social science disciplines in their endeavor to improve the human condition. Narrative approaches can augment and fill in the gaps of more restricted future(s) studies approaches by challenging the *ceteris paribus* assumptions which accompany predictions, scenario building, and forecasting techniques. We have highlighted a new 'way of seeing' by reconsidering the assumptions that underlie the focus of current IS research and offering a well-grounded and productive research approach that open space for new questions. These approaches enable research into the possible, desirable, or regrettable implications and exploration of what we value today and how imagined tomorrows can be obtained.

Doing future(s) is based on a rich tradition in the organizational world, and some future studies approaches are widely used by technology companies, in financial forecasting, product development or brand exercises. The general class of future studies has also been the subject of a body of work in other subject areas (e.g. political sciences,

philosophy, future studies, and speculative fiction) where the idea of fictional realities allows researchers to access, inhabit, and explore the possibilities of divergent tomorrows. Doing future(s) facilitates theorizing across disciplinary boundaries by specifically taking up aspects of social practice.

Such intended futures traditions are also present in the sciences. There is a rich body of discourses of fictions (e.g. useful fictions, fictionalism, multiverses) [43-45]. Rather than purely access and exploration, here they also serve as a tool for imagination, of how worlds would re-arrange (or would not) around new tools, technologies or the practices they enable.

For example, the British series Black Mirror explores the multifaceted (e.g. social, cultural, political and economic) implications of today's technologies and emerging business models. For instance one episode, 'Nosedive', plays out in a world where people can rate each other from one to five stars for every interaction they have throughout their day, and which can impact every aspect of their lives, from what car they rent, where they live, to where they work and how they socialize. This allows us to inhabit the worlds that are currently being brought into being by initiates such as China's Social Credit System but also enabled by global multinationals and their business models that enable monitoring and rating of anything and everything from tagging you in images to rating accommodations, businesses and professionals.

Utopias and dystopias have been a tool for academics ranging from social sciences and political studies to natural sciences. In management, information and service sciences, utopias and dystopias would enable us to expose values and to present the trade-offs that competing goals in business and society inevitably bring about. Bauman, [46 p.11], highlights the value of utopian approaches "to measure the life 'as it is' by a life as it should be ... is a defining, constitutive feature of humanity."

Doing future(s) thus also becomes a valuable approach to identification of the values and concerns in present day life. Philosopher Susan Neiman (cited in [23]) argues that reality should be measured against ideals not *vice versa*: "Ideals are not measured by whether they conform to reality; reality is judged by whether it lives up to ideals. Reason's task is to deny that the claims of experience are final – and to push us to widen the horizon of our experience by providing ideas that experience ought to obey." Multiple approaches also help meet and realize the proposed vision of business schools' research in service of society (e.g. the Responsible Science in Business and Management project across

accounting, finance, management, marketing, and operations, promoted by global institutions such as AACSB, EFMD, and UN Global Compact). George [47 p.1875] stresses how "such efforts highlight the changing mindset in business schools of moving toward research with impact, and showing evidence of having had impact on business and society". Both environmental sustainability and human well-being would be well served by exploring ideals and pushing ourselves to 'widen the horizon of our experience' through methods like speculative design, fiction and radical imagination and extrapolation to inform practice.

In addition, doing future(s) provide a useful way to explore and potentially overcome the often limitations that arise from attention to specific levels of analysis at the expense of others. Focus on a single level of analysis, whether primarily organizational or institutional can result in opposing goals at individual versus institutional level. Development which can be sustained across generations and within planetary thresholds requires grounding in systems thinking, across levels of analysis, across time and across space, [48], and hence require approaches that can explore these dynamics.

Most importantly doing future(s) is necessary because the potential severity of current trajectories (e.g. inequality, planetary thresholds, social unrest, technological risk) that we are faced with now. The challenges they might pose are inadequately anticipated and debated by international organizations, governments, business and public media. However a large part of the debate is shaped by short term views of market led, narrow approaches or extrapolations of the present/past. Management researchers have the opportunity to contribute and become an influential voice.

In such complex socio-technological contexts, we must remember that the narratives and debates about futures are nevertheless continuing with consulting firms offering to future proof companies, to help executives navigate the unknown. We have argued that only by engaging in doing future(s) can academics provide a critical voice, and participate in reframing and recalibrating the future.

Looking at the four categories that we have discussed it is easy to see how scholars (and indeed IS scholars) are active alongside practitioners and organizations using techniques that assume the future exists and can be discovered ('Discovering the Future' methods). Scenario thinking was developed through work at the US Military and further developed with regard to strategy at the Shell Corporation. 'Future making' methods, where the future is created through choice and action, also

feature numerous practitioners, organizations and think tanks and well as military and government. Scholars in sociology, political science and the arts are represented; less so IS scholars. There are now calls to engage with design methodologies in major publications (see for instance [49]). But the last two categories, 'Socio-technical Imaginaries' and 'Perfect/Imperfect Futures', where the future is actively or radically imagined, are almost entirely part of commercial or artistic discourses.

Although IS scholars are concerned with topics that invite a consideration of a future that is actively imagined to encode what is possible through technology, business and shared social vision (e.g. grand challenges, the future of work, organizational resilience, design thinking, big data, paradoxes), work and calls for fresh areas of scholarly enquiry overlook preferable future paths and favor the possible and the probable. Recent editorials on Big Data [50, 51] encourage broader discussions of big data in society and its implications. However the explicit focus is on the benefits for systems sponsors (e.g. corporate implementations) and research that should identify correlations and plausible causality, and work towards consilience. These editorials' concern is with the micro of organizational strategies, not on developing the narratives that would enrich discourse regarding where, when and whether such technologies should be deployed.

The origins of this paper also lie in the authors' experiences exploring the future of business. A project with state government researching the implication of automation and artificial intelligence of the future of education revealed that as IS academics we have limited ways in which we engage with the future. As the collaboration between a number of faculties (including engineering, education, sciences and health sciences) the project also revealed the central role business research as well as business practice can play at a time when technologies and businesses take an increasing role in organizing our lives and shaping our knowledge and preferences. Moreover, reflecting on our experiences with teaching in postgraduate and executive programs we experienced firsthand not only the limited toolset we provide in business schools but also the need to directly address students' mindsets to break away from extensions/extrapolations of the present and short-termism.

We also recognize the difficulties inherent in such future(s) work. 'New ways of seeing', especially those steeped in practice, find it difficult to gain momentum in academic research and mainstream publications. For example, despite repeated calls for management scholars to address the opportunities for theory development and empirical work (see for instance [49], design thinking has not made significant inroads into IS or management theory.

We need to ask ourselves how we should best prepare the leaders of tomorrow, whether they are students or practitioners, to be able to best create a better world. Business schools can become platforms for intending, re-imagining, experimentation and speculation about the future. We can open the door to generate futures that engage public debate about the futures we desire.

It is thus critical that such research occur on strong foundations, lest we risk making things worse. We need to more thoroughly investigate and evaluate how well the list of methods and techniques we highlighted in this paper are suited to IS research, develop them, understand criteria for excellence, and integrate them into the rich strands of discourse we already have as a community.

7. Conclusion

We have argued that by engaging in doing future(s) researchers can provide a critical voice and participate in reframing and recalibrating current technology developments and implementations that may enable the emergence of desirable futures and identify values of the present. We believe it is critical that such work be part of the community of scholars whose focus is on the development and deployment of technologies and ways of organizing that constitute organizational life. It is here that many of the important conversations bearing on the future occur and it is here that scholars and practitioners turn to novel and bold ways to engage with those futures. There are current publications that only address futures research (e.g. Futures: The journal of policy, planning and futures studies). We believe IS research and practice are best served by not separating futures discourses from the central discourses of the IS community. When futures approaches are not sufficiently part of central discourses, it is difficult to catalyze public and business engagement with such scholarly work (e.g. the debate surrounding O'Neil's provocative "The Ivory tower can't keep ignoring tech" [52] suggesting academia is not engaging with the huge influence algorithms and machine learning that are creating the way we live and work).

The future is not something to be predicted, but something to be made. We will all dwell in a future arising within the activities with which we engage. By augmenting traditional future studies with *doing future(s)*, we focus attention on the meanings which

accompany our technological gadgets and our omnipresent gods. This is perhaps more critical at the current time as widely implemented technologies become inscrutable even by those who design them, as we lose sight of who and what is controlled by those technologies. If we are constructing our future through our present action and research [53, 54] we should perhaps, take great care and have caution.

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