Emerging business models and implications for the transport ecosystem

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ABSTRACT

This paper summarises our findings from discussing emerging business models in transportation. Going well beyond big data and regulatory issues, we also examine how new and emerging business models, leveraging on advances in digital technology, can enable more efficient, consumer centric and viable transport provision. One popular emerging solution is mobility as a service (MaaS), and we discuss both tension and partnership potential among government, operators and service providers. New disruptive models and market entrants as well as definitions of success, changing customer expectations, scalability of business models and the role of asset ownership are also shown in various case studies to shape the nature of future transportation ecosystems.

1. Introduction

The real-time optimisation of the movement of goods and people is a rapidly growing trend enabled by smart devices and big data. The ubiquity of the smartphone has enabled instantaneous sharing of location information and a multitude of mobility as a service (MaaS) solutions (see for example, Merkert et al., 2020). Big data also allow the development of a very detailed profile of customer preferences, enabling myriad bespoke combinations of services, including, but not necessarily limited to transport provision, to be packaged to the end-user. Such abilities have given rise to emerging business models that could greatly transform the transportation sector, both private and public. This transformative potential has spurred companies ranging from app developers to car manufacturers, to invest in this new mobility space. This creates both opportunities and challenges for governments and mainstream operators. On the one hand, such technologies enable real-time and dynamic feedback, presenting opportunities for operators and authorities to shape behaviour using data and real-time optimisation of travel plans. On the other hand, such innovation is often driven by the private sector, and some might say venture capitalists, which begs the question of how this space should be governed, for example in policies encouraging the growth of novel solutions and in the need for an optimal public-private integration framework to achieve better societal outcomes.

This paper provides a synthesis and systematic overview of the outcomes of the workshop Emerging business models and implications for the transport ecosystem as part of the 2019 16th International Conference on Competition and Ownership in Land Passenger Transport (known as the Thredbo series). In many ways, this workshop had its genesis at Thredbo 15 (2017 in Stockholm, Sweden), with its dedicated workshops on the “ubersisation’ of public transport” (Yap and Munizaga, 2018) as well as “big spatial data and data analytics in the digital age” (Mulley and Kronsell, 2018). These workshops noted that the main challenge in implementing big data-related solutions was institutional rather than technical, and new market entrants and models of service provision resulted in both tensions and partnership
opportunities amongst government, operators and service providers. This demonstrates the currency of Thredbo themes as a 30 years old conference with its traditional focus on public transport contracts and institutional reform continually evolving to adapt as shown by the discussions and outcome of this present workshop on emerging business models.

One overarching theme is governments’ growing appetite to think beyond standard procurement procedures with growing pressures on the public purse, technological advancements and the desire to improve customer service. There is an increasing desire to bring together the best elements of competitive tendering and economic deregulation, such as innovation. There is also the challenge of regulating the many transportation network companies (TNCs) which have entered the fray in recent years, and to ensure that their presence is consistent with societal objectives that go beyond the current lack of profitability (and hence long term commercial viability) despite their often very significant stock market valuations. The development of the mobility as a service (MaaS) proposition is also a hot topic, including ways to develop this through new business models and new contract specifications. The role that technology plays to enable this new state of affairs (as well as the risks that they might entail) is another topical issue. These trends and ideas form the motivation behind the development of this workshop.

The workshop consisted of 17 participants (plus a chair and rapporteur) representing seven countries and a range of stakeholders including academia, government, operator, industry association, consultancy and media (see Appendix for a list of participants and affiliations). A total of 12 technical papers were presented, each accompanied by in-depth discussions with the whole workshop. The main focus of the workshop was moderated discussions on theory and practice around the workshop theme, followed by a co-creation process to develop research, managerial and policy recommendations, including informing the agenda for Thredbo 17 in 2021, all of which we will summarise below. The remainder of this paper is structured as follows. Section 2 reviews the twelve presented papers grouped under three broad topics of interest. Section 3 synthesises the workshop discussions held during the three days, categorised under key topic questions. Section 4 proposes a research and policy agenda, identifying existing knowledge gaps, recommendations for government and governance, and helping to inform future Thredbo discussions. Finally, Section 5 concludes by taking a broader view on how business models and transport ecosystems relate to wider transport and societal objectives.

2. Review of presented papers

The presented papers may be grouped into three broad foci: (i) setting the scene, which covers the broad changes occurring in the transport sector, covering new market entrants and drivers of change; (ii) mobility as a service (MaaS), presented as a popular model for the development of future transportation; and (iii) specific services and technologies, offering an evidence base for constituent components of emerging business models and services.

The workshop consisted of a total of three setting the scene papers. Firstly, Brown (2019) offered a very high level view of the changing mobility landscape (prediction and adaption), centred on debunking a lot of the hype driven by technology giants and media personalities, how transportation only plays one small role in their business models, and some of the follies of modern technologies in terms of adverse impacts on the poor and disadvantaged (“technology favours tyranny”). Subsequent discussion established that the business models in transportation should not just aim for profits but also account for family and community identity as well as intrinsic motivation. Wilson and Mason (2019) covered the range of new market entrants in the transport sector and reflected on the role of government in this future. Under the intriguing assumption that the real disruption is still to come, specific consideration
was paid to how government can enable competition through reforming subsidies, mode-agnostic franchising and facilitating access to essential services like public transport ticketing and transaction platforms as well as road infrastructure. Lowe et al. (2019) employed a case study of the bus industry in the state of Victoria (Australia) to explain the changing dynamics of the bus industry in the face of new competitors like ridesharing and carsharing. The paper explained how the voluntary professional association (or industry representative body) can help enable change by leading the development of a digital platform with which member operators can ‘plug’ in to provide demand-responsive transport (DRT or microtransit) services.

This integration of fixed route and DRT is often described as a precursor to mobility as a service (MaaS) - a popular model providing a multimodal, one-stop shop digitally unifying trip creation, purchase and delivery. In that context Lee et al. (2019) explored MaaS and its role as part of Singapore’s smart city agenda. Of particular interest in this collaborative ecosystem is the clear definition of the role of different stakeholders, as well as cross-cutting issues around fare structures and data analytics. Wong et al. (2019) developed the idea of the MaaS broker or aggregator which brings together specialised businesses like transport operators, financial enterprise and technology providers to offer multimodal mobility services on a subscription (or pay-as-you-go) basis to end users. The authors designed a stated preference survey administered on an international sample of business leaders which informed the design and specifications of such business model most likely to be supported by industry stakeholders. Sharmeen and Meurs (2019) drew on institutional theory to study intra-firm transitions from traditional to flexible public transport. A case study of an operator in Nijmegen, Netherlands was provided to illustrate business model features during three distinct phases of transition. Bushell et al. (2019) considered transport integration and broker free MaaS through the lens of enhanced operator collaboration and integrated ticketing systems which at present are confined to public transport modes. The authors suggest that great value can be extracted by extending them to other modes and geographies to entice users away from the private car.

There were a total of five technical papers examining specific services and technologies. Berrada et al. (2019) explored the implementation and diffusion of autonomous vehicles via a study of users’ acceptance and operators’ profitability. Cluster analysis was used to establish the most likely adopters on the demand-side whilst technical and economic indicators on the supply-side considered performance in different geographic and operational contexts. Mehta et al. (2019) explored autonomous vehicles in the context of quantifying their potential benefits. The authors discussed various methods to do so including through use of modelling and simulation techniques (including through a revolutionary 3D digital clone of the city) with one of the key findings being that the main issue of automated vehicles is a transition period where algorithms need to account for non-rational decisions of human drivers with whom automated cars will share road space initially. Chua et al. (2019) also offered a methodological contribution by describing an activity-based technique to analyse the relationship between urban activity and mobility. Specifically, the authors identified big data and visualization can help to better understand how land use mix, location accessibility and peak-hour travel demand influence commutes by ride hailing and public transport. Mateo-Babiano et al. (2019) offered a developing country perspective in terms of the formalisation of the jeepney industry in the Philippines. A thematic analysis was conducted to identify the key transitory issues in this process. Finally, Vu et al. (2019) estimated the traffic, economic and environmental impacts of a rural ridesharing program (essentially, application-based hitchhiking) in Switzerland. An important finding is the complementary nature of ridesharing and public transport.

The twelve technical papers covered a variety of international locations and methodological approaches. Both international studies or non-area specific work were undertaken, as well as
the many case study type papers based on data or the context in the countries of Australia, France, Netherlands, Philippines, Singapore and Switzerland. In terms of methodology, there were a number of think pieces and conceptual papers, as well as empirical studies using both qualitative methods (Sharmeen and Meurs, 2019, Mateo-Babiano et al., 2019), as well as quantitative. For quantitative papers, stated preference was a popular approach to study a business model or service not yet available in the market (Wong et al., 2019, Bushell et al., 2019, Berrada et al., 2019). Simulation models and other advanced analytical techniques were also represented (Chua et al., 2019, Vu et al., 2019).

3. Synthesis of workshop discussions

3.1. Identifying a definition: What is a business model in the transportation context?

A major omission identified following the presentation of the twelve technical papers was that none of the presentations had defined the core workshop theme of what constituted a business model, despite many making fleeting references and the idea being floated time and time again during discussions. It was clear that a single definition would be difficult to identify and would likely vary amongst the many international and stakeholder perspectives represented amongst workshop participants. To this end, the chair and rapporteur ran a co-creation process to draw the diverse range of perspectives together. Workshop participants were asked to anonymously submit their definition of business models via an online polling platform, with text mining software subsequently used to identify which keywords were used as part of the definition most often (Figure 1). What emerged was revealing in that money/profit did not appear to be central to the definition, but rather the idea of value was found to be core. This central theme of value included both the value to one’s own business, as well as social value which also featured heavily in the discussions. Related ideas of long-term vision and strategic intent (as opposed to day-to-day focus) were also identified.

Figure 1: Workshop 3’s definition of business models, developed through a co-creation process

Linked to these definitional discussions was the second part of the workshop title around transport ecosystems—specifically, its difference with business models. Whilst business
models lay strictly within the boundaries of one’s firm, an ecosystem described the broader network of actors (including constituent businesses) within a broader framework of agents. It was agreed that a business model was hence just one component of a transport ecosystem.

3.2 What are the successful business models now and into the future? In search of the holy grail

Identifying the key components of successful business models was perhaps the underlying (implicit) purpose of this workshop (hence the search for the holy grail). What does a successful business model look like? What are the key ingredients for this success? The workshop agreed that the answer to these questions depended very much on how success was defined. This definition was context specific, and contingent on stakeholder (including company size and ownership structure), spatial context (metropolitan vs. rural/regional), as well as temporal definition (short vs. long term). As an example of the latter, loss-leading businesses like Uber have lost money continually but still remain very successful in attracting venture capital funding.

In many cases, it is the lack of clarity around the mission, vision and purpose of an organisation that precludes success. Internal organisational issues were discussed as barriers to clarifying this vision, as well as different approaches to defining what constituted success (objectives which transcended individual organisations). For example, one goal could be to develop a dynamic (as opposed to static) business model that can adapt to changes in circumstances. This is linked to the idea that the biggest disruptions in the transport sector (discussed in following sections) are yet to come. Another definition related to sustainability which went beyond environmental and financial viability but also the ability for a business to reinvest in the community at both local and global levels. This is linked to the key themes of viability, resilience and tenure. Finally, the question was posed (but answer not necessarily forthcoming) on whether successful business models can even exist.

Having discussed what constitutes success (or otherwise), the workshop turned to some management strategy theory behind various business models, with a number of key categories put forth in Table 1. The need to identify an organisation’s competitive advantage was raised, together with the ‘all in’ approach to pick one and not be stuck in the middle. Trying to do all things at once meant that one could not do anything well.

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cost</td>
<td>A pricing strategy</td>
<td>Low cost carriers in airline and coach industry</td>
</tr>
<tr>
<td>Complementary</td>
<td>Generate value and extract revenue from related goods/services</td>
<td>Free public transport but money made by adding complementary services or monetising big data</td>
</tr>
<tr>
<td>Differentiate/Niche</td>
<td>To have competitive advantage in the market; quite often works where there is niche market on the demand/supply side</td>
<td>DRT concept using idle school buses during non-school periods</td>
</tr>
<tr>
<td>Hybrid</td>
<td>Often most dangerous of all since might end up in situation where one is stuck in the middle</td>
<td>Could MaaS sit here since it is trying to do too much?</td>
</tr>
</tbody>
</table>

A case study was discussed in detail around the context of the private bus industry in Australia. Bus Association Victoria (BAV), as the peak industry body representing Victoria’s bus
operators, manufacturers and suppliers, saw their value proposition as being providing tenure and viability for their bus operator members. The Australian bus and coach sector has seen rapid industry consolidation and an influx of foreign multinationals in the market (Wong and Hensher, 2019). Many mergers and acquisitions have taken place over the past two decades, with a large number of traditional family-owned businesses pressured to exit because they are less equipped to compete with larger players, being unable to reap economies of scale/scope. New contracting regimes have also meant that much of the brand and identity tied up to these incumbent operators have been lost, making competing operators far more homogenous and a far greater focus being placed on price in the tender process.

This has links to industry consolidation in the developing world like the Filipino jeepney industry, where operators’ branding of vehicles (hailed as an “extension of their home / all they’ve known their entire life”) are being lost in new fleets, as explored in Mateo-Babiano et al. (2019). The BAV hence has the stated objective to keep their members in business and if they wanted to exit the industry then to exit on their own terms (Lowe et al., 2019). The BAV has hence developed a tool called Get There, as a co-operative business opportunity to help their member operators digitalise, better “sweat their assets”, and optimise their service provision by delivering DRT. Often, member operators may be too small to cost-effectively procure their own digital platform. Get There has a rural/regional focus which is a market where foreign multinationals are relatively less represented with their immense resources (including the ability to internally cross-subsidise) and sheer market power.

3.3 What is the role of ownership in business models?

One of the recurring themes of the Thredbo 16 conference was the role of ownership, first sparked by the Managing Director of Go-Ahead Singapore who in the opening plenary remarked how fantastic is to was to operate in the asset light bus contracting model (BCM) of Singapore. One is reminded of many other asset light business structures which have prospered in recent years, in transportation (such as Uber and other TNCs), as well as other sectors like media (e.g., Netflix), hospitality (Airbnb), education (Italki), financing (Kickstarter), the labour market (TaskRabbit) and property (BRICKX)—many built on the peer-to-peer model of the collaborative economy (the “everything as a service” mentality). In the railway and airline markets, vertical separation has brought about new business opportunities for rolling stock leasing companies (ROSCOs) and aircraft leasing companies (some of which have even ventured into operations through ‘wet leasing’—e.g., HiFly). Holding companies (e.g., MTRC, International Airlines Group) are another product of recent trends and developments in ownership and business structures, and are a way of managing risk and maximising returns (Merkert et al., 2020).

The merits of the government ownership of brick and mortar and vehicle assets in the public transport sector (particularly bus) caused great contention and debate amongst workshop participants. The impetus for government asset ownership is often driven by the desire to lower the barrier to entry and to maximise the available number of interested bidders in a competitive tender. This has certainly been the motivation for the BCM in Singapore (Goh and Swee, 2017). Sometimes, the desire for greater standardisation and integration also comes into play (e.g., in Australia). However, it was also argued that public ownership may stifle market pressures and innovation. A key question is whether it is desirable for government to hold such assets on its balance sheet. The contrary view was made that businesses are not just built on financial returns but return on capital as well—the latter of which cannot be

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1 The standardisation of fleet liveries and customer information is motivated by the need to increase integration of the network in the eyes of the travelling public, as well as to aid contract transitions between operators.
extracted under government asset ownership. Again, a case study of the bus contracting experience in Victoria was discussed, along with the role of the BAV.2

One of the major issues which is likely to grow in coming years concerns the relevance of bus operators in terms of the value add or proposition they bring to the bus transport ecosystem. The present trend has seen de-risking on both sides of the operator in the value chain: on the manufacturer side with vehicles-as-a-service and the ever advancing (digital) capabilities of buses with many defects/maintenance requiring the expertise of the original equipment manufacturer (with links to new technologies like autonomous and electric); and on the government side with the government ownership of assets and management contracts. In some markets (e.g., Singapore), government even manages the hiring and training of bus captains (through the Ministry of Manpower and Singapore Bus Academy). In Darwin, government even undertakes crew scheduling and development of rosters for their contracted bus operators. Bus operators therefore become nothing more than an organiser of labour and are vulnerable to being squeezed out of the transport ecosystem (e.g., think a bus manufacturer putting drivers on their products and suddenly being able to take the role of a bus operator). There are many parallels of such developments in other sectors where such ‘middlemen’ have failed to adapt and hence been disrupted out of the sector—e.g., Blockbuster, Borders, Kodak. There is hence value in bus operators maintaining some risk (those they are best placed to take up and turn into innovative products and processes) and the ownership of assets like depots and buses is critical to this.

Linking back to the Singapore case, there exists the classic case of correlation versus causation (and related to the next sections on applicability and scalability) in terms of how much of the success of the BCM may be linked to its particular asset ownership model. The workshop concurred on the view that the Singaporean context was very different to other locales with its very forward looking authority which had adequate money, resources and capability. Government ownership of assets allows quicker technological adoption (with links to asset life) which other jurisdictions simply do not have the appetite for. As such, it is clear that the particular objectives and underlying context comes into play in terms of determining what asset ownership approach is most appropriate. One workshop participant offered up the infamous French general quoted as saying, “There go the masses; I must follow them, for I am their leader”. Clearly, what is required is not a myopic, blind pursuit of a process goal (of a contract specification) often driven by dogma and ideologism, but a better appreciation of nuance in ensuring that context-specific institutional structures are put in place, guided by clear end goals.

3.4 Do business models apply across modes/sectors?

One of the specific contextual variables affecting the application of business models is that of different modes and sectors. Wilson and Mason (2019) raised the existing siloed approach to regulation, where the mode-specific nature of present contracts can be a limiting constraint in terms of how vehicle assets are utilised—i.e., *buses can only be buses, taxis can only be taxis; a bus cannot behave like a taxi and vice versa*. In a number of markets, government-sponsored microtransit (or DRT) are being implemented but in many cases government picks a TNC partner and in doing so reduces competition. A recent development (first discussed in Thredbo 15) is the idea of incumbent mode-specific operators reinventing themselves to become a “total transport provider” (Lowe et al., 2019)—linked to MaaS and the idea of mode-agnostic mobility contracts as a form of modal equalisation (Wong et al., 2019). This constitutes a recognition that a lot of synergies can be gained by integrating business models,

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including the opportunity to internally cross-subsidise between modes and offering better integration between modes for the travelling public. The idea is consistent with government’s move from output/intermediate objectives (e.g., kilometres delivered on defined vehicle types) to outcome/final objectives (e.g., accessibility afforded to the citizen). The cross-modal synergies may be considered in a collaboration context too, including how feeder and trunk services might be integrated, as well as the opportunities/challenges with working across the domain of public (contracted) and private (commercial) modes. Bushell et al. (2019) offers the framework of micro and macro levels of transport to motivate this issue (Table 2).

Table 2: Characteristics of the micro and macro transport spectrum—Adapted from Bushell et al. (2019)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Micro system</th>
<th>Macro system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service area</td>
<td>Intra-urban</td>
<td>Inter-urban</td>
</tr>
<tr>
<td>Passenger volume</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Ownership</td>
<td>Largely public sector</td>
<td>Largely private sector</td>
</tr>
<tr>
<td>Usage</td>
<td>Commuter traffic, day travel</td>
<td>Overnight or longer</td>
</tr>
<tr>
<td>Ticketing</td>
<td>Turn up and go</td>
<td>Bookings/charters required</td>
</tr>
<tr>
<td>Pricing</td>
<td>Fixed</td>
<td>Flexible (using revenue management techniques)</td>
</tr>
<tr>
<td>Frequency</td>
<td>Many repeated services (low timetable focus)</td>
<td>Few repeated services</td>
</tr>
<tr>
<td>Capacity utilisation</td>
<td>Lower (on average although in peaks can be crush load)</td>
<td>Higher</td>
</tr>
<tr>
<td>Farebox subsidy level</td>
<td>Higher</td>
<td>Lower or none</td>
</tr>
<tr>
<td>Degree of commoditisation</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Examples</td>
<td>Bus, rail, ferry, metro</td>
<td>Airlines, long distance rail/coach</td>
</tr>
</tbody>
</table>

The MaaS proposition is predicated on bundling modes and fare products, which is supported by a diverse range of economic literature pointing to how bundling might stimulate demand to achieve cost economies (Guiltnian, 1987). However, there also exists sufficiently compelling reasons to unbundle or de-integrate (Cusumano et al., 2015). The airline industry is a case in point where low cost carriers have made the unbundling of services a part of their business model. Lately, even full service carriers have taken on this path in both economy and premium cabin products. Bushell et al. (2019) offered the perspective that it may be premature to examine bundling, especially in a developing country context. What is required may be a clearinghouse/facilitating mechanism, in the same vein as what the International Air Transport Association (IATA) does as a trade association for the aviation sector. However, one of the key questions asked is why larger operators might want to join such a collaborative model (Mateo-Babiano et al., 2019), as it might make it easier for existing customers to use smaller competitors (benefiting smaller operators) and hence lead to a loss in market share.

Collaboration was also considered in the context of land use and mobility. The Singapore Urban Redevelopment Authority (URA)’s research collaboration with Grab was pointed out as an excellent example of joint efforts (Chua et al., 2019), although the more cynical asked what Grab would hope to get as a return on investment out of the venture. In terms of commercial synergies, Hong Kong’s MTR railway+property model allowing the internalisation of positive externalities (i.e., value uplift from the development of new railway stations) was touted, it being linked with the trend towards the blurring of sector boundaries. However, institutional barriers can often hinder such innovative arrangements, as in the case of Singapore’s SMRT which is prevented from gathering non-fare revenue (including advertising). New modes
coming online like drones/urban aviation and how they might integrate with the rest of the network was also discussed but many workshop delegates were more lukewarm towards the merits of such idea.

3.5 What is the scalability of different business models?

Linked to the applicability of business models between modes/sectors is the scalability of different business models across local and global contexts. Large businesses as global citizens have a tax advantage as well as the ability to reap economies of scale. As an example, better access to capital in one market can lend itself to a competitive advantage across an entire organisation (the case of virtually all aircraft leasing companies being registered in Dublin, Ireland is an oft-cited example). On the other hand, smaller, more decentralised companies often have a bottom-up structure and a more community-minded focus. A hybrid model of companies wanting to be big but also small (linked to the idea of ‘glocalisation’) was also discussed, with local operations/community relations management but many shared services (e.g., human resources, information technology) being managed at the global level. A number of example multinationals were discussed to illustrate this. For example, the McDonalds model with a generally homogenous product offering was compared with HSBC (“the world’s local bank”). ComfortDelGro (SBST in Singapore) is any international player where management structures and brand identity can be very bespoke and tailored to different communities. Some companies have been dismantling a previously unified (coherent) brand (e.g., FirstGroup in the UK) due to a perceived lack of strength in the brand.

3.6 What are the implications of technology for business?

Technology was presented as a double-edged sword for business. The implementation of technology was a key focus in many technical papers, particularly relating to automation technologies, including implications on businesses competitiveness and efficiency. The promise of autonomous vehicles arising time and time again—relating to a future of “zero harm, zero skill, zero time [and] zero size” (Mehta et al., 2019). Electrification and how it might blur sector boundaries, including impacts on the distribution networks and democratisation of power was also discussed.

The idea that “technology favours tyranny” was raised as a counterpoint. Autonomous vehicles, for instance, would bring significant disruption to the labour force and force economic restructuring. The need to introduce human errors to robotic algorithms was raised since if autonomous vehicles did not mimic (imperfect) human driving behaviour then their interaction in mixed traffic will confuse human drivers and cause traffic accidents. Cyber security, including who owns data; the containing, access and management of data also emerged in discussions. Consumer ‘buy-in’ to such systems was at stake, as well as government’s role in innovation. Presently, there was a view held of government’s ‘obsession’ with innovation and adoption—often embodied in the myopic idea of “trials for trial’s sake”. Another cynical view that was held was that of technological determinism (the idea of the “hammer looking for a nail”), where every technology was seen as a panacea, with a lack of clarity for the purpose of technology and why it is needed in different contexts.

Questions were hence raised about how technology ought to be implemented against this backdrop. How do consumers and businesses adapt and transition from non-tech to full-tech? The idea was aired that the biggest disruptions are yet to come. Many of the present new mobility services, technologies and businesses cannot be regarded as ‘disruptive’ since they still try to earn revenue in traditional ways by transporting people. Real disruption would only occur when the core principles of travel taking time and travel being a derived demand are challenged. For instance, autonomous technologies might mean that the travel time budget
conception is altered, whilst collaboration with other sectors (e.g., property developers, retailers) might change the revenue model fundamentals of transportation companies.

3.7 What role do customer expectations play in business?

Every business is reliant on its customers, although in the transportation sector who the customer is can often be unclear. For a contracted operator, is the customer the government (who, at least in a gross cost case, remunerates the operator), or is the end user (passenger) with whom they serve? Whose needs ought to take priority? For a vehicle (or train consist) supplier, is the customer the transport operator, or (again) the end user? What if the operator selects their preferred vehicles but it is the government who ultimately pays the supplier as in the (unique) case of New South Wales, Australia? What are the implications of future business models (for instance, the idea of a mobility broker/aggregator) with incumbent businesses losing direct access to the customer, and in doing do becoming only an agent in the supply/value chain?

The advent of new technologies (e.g., real time information systems) has raised product quality which in turn has increased customers’ expectations of service. This is a perpetuating cycle which can be a challenge for many businesses but also an opportunity to exploit. Vu et al. (2019) considered the Swiss case with road-side carpooling (pick-up point) infrastructure as an example of such advances in technology and subsequently customer expectations. Another key challenge in the transportation sector relates to the price of a trip not being equal to its perceived value. As a corollary, the willingness-to-pay of the public for transportation is often far less than its cost of provision, with implications for the many user-pays systems being touted.

The merits of subsidised public transport (and free public transport at the extreme of the spectrum) was hence discussed, linked to this reality of the public’s willingness-to-pay. Again, context-specific differences emerged including the expectation in continental Europe of public transport being free, as compared to the UK and countries steeped in Anglo traditions where this is not the case. The cultural layer of how customers might not appreciate a free service was also discussed, leading to vandalism and graffiti (although one might argue that this already is a problem). Of course, there is no such thing as a ‘free lunch’ since somebody (e.g., employers or taxpayers) ultimately pays for public transport. The merits of the hypothecation of fare revenue (or other funding streams) for use in funding public transport, as opposed to using consolidated government revenue was also discussed. Whilst the workshop did not reach a consensus on the issue of free public transport, the potential to use pricing as a ‘nudging’ mechanism for optimising demand and supply was agreed upon as a clever strategy and opportunity.

3.8 What else drives business models?

Whilst the preceding sections and workshop discussions covered many facets of business models, including sustainability, equity, governance structures, context, labour, customers, technology, strategic visions, policy/regulations/legislations and innovation, there are more ‘wild card’ factors at play which might drive a business. Risk attitude (especially the attitude towards failure) is most important, and often crucial for attracting investors. Various charismatic entrepreneurs serve as advocates or ‘champions’ for their cause and are able to attract venture capital funding without being profitable but by virtue of being risk-loving. What is important, however, are the learnings that arise from failure. The role of entrepreneurial spirit therefore can be a major determinant and ran in the face of conventional wisdom in terms of a company’s valuation (for instance). How this culture runs through a company from its
leadership is a major internal facilitator as well as possible barrier to a company’s success in the marketplace.

3.9 What’s the next big thing in the world of business?

Whilst the workshop was not able to pinpoint a particular ‘big thing’, a number of recurring themes re-emerged in the context of considering this question. The important link between transport and health outcomes was raised. This is linked to the issue of the need to travel in the future, with the rise of telecommuting, co-working spaces, and trend towards ‘transient communities’. The servitisation of the entire mobility value chain (including the roles of information technology and original equipment manufacturers) also emerged, with implications for the ownership of cars and housing, as well as the provision of parking. The rising degree of affluence across the world is also a megatrend, with the rise of a consumer-centric culture (as opposed to the focus on social inclusion), and key unknowns around how millennials might shape the world. The need to subsidise public transport (and, by extension, the transport sector more generally) was raised. Climate change and more extreme weather events also comes to the fore, with a particular need to ensure that businesses are sustainable and infrastructure assets resilient. A final concern was raised about the implications of big technology players (like Google, as the ‘dark force’) and their implications for privacy, competition, and the future of existing business models.

4 Proposed research and policy agenda

A number research and policy agenda themes were co-created from the technical paper presentations and workshop discussions. The first relates to the role of government/governance. Clarity and purpose in government’s strategic objectives is necessary and often hindered by the lack of coherence and definitional inconsistencies on many emerging developments. Government’s ability to regulate, often hindered by the political process, was also brought up— with the view that the “authority is given more authority in Singapore”. Policymakers have to ‘step in’ to control for unintended consequences (including externalities like congestion, social exclusion and urban sprawl), but also allow adequate space for market players to innovate. They also need to bring all stakeholders to the table and consider those players who are not often represented. Those governing must enable and embrace innovation and collaboration, not only between private sector players, but also between the private and public sectors.

This brings to focus the second theme around trust and collaboration. Trusting partnerships as a Thredbo cornerstone theme was again brought up (Hensher and Houghton, 2005; Merkert and Hensher, 2013). Whilst collaboration is important, trust goes beyond legal/commercial specifications in a supply/value chain and enters the domain of unwritten or unquantifiable factors which decide success. The case of MaaS, as an example, should not be implemented unilaterally on proprietary standards but rather rely on the goodwill, trust and shared values of an open ecosystem with many competing providers in the market.

Climate change and uncertainty was identified as another important theme going forward. Not only are electric technologies important but how businesses adapt to it (as well as the role of other technologies like automation) are important aspects of the conversation. The United Nations (UN) Sustainable Development Goals (plus the roles of other supranational organisations) and the continuing discourse on global commitments will only grow more prominent in future years.

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3 An example is ridesharing providers like UberX, where the ‘sharing’ refers to the temporal utilisation of the vehicle asset, as opposed to the far more important need to share space.
The final theme relates to the application of policies and learnings. Learning from both comparable and diversified contexts and the documentation of them are important (and one of the strengths of the Thredbo conference series). In particular, there is a need to develop hybridised frameworks and to apply learnings not only from developed to developing countries, but also in reverse from developing to developed contexts. As an example, the informal transport sector in many developing economies and their formalisation/integration with mass transit has close parallels with the challenges faced by the TNC sector in developed economies (Mateo-Babiano et al., 2019). Finally, it is important that policymakers do not take on a one size fits all approach, but rather a “horses for courses” view, to account for the particular institutional and cultural contexts of a different applications and facilitate innovation wherever possible.

A number of research gaps/priorities to guide future academic work were identified, and include: (i) understanding the barriers to collaboration, both internal and external to a firm; (ii) how best to transition from no-tech to full-tech; and (iii) the economic restructuring and unintended consequences of technology.

Finally, it is recommended that as a workshop theme for the Thredbo 17 conference to expand the remit of “emerging business models” to consider “emerging transport ecosystems” and their broader implications for society over time. We expect that both new business models and transport offerings will emerge with existing once becoming increasingly muddled as customer centred services and enhanced technology will further integrate micro and macro transport systems to create superior door to door travel experiences. In fact, we argue that transport will become even more embedded with other services that business models will go far beyond the traditional sector as increasingly noticeable in the Maas discussions. We further anticipate that the global value chain and climate change debate will intensify and hence argue that a Thredbo 17 workshop on sustainability would not just be very popular but by then a crucial component of the conference but a theme that will become increasingly paramount as things heat up (pun intended) and water levels rise.

5 Conclusions

To conclude the workshop learnings requires revisiting a number of fundamental questions. A recurring key idea is whether the prospects witnessed today will truly make a difference to present business models. What is not desirable is for the many positive aspects of today to suffer as a result of the belief that all technologies are beneficial. What is needed is clarity around the value add of the many emerging propositions. The workshop hence held a healthy scepticism, in contrast to the hype and rhetoric fuelled by the Silicon Valley types. Indeed, the workshop even challenged the usual Thredbo themes which was widely held in other workshops (including in the opening keynote of the conference) like the preference for gross-cost contracts and government-held assets. Innovation was seen as enabler of future business models, albeit with blurring boundaries along the value chain. As such it will be difficult to develop policy solutions across the board as no size fits all or “Horses for courses” was seen as an important notion, similar to previous Thredbo conferences. The workshop also raised a number of cross-cutting themes. The idea of value was established at the outset as a fundamental definition of a business model; indeed, without a value proposition, one is without a business model. Trust and collaboration, and the blurring of sector boundaries were also raised frequently, including the idea that many determinants of success extend beyond business models and into the realm of the entire transport ecosystem. The hype and rhetoric associated with many technologies meant that a ‘level head’ is necessary, avoiding the technological deterministic mindset so as to ensure that technologies are not implemented for technologies’ sake, but rather leveraged to ensure societal advantage. The learnings from this
workshop support the continued attendance and engagement with Thredbo. There is scope to enlarge the representation of the Thredbo community, as well as encouraging more learning and sharing between the biannual conferences.

Acknowledgements

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**Appendix: Workshop Participants**

<table>
<thead>
<tr>
<th>Name</th>
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