

**Technology disruptors in
tourism**

Austrade

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Acronyms

Acronym	Full name
AR	Augmented reality
ATM	Automated Teller Machine
AUD	Australian Dollar
AV	Autonomous Vehicle
CBD	Central business district
CEO	Chief Executive Officer
CIO	Chief Information Officer
EFTPOS	Electronic Funds Transfer Point of Sale
FTE	Full time equivalent
GPS	Global Positioning System
GSP	Gross State Product
NFC	Near Field Communications
NPP	New Payments Platform
NVS	National Visitor Survey
NZ	New Zealand
POS	Point of sale
PR	Public relations
QR code	Quick Response code
RFID	Radio-frequency identification
USD	US Dollar
VR	Virtual reality
VTOL	Vertical take off and landing

Executive summary

The introduction of new technologies has disrupted and continues to disrupt the tourism industry in many ways. It has changed the way operators target travellers, it has challenged existing service offerings and is forcing a re-imagining of the visitor experience and the end-to-end visitor journey.

While some level of digital disruption has been experienced by all facets of the tourism industry, indications are that its effects vary across the sector's sub-components. This finding is based on desktop research, bespoke surveys of domestic and international travellers and consultation with tourism and technology subject matter experts.

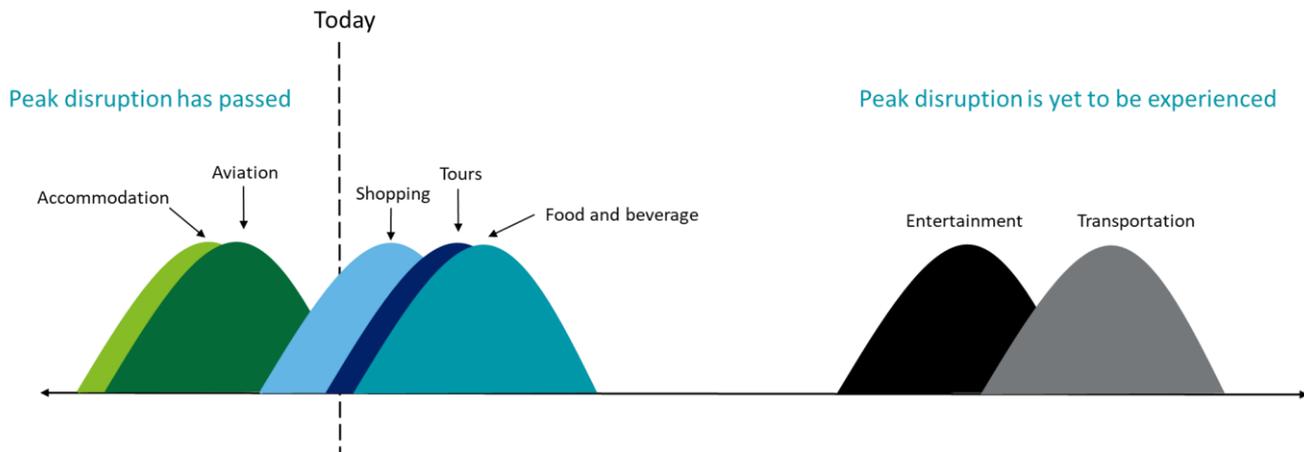
On average, experts believe that the peak impact of technology on the accommodation and aviation sectors has passed. The accommodation industry has already faced significant disruption from sharing economy platforms, but there are limited opportunities to expand the sharing economy's accommodation scope. The aviation sector has been disrupted by online aggregators and social media, with further disruption expected to be limited.

The next wave of digital disruption is expected to further impact the shopping, tours and food and beverage sectors. Online shopping and emerging payments platforms are changing how people shop while travelling, tours may face competition from virtual and augmented reality experiences and can be affected by social media trends. The food and beverage sector is also experiencing disruption from social media trends, as a number of food delivery platforms change the way locals and visitors choose to eat.

On the other hand, while they have seen considerable disruption already, the peak impact of technology in disrupting the entertainment and transportation sectors is expected to be felt in the medium or longer term.

Beyond the disruption experienced in the entertainment sector through the introduction of multiple new channels and providers, the future key disruptors of the entertainment industry will be augmented and virtual reality, drones and wearables. With some aspects of the transportation sector having already been disrupted by new offering facilitated by sharing economy platforms, the next wave of disruption for the sector, including autonomous vehicles and urban air transportation, will emerge in coming years. Getting the regulatory environment right to enable these technologies is likely to make them a longer term disruptor.

Figure i: Tourism digital disruption map: When will peak disruption occur?



Source: Deloitte Access Economics, based on consultation with technology and tourism experts.
 Note: diagram is illustrative only, representing when the 'peak impact' is expected to occur, preceded by a period of increasing impact of digital disruption on the tourism sector, and followed by declining disruption impacts. Technological disruption on each sector does not disappear completely at either end of the 'wave'.

This research is intended to explore the impact of technology disruptors on the tourism industry, considering current and future use, perspectives, opportunities and barriers. The five technology disruptors considered in this study are:

- social media
- augmented/virtual reality
- sharing economy
- emerging payments platforms
- visitor tracking.

These selected technology disruptors have different impacts across the tourism industry. The first four technologies primarily influence consumer travel decisions and experiences, while the fifth has more of an influence on tourism operators, in that the data obtained through visitor tracking can inform decision making around service offerings.

This research considers the impact and implications that each of these technologies will have on the tourism industry. It is informed by Deloitte Access Economics' desktop research on the role that these technology disruptors currently play and are likely to play in the next 5 to 10 years, and primary research including:

- a survey of 1,003 domestic visitors, fielded in June 2018
- a survey of 2,520 international visitors, fielded in September 2018
- consultation of 15 technology and tourism experts via a web portal, conducted in September 2018.

Research findings

Social media

Globally, more than 3 billion people – almost half of the world's population – are active users of social media. The spread of social media continues to grow, with an additional 362 million active users since 2017 (Kemp, 2018), equivalent to growth of around 1 million users a day.

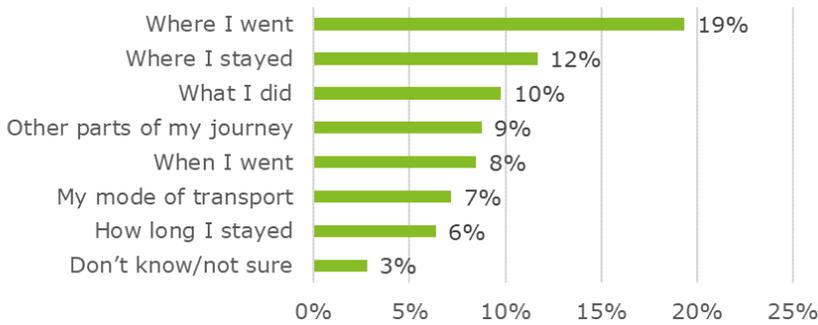
Social media in various forms has been around for many years. In the next 5 to 10 years, social media will continue to evolve. The quality and

interactivity of social media content will be important to capture travellers' attention. The tourism industry will also need to be mindful of the impact of social media on consumer expectations – of experiencing what they have seen online, balanced with delivering meaningful experiences.

Deloitte Access Economics' primary research finds that 75% of domestic travellers report using social media while travelling; ranging from 48% of those aged 65-74 to 100% of those aged 18-25.

The primary research also found that social media influenced the decision making of 36% of domestic tourists (see Figure ii). Social media was most likely to influence where travellers chose to go (19%) or where they stayed (12%), but had less influence on mode of transport (7%) or duration of the travel (6%).

Figure ii: Influence of social media on domestic tourism decisions

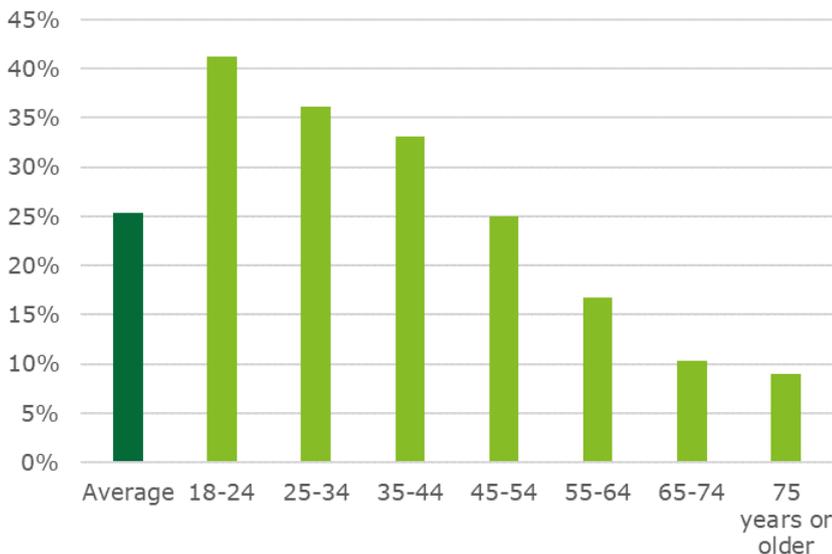


Source: Deloitte Access Economics, Research Now 2018

Note: For 64% of respondents, social media did not influence their decision making about tourism in Australia. Responses do not sum to 100% as respondents could choose multiple options.

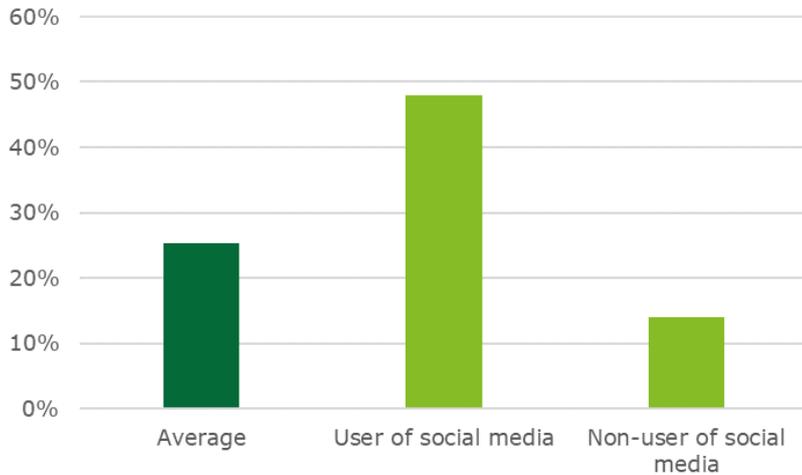
Younger people and those currently using social media expect their use of social media for travel decisions increasing in the future; 41% of 18-24 year olds and 36% of 25-34 year olds expect an increase in use (see Figure iii), and 48% of current users expect higher use in future (see Figure iv).

Figure iii: Percentage of domestic travellers who expect to use more social media (compared to now) for travel decisions in the future, by age groups



Source: Deloitte Access Economics, Research Now 2018

Figure iv: Percentage of domestic travellers who expect to use more social media (compared to now) for travel decisions in the future, by users and non-users



Source: Deloitte Access Economics, Research Now 2018

Note: here a 'user of social media' refers those respondents whose travel decisions were influenced by social media.

Research findings and implications for industry

- Travellers use a range of social media platforms for different purposes, and tend to use and share content on more than one platform. Social media is expected to continue to evolve to meet consumer demand, including more visual content (including more videos as opposed to text-based articles or photos), more mobile-native platforms, incorporation of augmented reality/virtual reality (AR/VR) content and the opportunity for users to opt for 'premium' or advertisement-free content. Social media is a significant investment for tourism suppliers – and it needs to be properly managed for the benefits to be maximised.
- Domestic travellers are not generally using social media as a channel for seeking recommendations or trip planning yet (only 36% are doing so), with the greatest current benefit stated as facilitating contact with tourism operators. Fast communication should be a focus for tourism operators.
- Internet connectivity and data costs remain a barrier to social media use (identified as a top 3 barrier by 39% and 33% of international and domestic respondents, respectively, in Deloitte Access Economics' primary research) and while travellers are not expecting connectivity at all tourism destinations, demand for WiFi connectivity in hotels, and on airlines, is increasingly important to international and domestic travellers.

Augmented/virtual reality

Virtual reality (VR) and augmented reality (AR) are points on a spectrum between the real, physical environment and a computer-generated simulated environment.

VR and AR have the potential to inspire additional travel and enhance, or increase accessibility of, existing experiences. To a lesser extent, these technologies may become a substitute for experiences and replace some travel. Examples of VR and AR applications in tourism include First Airlines, a Japanese tour firm which offers virtual two-hour trips from Tokyo to Paris, and Magic Leap's augmented reality applications, which superimposes images on existing surroundings. These applications have the potential to

compete with existing visitor experiences, but can also increase the accessibility of experiences for those who would not otherwise had the experience in person.

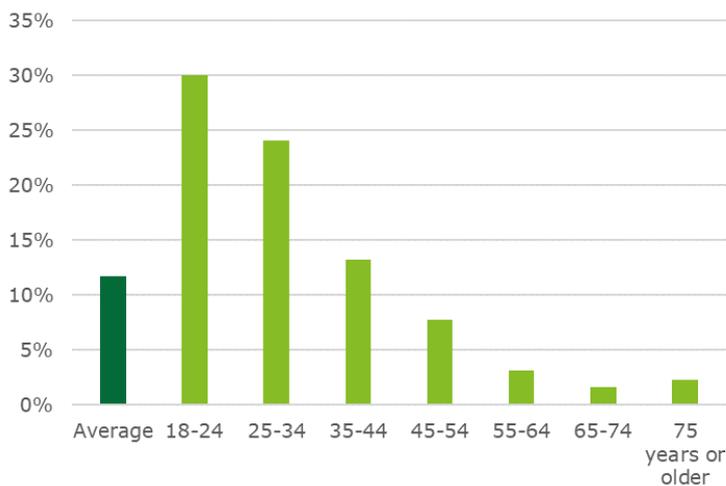
Figure v: Magic Leap augmented reality



Source: Strange (2016)

VR and AR technologies are still relatively new. Deloitte Access Economics' primary research found that while more than two-thirds of domestic travellers are aware of the technologies, only 12% have actually used them while travelling. As shown in Figure vi, younger cohorts were more likely than average to have used VR and AR while travelling (30% of 18-24 year olds and 24% of 25-34 year olds), compared to older cohorts (less than 3% of respondents aged over 55 years).

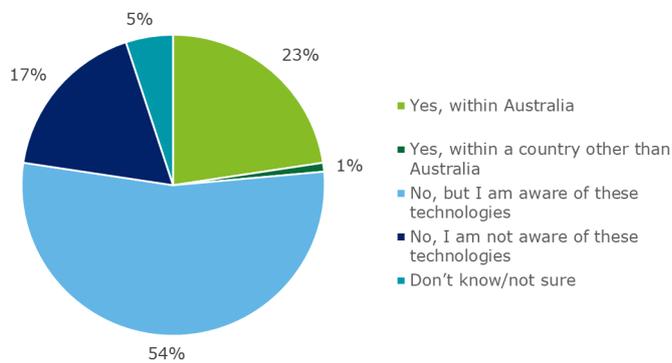
Figure vi: Percentage of domestic respondents who use AR/VR while travelling, by age groups



Source: Deloitte Access Economics, Research Now 2018

Interestingly, international travellers were almost twice as likely to have used AR/VR while travelling in Australia as domestic travellers (23% compared with 12%), and had slightly higher awareness of the technology overall (see Figure vii).

Figure vii: Current use of AR/VR while travelling among international tourists



Source: Deloitte Access Economics, Research Now 2018

People who have previously used the technologies are more likely to expect increased use in future - of the respondents who expected to use more VR in the future, 25% were current users of AR/VR.

Research findings and implications for industry

- Travellers are starting to seek VR and AR as part of their travel and booking experience, and this can be leveraged by tourism operators to attract visitors, including through new offerings and increased accessibility.
- The majority (66%) of survey respondents in Deloitte Access Economics' primary research did not envisage AR/VR will make them less likely to visit places in real life.
- AR/VR is expected to make 44% of domestic travellers more likely to visit an attraction, potentially inspiring additional travel, or additional expenditure while travelling.
- The primary research finds that international tourists are almost twice as likely to expect to be using more AR/VR in their travels in the next 5 years, compared with domestic tourists. Chinese tourists in particular are the most likely to expect to be using these technologies in future, with three out of five expecting to use them more in the next 5 years. This presents opportunities around targeting these offerings to meet consumer preferences.
- Tourism suppliers need to navigate the challenges and risks of finding the right commercial model and maintaining the quality of experiences.

Sharing economy

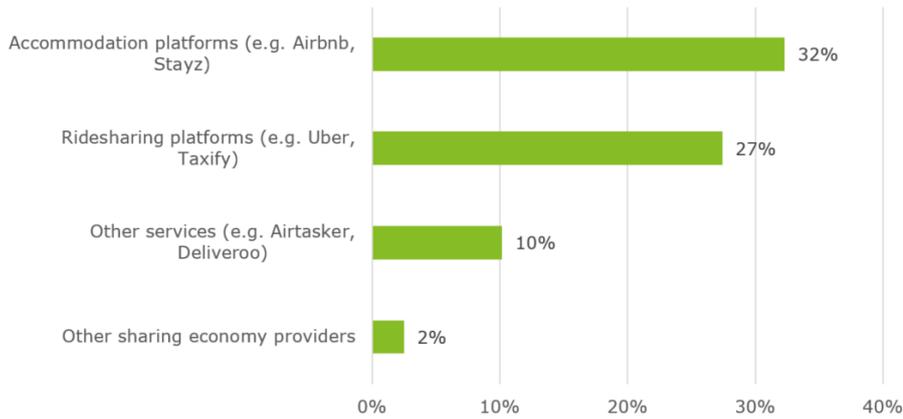
Sharing economy platforms have had considerable success in connecting visitors to accommodation, transport and food services providers, disrupting the tourism and transport sectors (such as travel agents) which traditionally have played this role.

Developments in information communication technology have lowered the cost of transacting directly between buyers and sellers, supporting the rise of peer-to-peer platform applications such as those involved in the sharing economy.

Deloitte Access Economics' primary research finds that half (49%) of domestic travellers have used at least one type of sharing economy service while travelling. Of those who have used a sharing economy service while travelling, Figure viii shows that nearly a third of domestic travellers have

used accommodation platforms (32%) or ridesharing platforms (27%) during their domestic trip.

Figure viii: Current use of sharing economy platforms while travelling among domestic travellers

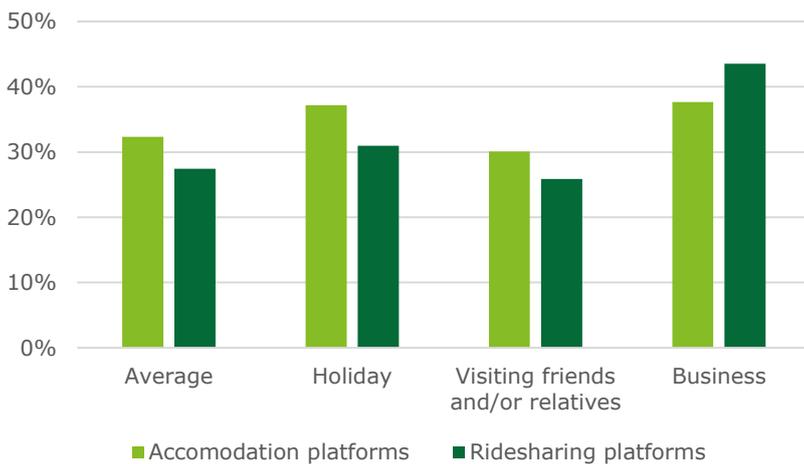


Source: Deloitte Access Economics, Research Now 2018

Note: 51% of respondents have not used any sharing economy services while travelling within Australia. Responses do not sum to 100% as respondents could choose multiple options among the types of sharing economy platforms.

When considering this by purpose of travel, 37% of holiday travellers have used accommodation platforms and 44% of business travellers have used ridesharing platforms (Figure ix).

Figure ix: Current use of sharing economy platforms while travelling among domestic travellers, by travel purpose



Source: Deloitte Access Economics, Research Now 2018

Individuals whose domestic travel was to a metropolitan area outside of their state of residence were more likely to use ridesharing platforms; with 38% of these individuals having done so compared to the average of 27%.

For those that have used sharing economy services, the top three benefits reported are saving money (identified in the top 3 by 53% of respondents), the large range of offerings (40%) and ease of use (40%).

Research findings and implications for industry

- Sharing economy platforms have achieved significant penetration in the visitor market, but are expected to approach saturation in existing markets in coming years. Despite strong growth, half of domestic travellers have not used sharing economy services while travelling pointing to the continuing role for traditional providers.
- There are opportunities for the scope of sharing economy services to expand in future, through increased integration with general travel and tourism services. Industry will benefit from being aware of and participating in upcoming trends to keep up with the competition, in order to maximise opportunities for businesses as well as consumers.

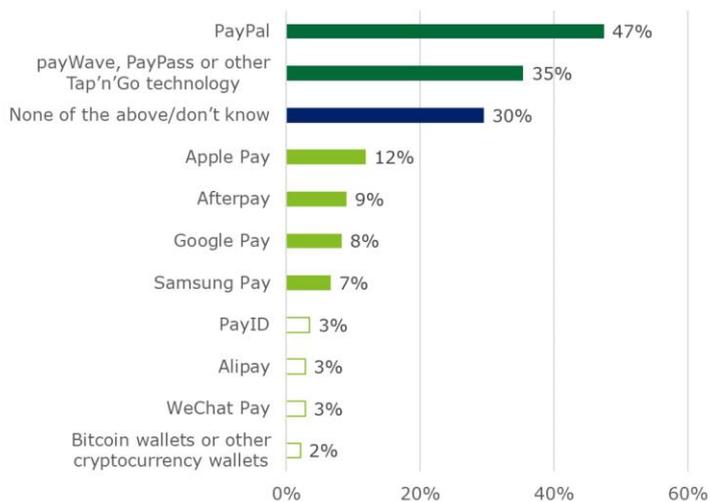
Emerging payments platforms

Emerging payment systems, such as payment via apps, PayPal and Tap'n'Go technology, are moving payment to the background, rather than interfering with customer experiences. The more straightforward the process for the consumer, the better. These systems have clear benefits for consumers, including domestic and international tourists, by reducing friction at the point of sale and leaving the individual free to enjoy the experience.

Technology has enabled a range of new payment options. Of relevance to the tourism industry, key developments include digital wallets, Near Field Communications (NFC) and mobile point of sale.

The primary research found that more than one third of domestic travellers used Tap'n'Go technology while travelling, and almost half use PayPal, though other emerging payment platforms are not as well known or used (see Figure x).

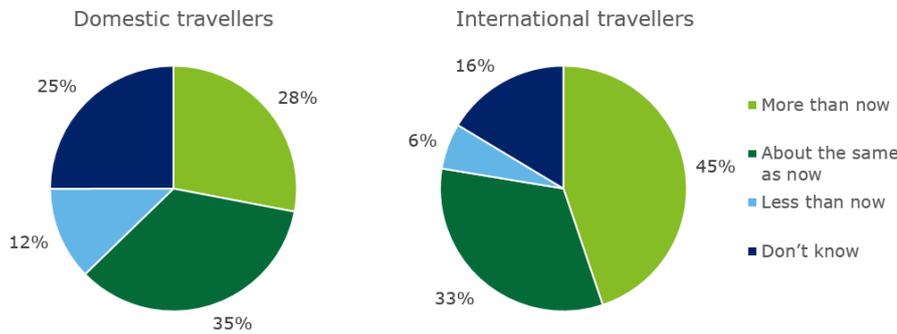
Figure x: Current use of emerging payment platforms while travelling among domestic tourists



Source: Deloitte Access Economics, Research Now 2018

Travellers anticipate that their use of emerging payment systems in future will be at or above current levels. A quarter of the domestic travellers in the survey expected the use of emerging payment services to increase in the future. This increases to 45% among international travellers.

Figure xi: Future use of payment services (e.g Apple pay, Wechat pay)

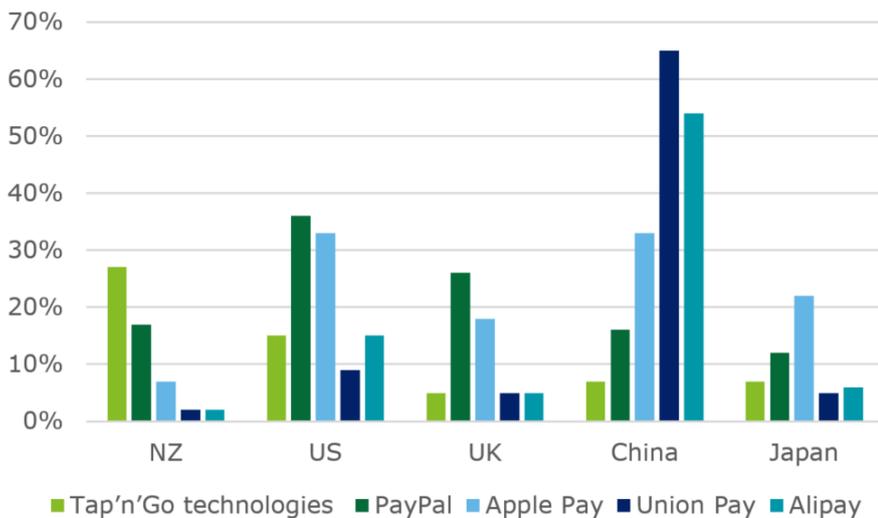


Source: Deloitte Access Economics, Research Now 2018

Research findings and implications for industry

- Quick and easy automated payment systems can improve the visitor experience. Consumers seek familiarity, an intuitive user experience and trust in their payment systems. When travelling, particularly overseas, consumers want, and expect, global interoperability – and ease of payment can increase the likelihood of transactions.
- Domestic travellers are increasingly using emerging payment systems, with younger and higher income households more likely to adopt new technology. International travellers’ payment system preferences differ to those of Australian travellers, and therefore tourism operators seeking to target these markets may wish to consider greater uptake of Apple Pay, PayPal, Union Pay and Alipay systems, noting preferences vary by source market (see Figure xii).

Figure xii: Current use of emerging payment platforms of international travellers while travelling in Australia, by country of origin



Source: Deloitte Access Economics, Research Now 2018

Key challenges and opportunities for tourism suppliers include costs and other barriers relative to the benefits of allowing consumers more ways to pay. Identifying the most profitable payment infrastructure to offer tourists

(particularly international tourists) will be a key challenge for Australian travel suppliers in the coming years.

Visitor tracking

Early versions of tourist tracking started in 1970s and 1980s where participants recorded observations in diaries and were interviewed during their travels. Other methods of visitor tracking have not directly involved participants, with data collected by third parties tracking visitors.

With advancements in technology, tools such as GPS, cameras, smartphones and sensors will be increasingly incorporated in visitor tracking. Subjects’ movements can be monitored by an application on a mobile phone or an external physical device carried while travelling. An example is the Sense-T system previously used in Tasmania, based on real-time sensor data collected via smartphones.

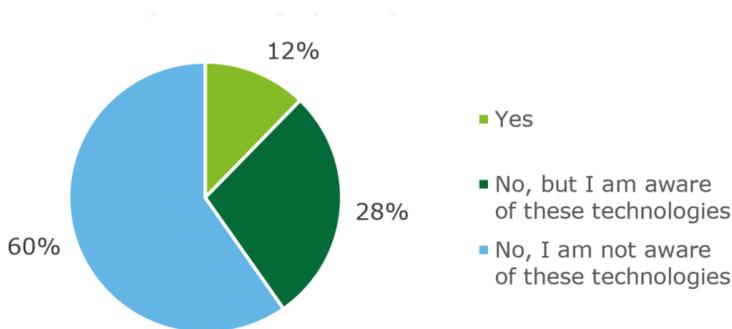
Figure xiii: Different applications Sense-T



Source: Ionata (2017)

That said, more than half of domestic travellers are not aware of visitor tracking technologies. Deloitte Access Economics’ survey found that only one in ten (12%) domestic travellers reported using visitor tracking technology in their travels (see Figure xiv).

Figure xiv: Current use of visitor tracking while travelling among domestic travellers

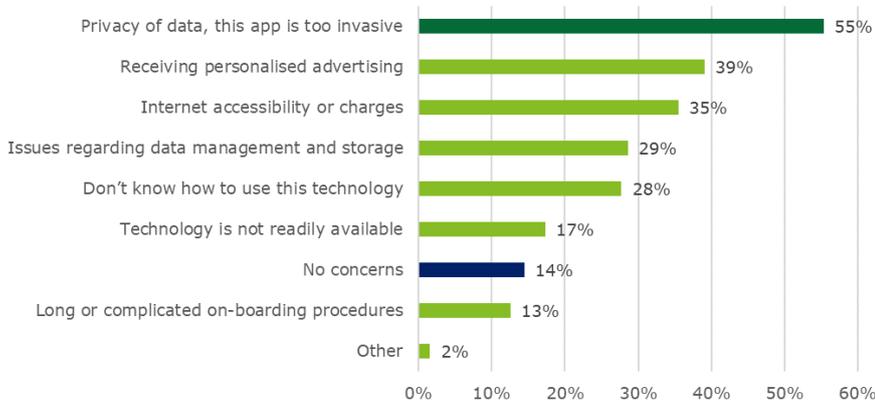


Source: Deloitte Access Economics, Research Now 2018

Younger people, social media users and AR/VR users were more likely to have used visitor tracking; 23% of those aged 25-34, 28% of social media users and 56% of AR/VR users reported using the technology.

While the technology is available, a number of barriers have limited the use and take-up of visitor tracking in the tourism sector to date. The primary research found that privacy was a major concern related to the use of visitor tracking applications with 55% of respondents citing the invasiveness of the application as a major barrier to their use of visitor tracking. Other barriers included receiving personalised advertising (39%) and internet quality or charges (35%). These considerations were consistent across different cohorts of travellers (gender, age, purpose of travel, location of travel).

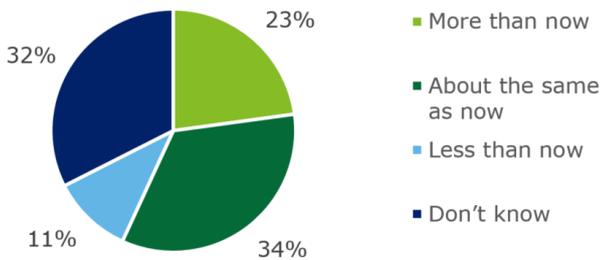
Figure xv: Barriers to the use of visitor tracking among domestic tourists



Source: Deloitte Access Economics, Research Now 2018

Domestic travellers are uncertain whether use of visitor tracking will increase in coming years. Figure xvi shows that one-third of domestic travellers (32%) are unsure of how much they will be using visitor tracking technology in the future. This is likely to reflect the early stage of use of the technology, a lower understanding of the technology, a lack of previous experience using it, as well as high perceived barriers to take-up. That said, one-quarter of travellers expect their use will increase.

Figure xvi: Use of visitor tracking in the future among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Research findings and implications for industry

- Privacy considerations are a significant barrier to uptake. This highlights the importance for developers and tourism suppliers to ensure that users' privacy concerns are adequately addressed.
- Visitor tracking presents an opportunity to industry. There are productivity benefits for businesses utilising visitor tracking – arising through collecting additional data that could support decision making by government, researchers and other businesses, and lead to improvements in the visitor experience.
- To expand use of visitor tracking, the benefits for users must be clear. When travellers are provided with an appropriate incentive (financial or otherwise), this can help overcome some the barriers to use and adoption.
- Travellers also recognise that their participation in and use of visitor tracking applications can contribute to the greater good – with a third of domestic respondents noting contributing to the travel community and research as one of the top three benefits around the use of visitor tracking.

Conclusion

Digital disruption has already had a significant impact on the tourism industry. The peak impact of disruption is likely to have passed for the accommodation and aviation sectors, but is yet to be experienced for entertainment and transportation sectors. There is significant potential for technologies to further disrupt the tourism industry. Alongside the challenges that this brings, there are numerous opportunities to better meet the changing preferences of domestic and international tourists, which will support growth and diversification in the industry.

Across the five technology disruptors, the primary research has regularly identified that current use and future expected use of the technologies is greatest in the younger cohorts. As such, demographic change over time is likely to play a key role in increasing uptake of emerging technologies, seeing them become more mainstream. In coming years, technology disruptors will provide the platform for a re-imagining of the visitor experience and the end-to-end visitor journey.

Deloitte Access Economics

Key messages from the primary research

- Digital disruption will affect sub-sectors of the tourism industry in various ways and at different times. The peak digital disruption of accommodation and aviation sectors (via the sharing economy and online aggregators) has passed. The next wave of digital disruption is expected to impact the shopping, tours and food and beverage sectors, through emerging payments platforms, augmented and virtual reality and growth in the sharing economy.
- Peak digital disruption of the entertainment and transportation sectors is expected in the medium or longer term via next wave technologies. For the entertainment sector, key disruptors will be augmented and virtual reality, drones and wearables. While the transportation sector has already been disrupted by the sharing economy, the next wave of disruption, including autonomous vehicles and urban air transportation, will emerge in coming years. Getting the regulation right to enable these technologies is likely to make them a longer term disruptor.
- **Social media** influenced the decision making of 36% of domestic tourists. Social media was most likely to influence where travellers chose to go (19%) or where they stayed (12%), but had less influence on mode of transport (7%) or duration of the travel (6%). Social media is expected to continue to evolve to include more visual content, mobile-native platforms, and options for advertisement-free content.
- **Virtual and augmented reality** technologies are still relatively new. The research found that while more than two-thirds of domestic travellers are aware of the technologies, only 12% have actually used them while travelling. Use is expected to increase when barriers are addressed: cost of the technology, lack of know-how, and privacy issues.
- More than one third of domestic travellers used Tap'n'Go technology while travelling, and almost half use PayPal, though other **emerging payment platforms** are not as well known or used. International travellers are more likely to use Apple Pay, PayPal, Union Pay and Alipay while travelling in Australia. This likely reflects the prominence of these emerging payment systems in visitors' home countries, and the desire to use a familiar method of payment while travelling, or a reluctance to use foreign currency (either in the form of cash or travel cards).
- One-third of domestic travellers (32%) are unsure of how much they will be using **visitor tracking technology** in the future. Future use will be driven by expansion of benefits. The key identified benefits are the ability to record a journey on a personal digital map (42% of respondents), receiving personalised recommendations (41%) and getting real time updates (such as wait times) of sites or travel suppliers (40%).
- Half (49%) of domestic travellers have used **sharing economy** services while travelling, with the major uses being accommodation platforms (32%) or ridesharing platforms (27%). Younger people and those who travelled to a metropolitan area outside their state of residence are the most likely to have used sharing economy services.

1 Introduction

New technologies have disrupted, and continue to disrupt, the tourism industry. These technologies have the potential to enhance and challenge sectors of the tourism industry, by changing the way operators target travellers, disrupting existing service offerings and forcing a re-imagining of the visitor experience and the end-to-end visitor journey.

This research is intended to explore the impact of technology disruptors on the tourism industry, considering current and future use, perspectives, opportunities and barriers. Five technology disruptors and their impacts on the tourism sector are considered in this report. These include:

- social media;
- augmented/virtual reality;
- visitor tracking;
- sharing economy; and
- emerging payments platforms

These technologies were identified by Austrade and the Destination Research Program Project Committee for consideration in this study, with particular relevance to tourism. While digital disruption has impacted the sector over a number of years, the focus is not on those where impacts and implications are well-understood (for example, WiFi) or on technologies which are not available to the public and for which practical impacts are still to be discovered (for example, autonomous vehicles). The technologies considered in this report are currently available to tourists, with implications emerging as take-up increases.

This research considers the impact that these technologies will have on the tourism industry, through a map of the timeline of disruption and a traveller technology journey. The report also presents Deloitte Access Economics' research on the role that these technology disruptors currently play and are likely to play in the next 5 to 10 years. The primary research conducted for this project included:

- a survey of 1,003 domestic tourists, fielded in June 2018
- a survey of 2,520 international tourists, fielded in September 2018.

The bespoke surveys sought information on travellers' use of technology disruptors in planning travel or while travelling, their expected future use of these technologies, perceived benefits, barriers and other perspectives.

In addition to the survey, the study also included consultation of 15 technology and tourism experts via a web portal, conducted in September 2018. The web portal asked experts within Deloitte and from industry for their perspectives on nature of technology disruption on the tourism sector, as well as the timing of these impacts.

2 Digital disruption on the tourism industry

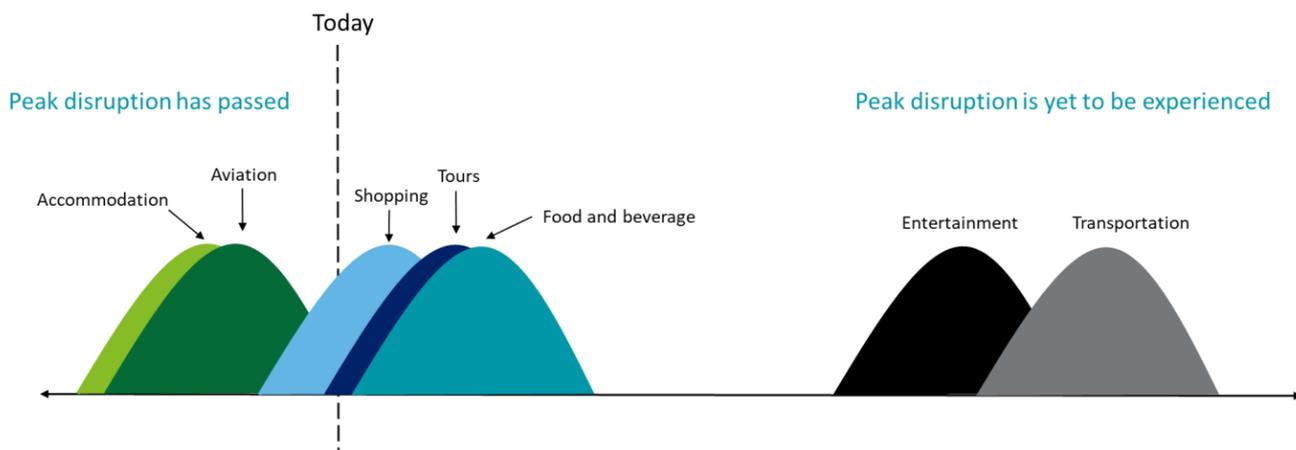
The view is that the peak of digital disruption has already passed for the accommodation and aviation sectors, though service offerings will continue to evolve.

The next wave of digital disruption is expected to impact the shopping, tours and food and beverage sectors, through emerging payments platforms, augmented and virtual reality and growth in the sharing economy.

Digital disruption will affect sub-sectors of the tourism industry in various ways and at different times. To understand the variance in timing of the impacts, a number of technology and tourism specialists from Deloitte and industry were asked when they expected digital disruption would have a peak impact on seven specific tourism sectors, including accommodation, aviation, entertainment, food and beverages, shopping, tours and transportation.

The results are mapped in the digital disruption timeline below. On average, the experts believed that disruption has already affected the accommodation and aviation sectors and the peak impact has passed. The next wave of digital disruption is expected to impact the shopping, tours and food and beverage sectors, through emerging payments platforms, augmented and virtual reality and growth in the sharing economy. On the other hand, the peak impact of technology in disrupting the entertainment and transportation sectors is expected to be felt in the medium or longer term as next wave technologies begin to emerge.

Figure 2.1: Tourism digital disruption map: When will peak disruption occur?



Source: Deloitte Access Economics, based on consultation with technology and tourism experts

Note: diagram is illustrative only, representing when the 'peak impact' is expected to occur, preceded by a period of increasing impact of digital disruption on the tourism sector, and followed by declining disruption impacts. Technological disruption on each sector does not disappear completely at either end of the 'wave'.

Given the nature of disruptive technologies and the challenges of predicting how they will affect existing businesses, it is difficult to estimate the size or net effect of the disruptive impact on each of these sectors. In the map, we have presented the crests of each wave as equal in magnitude. For some sectors, the disruption will be 'positive' in that it will open up new opportunities for the provision of goods or services, potentially increasing the market they can reach or streamlining the way they operate. In other industries, traditional operators will be negatively affected by digital disruption, with market share lost to new competition.

For the purposes of this map, the disruptors are not limited to the five technology disruptors considered in this report, but include broader consideration of the technology landscape that influences tourism sectors.

The following table provides high-level considerations of the impact of digital technology on each of the tourism sectors.

Table 2.2: Digital disruption on tourism sectors

Tourism sector **Impact of digital technology**

Accommodation Experts' opinions were that the peak impact on the accommodation sector has passed. The industry has faced significant disruption from sharing economy platforms offering alternative, and sometimes lower-priced, options relative to the more traditional offerings of hotels and motels. Over time, these sharing economy options have been increasingly considered mainstream.

However, the physical requirements of accommodation as a service offering mean that little further disruption is foreseen as there are limited opportunities to expand its scope to other facilities. Any additional competition from more rooms on the market is likely to have a smaller incremental impact than the wave of disruption already experienced.

The guest experience in the accommodation sector has also been shaped by digital innovation. Travellers can check-in online prior to arrival, be connected with other guests, and use tablets to order room service, to name but a few innovations.

Aviation The impact of digital technology in the aviation sector can be seen across the purchase process and the physical flight service. The customer experience around the purchase of flights has experienced disruption through the rise of online aggregators and social media. The ability for consumers to readily compare options across airlines, dates of travel and destinations for themselves, as well as reading service reviews, have shifted the role of travel agents and had a downward impact on prices. The increasing availability of WiFi on planes is now changing the in-flight experience.

Technology has improved efficiencies across the aviation sector, changing the consumer experience prior to the trip through personalised targeted marketing, on route and at the airport through airline check-in processes and advances in passenger screening. While there are further efficiency and passenger experience improvements anticipated as a result of emerging digital technology, experts expect that the peak impact of digital disruption on this sector has passed. This is in contrast to the local transportation sector which is expected to experience further disruption.

Shopping Shopping in the tourism context is currently experiencing what is expected to be its peak wave of disruption. The online shopping experience and its capabilities mean that people are less likely to need to travel to purchase specific items, instead having them available for worldwide delivery. Social media impacts the shopping industry through influencing the goods purchased as well as having their own platforms for the purchase or trade of goods.

During travel, developments in emerging payment platforms such as digital wallets, cryptocurrencies and Afterpay (which individuals can use to purchase goods or services, ranging from clothes to flights) are making it easier for

customers to purchase both overseas and while travelling using a payment method that suits their needs and reduces friction around the buying experience. Technologies are also enabling retailers to target potential customers while in-destination.

Tours There is a relatively high level of mobility for the customers of the tours sector, instead of being limited to tours, technologies have made it easier to customise individual travel itineraries.

Further, augmented reality and virtual reality are likely to have impacts on this industry; as will be discussed in Chapter 5, these technologies have the potential to present new opportunities for travel, improve existing tours as well as potentially reducing travel by some cohorts who perceive these technologies as alternatives to travel.

Social media and sharing economy platforms are also having an impact on the tour sector. Travellers can be influenced by user-generated content from social media. The sharing economy is emerging as a competitor in the touring space, offering experiences alongside accommodation offerings.

Food and beverage Experts believe the peak digital disruption for the food and beverage sector has started and will be experienced in the short term. Food delivery platforms have changed the way the way locals and travellers alike seek their meals and have increased the range of eat-in options. Research has found that around half of US adults have ordered food delivery in the past three months (Washington Post, 2016) and in the UK, half of people preferred staying in to eat (Express.co.uk, 2016).

While these trends reflect local attitudes, they are also likely to influence the same people when travelling. Travellers may look to stay in for a meal after a long day sightseeing, want to eat outside of normal dining hours, may not have appropriate clothes for a fine dining experience, or may want to reduce the language barrier of ordering food directly.

The food and beverage sector is also experiencing impacts from social media trends where locals and travellers seek picture-worthy food experiences. A positive social media presence is an increasingly important consideration in attracting customers and visitors.

Entertainment The peak impact of digital disruption on the tourism entertainment industry is expected to occur in the medium term.

As entertainment is increasingly occurring via digital channels, the potential ways for travellers to be entertained, and the types of experiences they seek, may not yet be understood or available. There is significant scope for over-the-horizon technologies to affect travellers' entertainment experiences, for example through augmented and virtual reality, through drones, wearables or autonomous vehicles to name a few.

Transportation The transport sector has already experienced significant disruption through the sharing economy, predominantly the disruption of the taxi industry by ridesharing platforms (such as Uber and Shebah).

However, while existing disruption has affected the way current transport options are delivered, the next wave of disruption will affect the transport modes themselves. For example, autonomous vehicles are expected to become more widely available in coming years, and urban air transportation via vertical take-off and landing (VTOL) aircraft could enable inter-suburb and inter-city transport. While the technologies for making these a reality are largely available, the regulation required for these technologies is likely to make them a longer-term disruptor.

3 Travellers' technology journey

A traveller's technology journey involves a variety of technologies at each stage, with different technologies or platforms used at specific checkpoints.

These checkpoints can be broadly categorised into five stages of a typical travel experience, as summarised in Figure 3.1. It is acknowledged that the journey is rarely linear – customers are likely jump between stages, experience them in a different order, return to earlier states or skip a stage entirely.

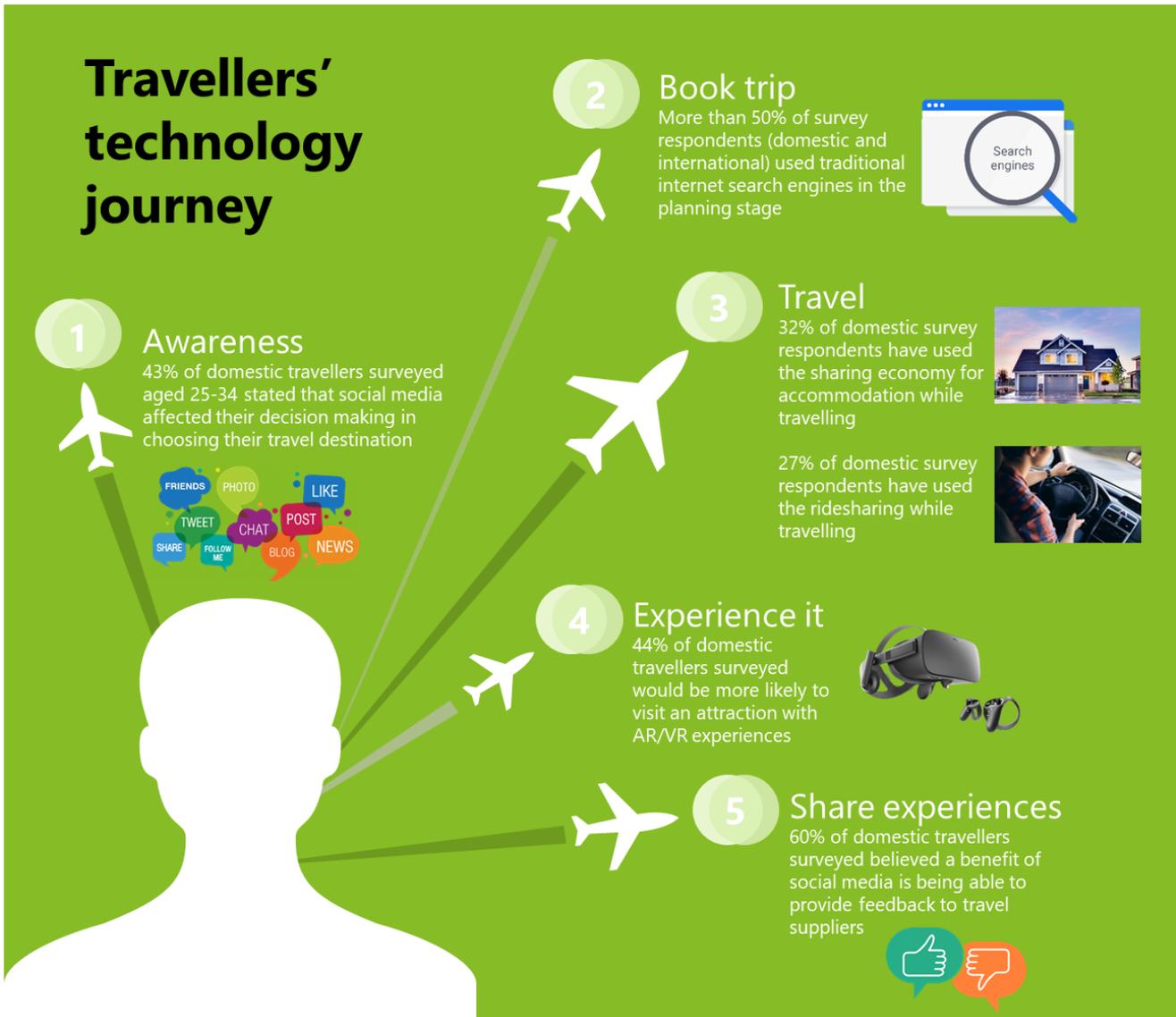
Figure 3.1: Customer travel journey



Purpose-driven technology usage means that the same technology can provide different activities and benefits depending on the stage of the journey. For example, social media activity looks different when a person is drawing inspiration for a potential trip to Tokyo, to when they are live-streaming a video in Barcelona. How embedded the technology is at different stages of the technology journey influences the value it provides in different contexts.

This chapter explores key technologies used at different stages of travellers' technology journeys.

Figure 3.2: Summary of the travellers' technology journey



Sources: Deloitte Access Economics, based on digimind (2016), Google (2016), IHG (2013)

3.1 Awareness 

Motivations to travel can arise from various sources. Some people become aware of potential travel destinations from peers' travel activity on a social media platform, or are prompted by other media content to further explore their travel options.

Visual experiences in the form of photos and videos are particularly compelling: 54% of leisure travellers said that pictures of a destination are important when choosing where to go, and 52% of Facebook users said that looking at their friends' photos inspired their travel plans (Google, 2016) (digimind, 2016).

Videos are also popular – according to Google, over 100 million of YouTube’s unique visitors each month are travellers, and travel vlogs are the most popular type of travel videos. Almost two in three people (64%) who watch travel-related videos do this while they are thinking about their next trip. However, more than just to gather inspiration, about 60% of travellers who watch online videos end up using it to narrow down their brand, destination, or activity choices.

While most travel vlogs currently don’t incorporate virtual or augmented reality, the proliferation of virtual reality/augmented reality (VR/AR) in content creation may further lift online levels of engagement during the ‘Awareness’ stage of the customer journey.

There could be opportunities for more brands to become content producers, (only 14% of vlogs on YouTube are created by brands whereas 86% come from YouTube creators (Google, 2016)). At this stage of the journey, consumers are not yet brand-committed. In fact, when consumers first start thinking about their trip, 78% of them will not have decided on the airline yet, and 82% will not have decided on an accommodation provider either (Google, 2016).

Scot’s Stretch or Splurge: Sydney Adventure web series

In Scot’s Stretch or Splurge: Sydney Adventure web series, Singaporean TV presenters Dominic Lau and Paula Malai Ali travel around Sydney. In the four minute videos, the duo choose between the options of ‘stretching’ their dollar or ‘splurging’ in their adventures around the Blue Mountains, Hunter Valley, Port Stephens, South Coast and Sydney. The campaign has been seen over 2 million times (Destination NSW, 2014).

Andrew Stoner, the then Deputy Premier and Minister for Tourism and Major Events stated that “Increased air services and targeted destination marketing campaigns have seen an increase in visitation from Singapore of 9.1 percent for year end June 2014” (Destination NSW, 2014). In 2014, there were more than 110,000 visitors from Singapore, which contributed \$203 million to NSW’s economy (Destination NSW, 2014).

When using smartphones for research, 72% of travellers report searching for the most relevant information and mostly disregard who – or what travel company – is providing the information. This brand-agnosticism highlights that provider choice is a highly flexible decision up until the point that bookings are made (Google, 2016).

A typical traveller’s purchase journey includes over 7,000 digital travel touchpoints over the 4 months prior to finalising travel plans, including 534 searches on Google and 1,400 images viewed. However, over 90% of these touchpoints are to visit online travel agencies, maps, metasearch travel sites and general search; less than 10% are cumulatively spent researching transportation and accommodation. Over 40% of travellers say they alternate between dreaming about different options and planning the trip in detail (Google, 2016).

In the awareness stage of the journey, there are opportunities for tourism operators to use visitor tracking data to boost less well-travelled, ‘undiscovered’ destinations. Tourism operators can gain insights into what

drives visitation to these areas and promote them by providing real-time suggestions to travellers based on their demographics, preferences and pattern of travel, supported by reviews from other users. Online biometric 'travel testing' could help provide information on people's preferences around potential travel destinations. One such product by Accor Hotels called Seeker, launched in July 2018, does this through a face-to-face exchange and five interaction stations. This test incorporates behaviour tracking and biometrics to build a psychographic profile of the traveller to suggest ideal travel destinations (Orwoll, 2018). These profiles help determine geographic and travel preferences based on factors such as adventurousness, extroversion, rustic/modern, rural/urban, and hot/cold.

3.2 Book trip



To make a trip actually happen, travellers need to make reservations and transactions. The ease and transparency of this process today is mixed, depending on the travel destination, online accessibility and functionality issues on both the traveller and provider ends (and where relevant, booking intermediaries).

For example, social media and payment systems could be better integrated, as currently only half of hotels link these two digital systems. There could also be improvements in mobile device experiences to support the ease of transacting. Where information is challenging to access on a mobile device, travel providers may struggle to attract visitors.

There are opportunities for travel providers to offer activities around flexible travel, that is, the option to not book, or to book while travelling rather than before. Over 4 in 5 travellers decide on activities after they arrive at their destination, so targeted and technology-based recommendations at the place of accommodation or virtually will help match travellers to flexibly make decisions.

Converting flight cancellations into customers

An average of 2-3% of US flights are cancelled every day, leaving an average of 90,000 travellers stranded. The Red Roof Inn hotel chain capitalised on this trend by using hyper-targeted mobile search strategies to advertise only to those customers with the greatest probability to book a room. An algorithm was developed to target travellers who were stranded due to flight delays or cancellations, providing the exact distance from the airport they were in to a Red Roof Inn.

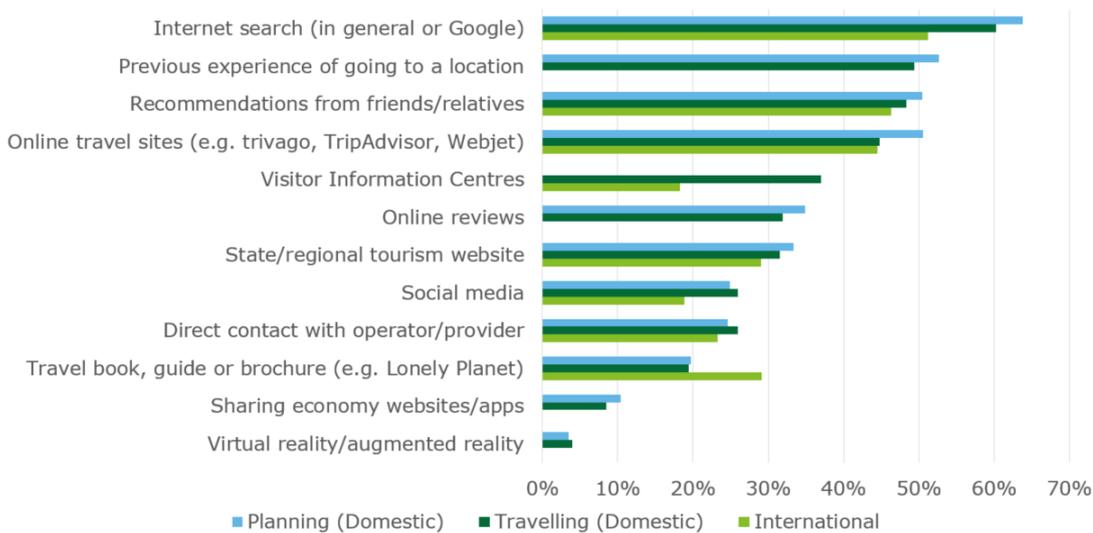
Overall, the campaign resulted in 375% increase in their advertising conversion rate (Mobile Marketing Association, 2014) Following in the success of this campaign, Red Roof Inn has also launched another technology-enabled campaign based on interstate traffic conditions to target traffic-jammed travellers who need a rest (360i,2018).

In the booking phase of the customer journey, mobile devices are increasingly being used to confirm and book various trip components. A survey by Google (2016) found that 40% of US travel website visits and 60% of searches for destination information originated from mobile devices. There is an opportunity for travel companies to acquire new customers during the booking phase; half of millennial travellers discovered a new travel company while researching on mobile (Google, 2016).

Smartphones are also enabling people to be more spontaneous when they arrive at their destination. 85% of US leisure travellers decide on activities only after having arrived at the destination (Google, 2016). Further, 85% of non-branded hotel Google searches that include the words 'today' or 'tonight' come from a smartphone, giving local tourism providers opportunities to advertise and take advantage of last minute bookings (Google, 2016).

Deloitte Access Economics' primary research shows that internet searches are the most common information source among domestic travellers while planning and during travel (see Figure 3.3). While general internet searches remain the main source of information for international travellers, the use of travel books, guides or brochures remain important information sources.

Figure 3.3: Use of technology among domestic travellers for information while planning and travelling



Source: Deloitte Access Economics, Research Now 2018
 Note: international respondents were not asked to respond to all options.

3.3 Travel



Travellers will typically engage a broad range of technologies during their trip, from the sharing economy, to virtual reality to social media.

The transport and food delivery sectors have experienced considerable change with the introduction and proliferation of sharing economy platforms such as UberEats and Foodora. Some sharing economy platforms, such as Hitchhiker, offer 'piggybacking' services, where travellers carry and deliver packages on their journeys around the world (Hitchhiker, n.d.). This can often mean that deliverer-travellers end up meeting locals and going to places they otherwise would not have visited. The sharing economy is not just about introducing ways to save money while travelling - the launch of uberElevate in the south of France and boat-hailing in the Mediterranean tap into the luxury personalised transport market.

Some travel systems have introduced virtual and augmented reality to simplify the process of navigating complex logistics. For example, London's Gatwick Airport has 2,000 indoor, battery-powered beacons that use augmented reality arrows to guide travellers on their smartphones to where they need to go inside the airport (Adobe, 2018).

Biometric facial recognition technology is being trialled in airport systems around the world to streamline passenger experiences. Both Singapore and Boston have airport systems that deploy biometric technology to enable hands-free flight boarding (Silk, 2017). In a partnership with Qantas, Sydney Airport has also started to trial new facial recognition technology at some of its terminals in 2018 (Sydney Airport, 2018).

There is currently a route from Aruba in the Caribbean to Amsterdam, the Netherlands, where biometric data stored at check-in are used to automatically verify travellers' identities as they pass camera stations at bag check, security and boarding gates (Silk, 2017), reducing the time required for manual verification. Subject to data security and privacy issues, there is potential for this technology to be expanded to check-in processes with hotels and other travel providers.

3.4 Experience



The increasing availability of technologies designed to enhance travel experiences in real time is expected to provide benefits for both travellers and travel companies.

Social media is used by travellers to post their experiences, contact suppliers and to a lesser degree, seek recommendations.

Virtual reality and augmented reality also play a role at this stage of the journey, enhancing traveller experiences in situ by allowing them to access perspectives and features not available in real life. There are, however, also potential reducing effects from increased VR/AR availability, such as replacing lived experiences, for example, if travellers decide to virtually

climb the Sydney Harbour Bridge and spend the foregone time and money on something else instead.

Visitor tracking has the potential over time to improve visitor experiences through the analysis of data from other travellers. There is also the potential for visitor tracking to increase travellers' interactions with and input into their travel environments and place-based travel activities, either pre- or post-experience, in the form of interactive maps and videos.

In addition to the traditional primary travel suppliers, there is increasing competition from new digital firms in the travel experiences market. These digital firms, such as Headout, Klook, Viator (owned by TripAdvisor), Get Your Guide and Airbnb's Experiences, utilise technology to create a targeted traveller experience.

There is potential for emerging technologies that bundle the technology offerings mentioned above into a single integrated travel experience. Amadeus, an information technology provider, is an example of a global travel company that processes behind-the-scenes queries on flights, hotel rooms, rental cars, and special deals to streamline the travel experience. Amadeus also handles details throughout a customer journey such as pricing, ticketing, bookings, and flight check-ins and departures. In 2016, the company processed almost 600 million travel agency bookings and flights for over 1.3 billion passengers (MIT Technology Review Insights, 2018).

Companies including Amadeus are increasingly turning to artificial intelligence and big data to digitise aviation, travel and other aspects of tourism, to create personalised and seamless customer experiences. The estimated benefits for customers and society from more intelligent and integrated customer travel are valued at up to \$700 billion, from allowing travellers to have a sustainable environmental footprint, safety and security measure improvements, and time and cost savings.

3.5 Share



Social media is a common way for travellers to "give back" to the circle of inspiration and raising others' awareness of new travel destinations and experiences (see following box on user generated content). Visitor tracking can also be a useful way of providing positive or negative feedback to travel providers of accommodation and tour services.

Facebook remains the most popular social media platform in Australia with 94% of social media users using Facebook. The growth in use of visual social media platforms like Instagram (from 31% in 2016 to 46% in 2017) and Snapchat (22% in 2016 to 40% in 2017) indicate that Australians are using more visual social media platforms (Sensis, 2017).

Selfies and food photos are the most popular posts on social media. 45% of Australians have shared selfies and 40% have posted food photos, with these figures nearly doubling among those aged 18-29, where 88% have shared selfies and 82% have posted food photos on social media (Sensis, 2018). MDG Advertising (2018) found that 60% of US travellers use social media to share photos while travelling. Jetsetter (D'Elia, 2015) found that photos are the most shared travel content on social media (48%), followed by reviews (18%), location check-ins (17%) and videos (12%).

The power of user generated content

Using the process of sharing their experience online, travel consumers become producers in the tourism experience. For example, an application called Sherpa turns the photos on Instagram into a travel guide (Sherpa, 2018). At its launch Sherpa had 500,000 geotagged photos and is currently working with 2,000 Instagram photographers (TechCrunch, 2017).

Tourism bodies can leverage this process as well. For example, the Texas Tourism Division launched a campaign 'nobody knows the state better than locals' to promote Texas as a premier travel destination using locals' photos and the hashtag #TexasToDo. Images were chosen to appear on TravelTexas.com, banners, Twitter, and as advertisements on boarding passes. The campaign resulted in a 33% increase in return visitation to the website since the launch (Olapic, 2017).

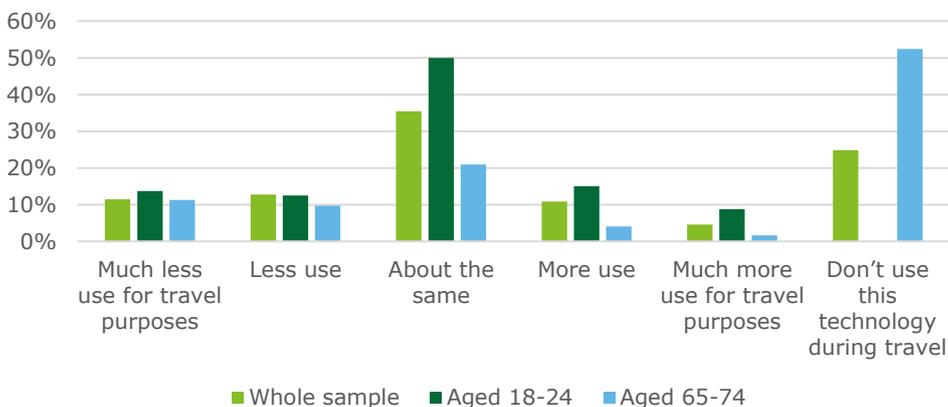
Tourism Australia has also done this in earlier phases of its 'There's Nothing Like Australia' campaign.

It is estimated that 200 new reviews are uploaded to TripAdvisor every minute (Kinstler, 2018). Many travellers share experiences, mostly in the form of reviews after travelling. MDG Advertising (2018) found that around two in five US travellers posted reviews after a vacation, 46% posted hotel reviews, 40% reviewed activities or attractions and 40% posted restaurant reviews.

Sharing experiences has become increasingly valuable. The Yellow Social Media report found that one in three Australians have been excited when their post has received more likes on social media than usual, with this proportion nearly doubling (63%) for those aged 18-29 (Sensis, 2018).

Intrepid (2018) found that 8% of Australians surveyed said their number one motivation to take an adventure travel was so they could have something fun to share with their friends and family on social media. They found that the youngest (18-24) and oldest (65+) age groups were even more likely (11%) to rank sharing this experience as their number one motivator in undertaking adventure travel.

Figure 3.4: Use of social media while travelling among domestic travellers, compared to individuals' day to day usage



Source: Deloitte Access Economics, Research Now 2018

Deloitte Access Economics' primary research found that three quarters of domestic travellers used social media while travelling, and about one third (35%) of travellers use social media as often while travelling as they do in their day-to-day lives (see Figure 3.4). Similarly, MDG Advertising (2018) found that 74% of US travellers use social media while on vacation.

Deloitte Access Economics' research also found that younger individuals are much more likely to use social media while travelling. For example, when segmented into age groups, 100% of domestic travellers aged 18-25 years used social media, in contrast to 48% of domestic travellers aged 65-74 years.

4 Sharing travel experiences in real time

Globally, more than 3 billion people – almost half of the world’s population – are active users of social media. The spread of social media continues, with an additional 362 million active users since 2017 (Kemp, 2018), equivalent to growth of around 1 million users a day.

Social media in various forms has been around for many years, and has achieved ubiquity in the last decade. The benefits of social media for tourism are clear and widely documented, with consumers and tourism suppliers more likely than not to have a social media presence.

In the next 5 to 10 years, social media will continue to evolve. As social media evolves, the ability of social media offerings to ‘stand out from the crowd’ creatively and technologically will become more important in attracting and engaging travellers. Deloitte’s Media Consumer Survey (2018) found that while 85% of Australians continue to be engaged with social media, daily social media usage has dropped to 55% and is now close to 2014 levels, with implications for using social media as a marketing channel.

On the other hand, consumers are coming to expect a social media presence from tourism suppliers, and the ability to contact them directly. In an increasingly online world, consumers are seeking ever faster response times from businesses – 52% of small businesses respond to customer enquiries and complaints within 10 minutes – and one-third of businesses consider 10 minutes to be the ideal timeframe (Deloitte Access Economics, 2017).

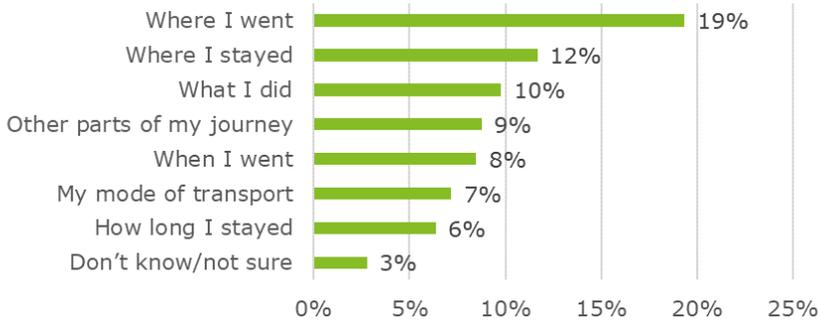
The tourism industry will also need to be mindful of the impact of social media on consumer expectations – of experiencing what they have seen online, balanced with delivering meaningful experiences.

4.1 Key research findings

4.1.1 Current and future use of social media

Deloitte Access Economics’ primary research found that social media influenced the decision making of 36% of domestic tourists (see Figure 4.1). Social media was most likely to influence where travellers chose to go (19%) or where they stayed (12%), but had less influence on mode of transport (7%) or duration of the travel (6%).

Figure 4.1: Influence of social media on domestic tourism decisions



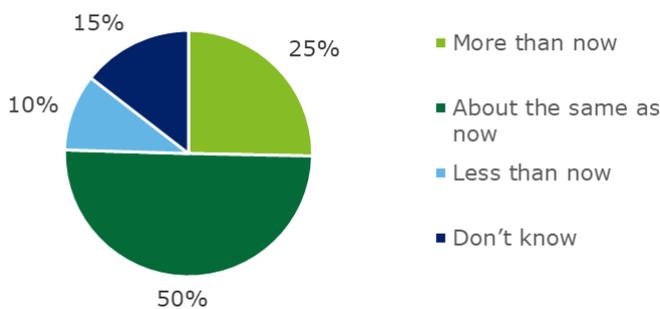
Source: Deloitte Access Economics, Research Now 2018, Note: For 64% of respondents, social media did not influence their decision making about tourism in Australia. Responses do not sum to 100% as respondents could choose multiple options.

The primary research also found that a number of domestic travellers report similar levels of social media usage during travel relative to their normal day-to-day usage (see Figure 3.4). On average, this was the case for 35% of domestic travellers. In comparison, this was the case for 50% of travellers aged 18-25 and 39% of those travelling for a holiday.

25% of domestic travellers did not report using social media while travelling, and use differs greatly across age groups. For example, 52% of domestic travellers aged 65-74 did not use social media while travelling, while this was the case for 0% of those aged 18-25.

Domestic travellers also expect that social media will be an important influencer on their future travel. Relative to their current use, 50% of domestic travellers expect to use social media about the same in making tourism decisions in the next five years, and a further 25% expect to be using it more (see Figure 4.2).

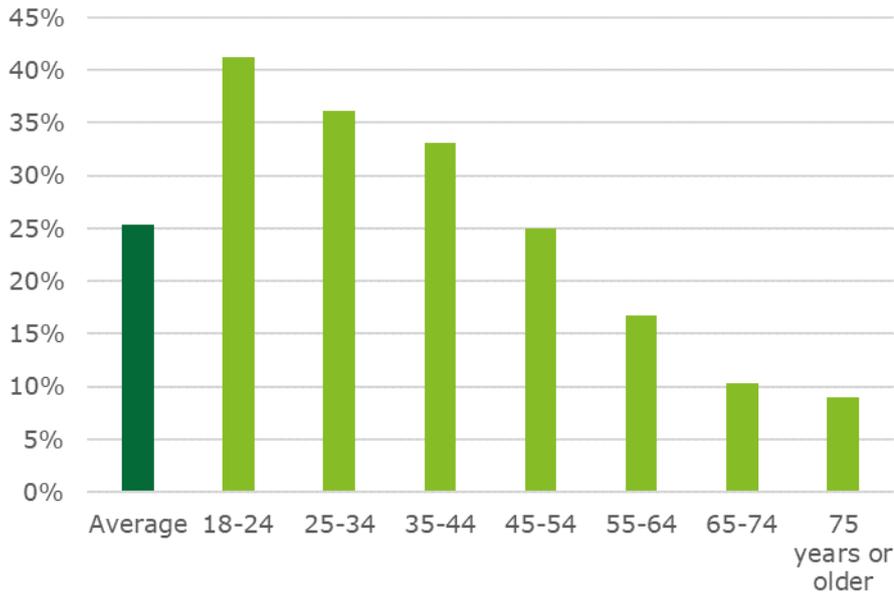
Figure 4.2: Expected use of social media among domestic travellers for travel decisions in the future



Source: Deloitte Access Economics, Research Now 2018

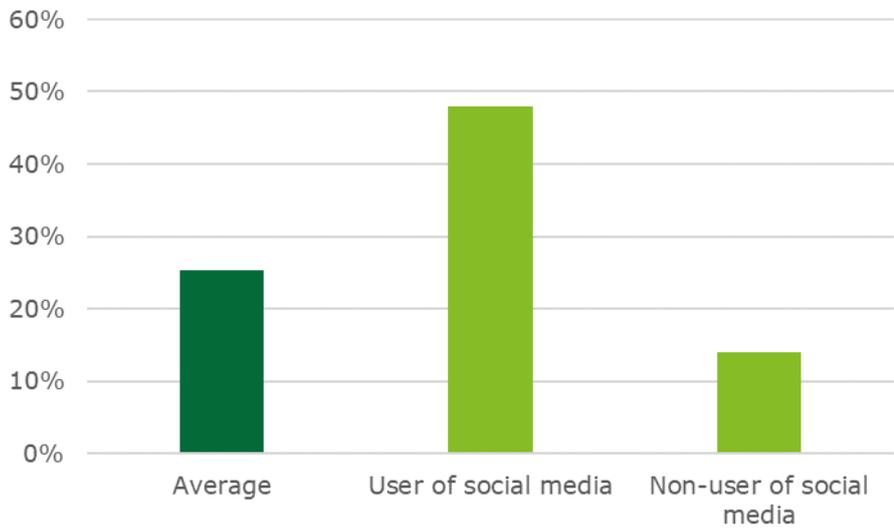
Younger people and those currently using social media are more likely to see their use of social media for tourism decision making increasing in the future; 41% of 18-24 year olds and 36% of 25-34 year olds expect an increase in use (see Figure 4.3), and 48% of current users expect higher use in future (see Figure 4.4).

Figure 4.3: Percentage of domestic travellers who expect to use more social media (compared to now) for travel decisions in the future, by age groups



Source: Deloitte Access Economics, Research Now 2018

Figure 4.4: Percentage of domestic travellers who expect to use more social media (compared to now) for travel decisions in the future, by users and non-users



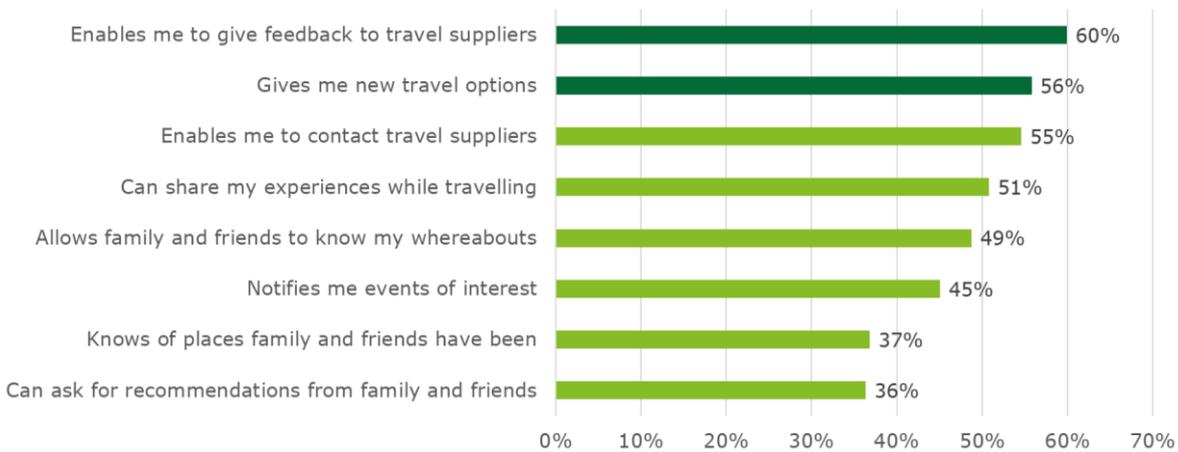
Source: Deloitte Access Economics, Research Now 2018

Note: here a 'user of social media' refers those respondents whose travel decisions were influenced by social media.

4.1.2 Use in planning trips

Deloitte Access Economics' survey found that one-third (36%) of domestic travellers consider the ability to use social media as a channel for seeking recommendations from family and friends as one of its key benefits (see Figure 4.5). However, this is but one of many benefits, with social media users being more likely to cite the benefits of communicating with travel suppliers - 60% cited the benefits of being able to provide feedback to travel suppliers and 55% reported the benefit of being able to contact travel suppliers directly.

Figure 4.5: Benefits of social media among domestic travellers

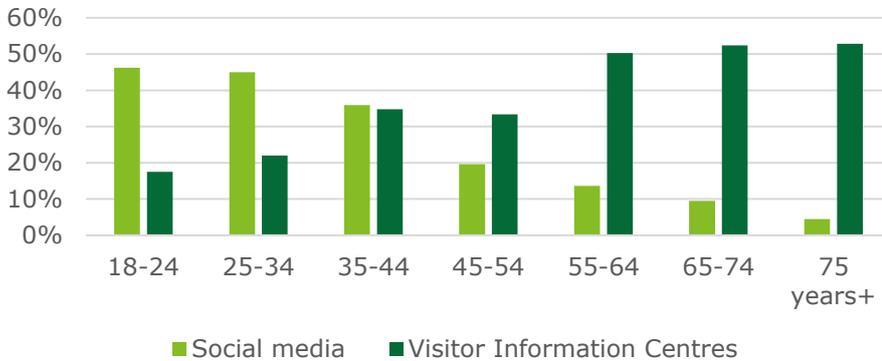


Source: Deloitte Access Economics, Research Now 2018

Around one-quarter of domestic travellers reported using social media as a method for gathering information while travelling. That said, one-third of domestic travellers reported using visitor information centres as a source of information while travelling, with 9% using both sources. This compares with other research in NSW which showed that 42% of domestic and international visitors used visitor information centres as a source of information either before or during their trip (Austrade, 2016).

Deloitte Access Economics' primary research also showed that the relative importance of social media as a method of gathering information for travel tends to vary by age cohort (see Figure 4.6), with younger people more likely to turn to social media to search for information while travelling, while older cohorts more likely to access information from visitor information centres. Those aged 35-44 were just as likely to use either source of information while travelling.

Figure 4.6: Use of social media and visitor information centres while travelling among domestic travellers, by age group



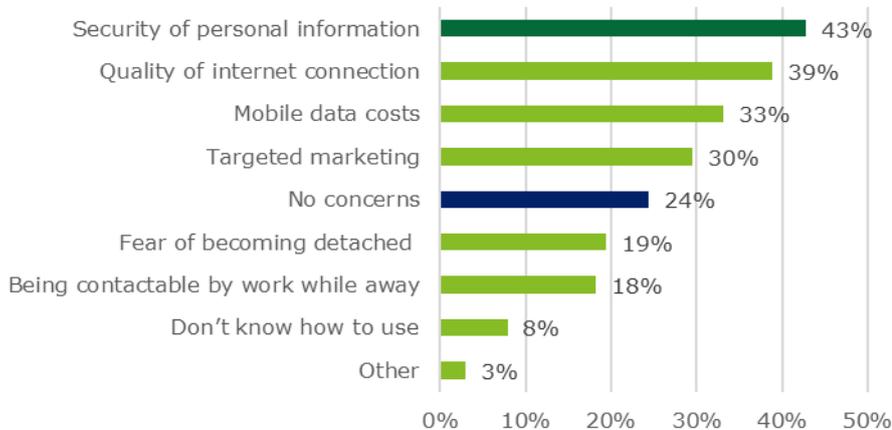
Source: Deloitte Access Economics, Research Now 2018

It is important to note that the use of information sources varies depending on the purpose of trip and destination with local and repeat trips requiring limited information. For example, when asked about whether they had attended a visitor information centre in person during their most recent trip, the National Visitor Survey found that 7% of domestic overnight visitors and 3% of daytrip visitors to/within Australia had do so. The International Visitor Survey found that this proportion was 19% for international visitors (cited by Victorian Government, 2019).

4.1.3 Barriers to social media use

Deloitte Access Economics' survey identifies that among domestic travellers, the greatest barriers to social media use during travel are the security of personal information (cited by 43% of respondents), the quality of internet connection (cited by 39% of respondents) and mobile data costs (cited by 33% of respondents).

Figure 4.7: Barriers limiting social media use among domestic travellers during travel



Source: Deloitte Access Economics, Research Now 2018

WiFi connectivity in hotels, and on airlines, is increasingly important to international and domestic travellers. International research finds that over 90% of business travellers expect WiFi access at their hotel, and one third

of business and leisure travellers would not return to a hotel with poor internet access (Social Hospitality, n.d.).

Gogo's Global Traveller Study (2017) found 39% of travellers cited inflight connectivity availability as the most important factor when booking a flight, rating this over traditional inflight entertainment options. Further, Gogo found that almost half of millennial travellers expect their connected experience in the air to be the same as on the ground.

4.2 Supporting research

4.2.1 Varying uses of social media

Social media platforms such as Facebook, Twitter, Instagram and Snapchat are used by people everyday, as well as during travel. When travelling, these platforms allow users to share their travel experiences and photos (including food, landmarks and attractions) with family, friends and followers in real time, subject to internet connectivity or WiFi infrastructure.

A 2017 study of UK social media users found that 72% of people post vacation photos on social media while travelling (see Figure 4.8).

Figure 4.8: Social media use while travelling



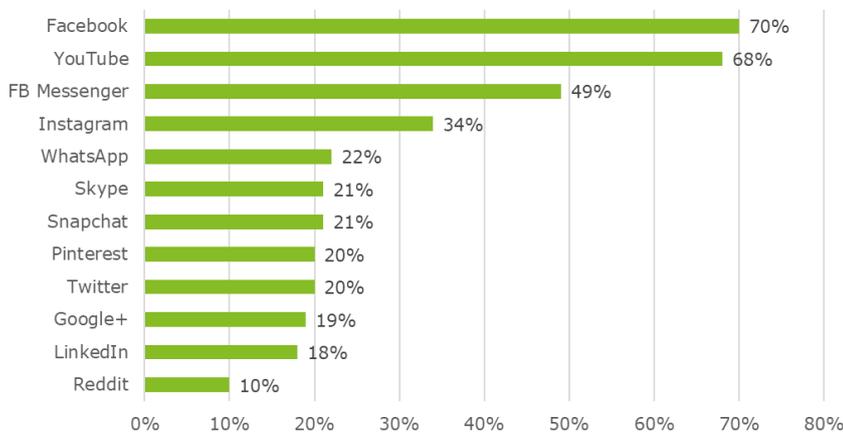
Source: Smart Insights (2017)

However, it is important to recognise that social media is not a homogenous product, and this affects the range of impacts and implications for the tourism industry. There are also different needs for sharing on different platforms. Beyond the most prominent networking sites, social media also includes:

- **blog/content creation** which includes development and sharing of new content, e.g. YouTube, Flickr, Lonely Planet blogs, personal blogs and individual websites;
- **collaborative projects** which share editable content and knowledge in a social way, e.g. Wikitravel, Lonely Planet forums, whirlpool and Fordor’s travel talk; and
- **feedback websites** which enable individuals to review or rate companies, experiences or locations via a platform e.g. TripAdvisor, Yelp.

As platforms have different key purposes, social media users tend to use and share on more than one platform. In Australia, Facebook and YouTube are the two most active social media platforms, as shown in Figure 4.9.

Figure 4.9: Share of internet users using social media platforms in Australia



Source: We Are Social (2018)

Another study found similar results. The Yellow Social Media Report (Sensis, 2018) which surveyed over 1,500 Australians found that 91% of social media users had a Facebook account, with the level of usage consistent across gender and age groups. Other social media platforms appeal more to specific groups. For example, males use YouTube, Twitter and LinkedIn more than females, while Instagram, Snapchat and Pinterest are more popular with females. These platforms are also less popular with individuals aged 50 and above.

4.2.2 Social media is a significant investment

Travel operators and destinations face a range of challenges in the use of social media. Successful management of brands on social media requires a significant investment in time, and sometimes a financial investment as well. Other potential challenges include:

- a conflicting relationship between the supplier’s culture and the social media culture;
- low levels of formalisation in how to use social media; and
- a lack of ‘know how’ resulting in trial and error processes by travel suppliers (Munar, 2012) .

Given tourists’ use of social media to contact tourism operators and provide feedback, the repercussions of poor service and risk of poor ratings are high.

4.2.3 Opportunities and risks

When done right, social media can lead to valuable opportunities for tourism operators and destinations. As a result of its reputation on social media, Lake Tyrrell in Victoria (also known as the sky mirror) has attracted significant

numbers of Chinese tourists, resulting in local and government investment in infrastructure to support an otherwise struggling regional area.

On the other hand, there are risks of tourists visiting through a digital lens, for example by seeking social media-worthy photo opportunities during travel, and not meaningfully engaging with their surroundings. Travellers seeking photo opportunities can cause management problems at some locations, for example, the Instagram-famous Wedding Cake Rock in the Royal National Park in NSW has attracted a number of visitors seeking the perfect photo, even climbing over safety fences to do so. Visitor management has overwhelmed NSW rangers, requiring support from NSW Police (Sas, 2018).

4.2.4 Global trends

In order to respond to the availability of new channels and changes in consumer behaviours and preferences, international markets are shifting more towards advertising on social media. The total share of spending on advertising in the US on social media grew from 25% in 2014 to 33% in 2018 (Del Gigante, 2018). Similarly, the proportion of advertising spending on digital platforms has also increased in the UK, growing from 8% in 2005 to 48% in 2016 (House of Lords, 2018).

Social media companies have been taking advantage of opportunities emerging in the growing Chinese digital market in China. In particular, they have been doing this through personalisation of content based on analysis of big data. The head of destination marketing at C-trip (a major travel booking platform) stated that “from dream to research to booking to sharing, it all happens within our platform. Big data is the foundation of tourism” (Bloomberg News, 2018). As C-trip, Weibo and WeChat are increasingly being used by Chinese travellers, travel suppliers need to be increasingly focussed on building their presence on these social media platforms to target Chinese travellers (Kantar TNS, 2017).

4.3 What’s over the horizon?

4.3.1 Evolution of social media

While 85% of Australians use social media, daily social media usage has dropped from a peak of 61% in 2016 to 55% and is now close to 2014 levels (Deloitte, 2018). In this time, privacy considerations have increased – 43% of Deloitte Access Economics’ survey respondents cited security of personal information as their biggest barrier to use. Further, there has been a shift away from sharing personal content, with communication moving towards sharing articles and memes (Kulkarni, 2017), and social media being increasingly used as a channel to contact suppliers.

However, while current social media channels may have plateaued or be on the decline, the channels are expected to evolve to meet consumer needs. This evolution will include more visual content (including more videos as opposed to text-based articles or photos), more mobile-native platforms, incorporation of AR/VR and the opportunity for users to opt for ‘premium’ or advertisement-free content (Kulkarni, 2017).

Consultations conducted with tourism and technology subject matter experts for this research suggest that the peak impact of social media on the tourism industry is expected to be felt in the next five years. These consultations also found that social media is expected to have small positive impact on tourism industry revenue and a large positive impact on influencing consumers’ decision making in the domestic tourism industry.

5 Rise of augmented/virtual reality

Augmented reality and virtual reality have the potential to inspire additional travel and enhance existing experiences.

Virtual reality (VR) and augmented reality (AR) are points on a spectrum between the real, physical environment and a computer-generated simulated environment. Augmented reality presents a simulated overlay on physical surroundings, while virtual reality involves real-time simulation of the user's senses (Yung & Khoo-Lattimore, 2017).

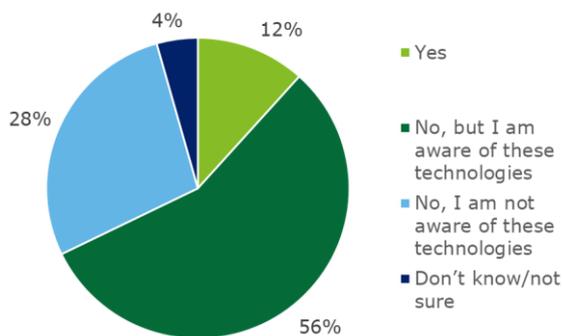
The difference between these different levels of reality and virtuality can be characterised by the level of visualisation, immersion and interactivity. (Cruz-Neira, Sandin, DeFanti, Kenyon, & Hart, 1992; Williams & Hobson, 1995).

5.1 Key research findings

5.1.1 Current and future use of virtual and augmented reality

VR and AR technologies are still relatively new. Deloitte Access Economics' primary research found that while more than two-thirds of domestic travellers are aware of the technologies, only 12% have actually used them while travelling. Older cohorts were less likely to be aware of the technologies (58% of respondents aged over 75 years, compared with the average of 28%).

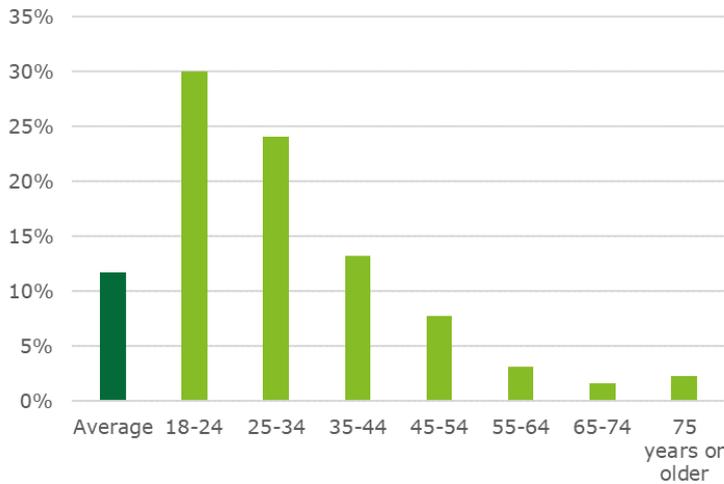
Figure 5.1 Current use of AR/VR while travelling among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Younger cohorts were more likely than average to have used VR and AR while travelling (30% of 18-24 year olds and 24% of 25-34 year olds), with use declining across age groups (see Figure 5.2).

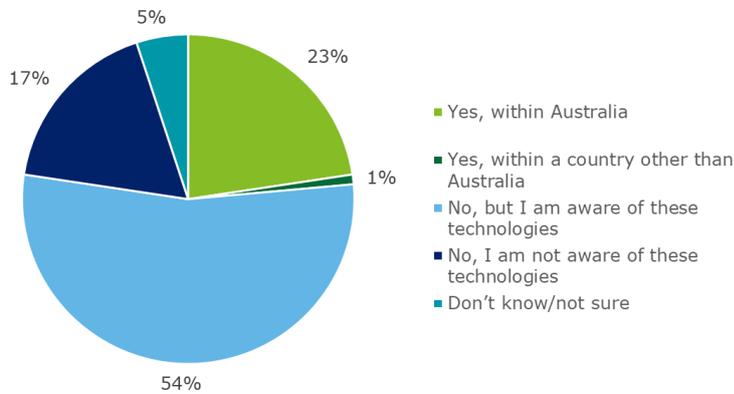
Figure 5.2: Percentage of domestic respondents who use AR/VR while travelling, by age groups



Source: Deloitte Access Economics, Research Now 2018

Interestingly, international travellers were almost twice as likely to have used AR/VR while travelling in Australia as domestic travellers (23% compared with 12%), and had slightly higher awareness of the technology overall (see Figure 5.3, in comparison with Figure 5.1).

Figure 5.3: Current use of AR/VR while travelling among international travellers



Source: Deloitte Access Economics, Research Now 2018

While current use of AR/VR in the traveller journey is relatively low, the primary research finds that one in five domestic tourists expect to be using AR/VR more in the next five years, with travellers providing similar responses for across both technologies.

People who have previously used the technologies are more likely to expect increased use in future - of the respondents who expected to use more VR in the future, 25% were current users of AR/VR. The primary research also shows that international tourists are almost twice as likely to expect to be using more AR/VR in their travels over the same time period. Chinese tourists are the most likely to expect increased use of these technologies, with three out of five expecting to use them more in the next 5 years. This has implications for tourism suppliers, with the potential to target AR/VR offerings to specific market segments.

5.2 Supporting research

5.2.1 Benefits for tourism suppliers

VR/AR technologies can be directly used for promotional purposes, adding value to the traveller's travel experience and also in tourism education and planning. For example, early use of VR by Destination Marketing Organisations and tourism industry associations sought to 'show' guests what destinations looked like to support the purchase decision.

There are also educational applications for AR and VR technology. The Hong Kong Polytechnic University's School of Hotel and Tourism Management has a campus on Second Life (see following box in section 5.2.3). It provides students and educators a cost effective platform which offers 'real-world' hospitality and tourism scenarios. For example, the students went on a virtual field trip to a Rixos Hotel in Turkey and role played the guest or hotel staff dealing with specific customer issues (Penfold, 2009).

Tourism planners can also use VR to inform policy decisions or potential infrastructure investments. For example, tourism planners can trial proposed routes, and test them virtually on subjects. The technology facilitates a new method of data collection, allowing tourism planners to gauge a realistic reaction of travellers in response to proposed plans.

AR can add a layer of guidance, content or entertainment using a device's camera to physical places, enriching the traveller's engagement and travel experience. For example, AR can help visitors navigate areas in their native language, maps and guides can be created for niche audiences, and AR can be used to provide additional historical and cultural context (Destination Think!, 2017).

VR/AR can also improve the accessibility of tourism experiences. For example, these technologies can allow someone with limited mobility to experience activities they could not otherwise participate in.

While VR tours can allow users to experience these locations before booking, in some cases VR could also be a substitute for an in-person experience, particularly as the quality of VR experiences improves. There are already virtual reality tours created for cities, landmarks and galleries (Booking.com, 2017).

VR experiences, in some cases, could play a role in ensuring the sustainability of sensitive travel environments. For example, virtual visitation to the Great Barrier Reef could reduce the physical impacts of visitation and make tourism more sustainable. However, it is possible that this use of VR technology could lead to "leaving the 'rich' with reality — ever more costly in terms of time and money, but also more gratifying — and the 'poor' with an easily accessible and reproducible virtual reality, but which does not provide a full sense of place" (Dewailly, 1999). On the other hand, VR may provide the opportunity for some people to have experiences which would otherwise have been unaffordable.

VR provides an opportunity to extend tourism experiences to those who otherwise would not have travelled due to accessibility, time or cost barriers. First Airlines, a Japanese tour firm, is offering a virtual trip from Tokyo to Paris in just two hours (the actual flight takes more than 10 hours). Users sit in a flight simulator, are served meals, and then use a high-tech VR headset to explore Paris. The experience costs JPY6,600 (around AUD\$80), and is particularly in demand by elderly customers unable to make the real trip due to their physical limitations (Travel Wire

Asia, 2018). It is unlikely that this experience is replacing physical tourism, as participants would have been unlikely to make the actual journey – rather, it has opened up a new tourism offering.

5.2.2 VR/AR examples

Travellers are increasingly demanding personalised, emotive and immersive experiences (Neuburger & Egger, 2017, pp. 241-242). Museums, in particular, are using AR technology to engage their visitors and improve the experiences they offer. Examples include:

- The National Museum of Australia's Kspace AR Trail app targeted at children, which encourages exploration of the museum to find virtual characters (The National Museum of Australia, 2018);
- The Australian War Memorial's plan to offer users interactive experiences of several of its artefacts, which will use AR to allow users to explore and interact with artefacts on its website. The Australian War Memorial aims to increase accessibility of information, promote empathy through the immersive experience and engage the younger generation through the technology (Council of Australasian Museum Directors, 2017); and
- The Smithsonian National Museum of Natural History's Skin & Bones app, which allows users to overlay skin on to the skeletons of animals and sometimes adds movement to bring them to life. The app aims to create a better tourism experience for users and also increases accessibility by allowing visitors to access the technology with trigger images from home (Smithsonian National Museum of Natural History).
- A study of the effect of AR usage at the Dommuseum Salzburg (Cathedral Museum) in Austria found that AR has the potential to enhance the travellers' experiences at the museum, with respondents reporting being more entertained and engaged, experiencing education benefits and a feeling of escapism while still having a meaningful experience (Neuburger & Egger, 2017, p. 252).

5.2.3 Case study examples

VR/AR can also influence travel patterns, as demonstrated through the worldwide Pokemon Go phenomenon, or present alternatives to travel in a virtual world (see following boxes). VR/AR can also help visitors plan, potentially improving their experiences. For example, Expedia is investing in VR technology as a new immersive method for travellers to book hotel rooms, allowing travellers to walk into the virtual hotel room, examine the amenities and the view from the room (Fortune, 2017). This helps manage expectations and can result in higher customer satisfaction.

Second Life “Your World. Your Imagination”

Second Life is a virtual world where people interact via avatars. It was founded in 2003 and designed to create a free space without limitations. Currently, it has around 600,000 regular users. In 2015, its economy was worth USD\$500 million.

Various studies have examined the allure of a virtual world. The study ‘Journeys in Second Life’ – Iranian Muslim women’s behaviour in virtual tourist destinations (Tavakoli & Mura, 2015) examines the tourist’s experience in a virtual world. The study found that the subjects were able to create a new identity through avatars in the virtual world. Some of these avatars challenged the women’s own cultural or religious values, allowing them to have a quasi-‘escapist’ experience within this virtual world. The study also found that through their behaviours some of the women felt an increased sense of perceived freedom in the virtual environment. They were able to visit places they couldn’t visit (due to Visa issues) or didn’t visit (due to fear of safety) before and did things they wanted to experience but didn’t want to actually do in non-virtual environments. In this case, VR creates a new world of travel, by overcoming accessibility barriers that exist within non-virtual travel. Linden Lab (the creators of Second Life) have now launched Sansar as the second generation of social virtual worlds.

There is also the potential for AR and VR technology to be a substitute for travel, reducing revenue for tourism suppliers. There is evidence that this is not currently holding the industry back, however.

The rise in popularity of virtual worlds has not gone unnoticed in the tourism industry with Sweden, Maldives, Estonia, Kazakhstan, Serbia, and Italy all having virtual embassies alongside hospitality organizations like Starwood, Hyatt, STA, and Crowne Plaza in the Second Life virtual world. As acquiring land to set up things like embassies and virtual campuses in Second Life requires real money, this is an indication that these entities view time and financial outlays in Second Life as a worthwhile investment. This signals the growing importance of virtual worlds in the tourism industry (Yung & Khoo-Lattimore, 2017).

Pokemon Go: "Gotta catch 'em all"

Pokémon Go, a mobile-based game, utilises AR to project virtual Pokémon on a user's physical surroundings, incentivising users to move around their local area and potentially travel to 'catch' rare Pokémon.

Pokémon Go represents an innovative application of AR in tourism. While not initially intended for use by or to impact on the tourism industry, the game increased visitation to local landmarks. One study found that restaurants near Pokéstops had high levels of customers compared to restaurants with no Pokéstops after the release of the game (Pamuru, Khern-am-nuai, & Kannan, 2017). Marriott and Expedia sponsored an individual to travel around the world to catch region-specific Pokémon (Weinberger, 2016). Specific Pokémon Go tours have also been created in cities (Red Balloon, 2018; London Guided Walks, 2017; Expedia, 2018).

The Pokémon Go phenomenon demonstrates the strong latent demand for AR interactivity. At its peak, the game had 45 million daily active users (BBC News, 2016). It was able to overcome two main issues with AR adoption – affordability and accessibility. The game's creators, Niantic, are developing a Harry Potter themed AR game, with potential to again impact the tourism industry. There are opportunities for tourism suppliers to engage with, and adopt, these technologies to provide new offerings to the market.

5.2.4 Challenges for tourism suppliers

For tourism operators, the challenges and risks of adopting VR/AR technology include the costs of the technology, skills for setup and maintenance, commercial considerations and impact on the visitor experience.

One major challenge in the widespread adoption of AR and VR technology is finding the right commercial model (Cranmer, tom Dieck, & Jung, 2017). While these technologies can improve the visitor experience, there are significant and ongoing technological investments required, and businesses must choose between providing these technologies to attract visitors and stay competitive, or charging for their use.

From interviews with stakeholders regarding the revenue models, Cranmer, tom Dieck, & Jung (2017) found:

- AR can be used as a marketing tool and target specific audiences
- AR can be used to generate secondary revenue by increasing the spending on-site and within the local area through increased customer engagement and retention
- it is unclear whether it was better to provide visitors with their devices or allow visitors to use their own devices
- there is debate over the optimal model, whether AR should be free and included in the experience or charged a fee as an extra to the travel experience.

Another barrier to suppliers adopting AR and VR technology is the belief that the technology will dilute the authenticity of travel products and experiences. As such, the quality of AR content is the most important criteria for its implementation within city guides or museums (tom Dieck & Jung, 2015).

A Queensland Government (2018) report on the impacts of AR on the state's tourism industry identified a number of recommendations, including:

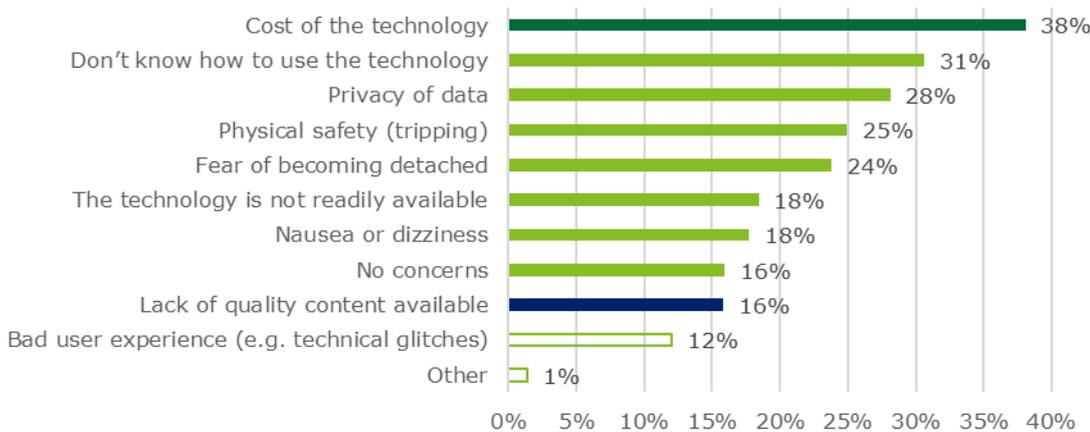
- for tourism suppliers to become more familiar with AR applications by understanding the factors that influences AR adoption by travellers, ensuring it is user-friendly and managing safety issues (both physical and privacy) associated with the application;
- for tourism suppliers to ensure and maintain the quality of content on AR applications and also ensure the content is tailored (or at least well matched) to its target market;
- for tourism suppliers to consider the potential of an all-in-one application that can be used across multiple travel destinations and experiences;
- for the government to increase the awareness of AR applications by cooperating with internal and external tourism stakeholders as well as conducting a focused marketing campaign;
- for the government to provide more technical support around AR applications; and
- for the government to become a mediator between tourism suppliers and technology companies. While cost remains high for most VR equipment, it is expected to become more affordable and ubiquitous over time.

5.3 What's over the horizon?

5.3.1 Reducing barriers

Deloitte Access Economics' primary research found that the top three barriers of AR/VR use for travellers (domestic and international) are the cost of the technology, lack of know-how around use and issues with privacy (see Figure 5.4). These reflect the relative novelty of the technology, with costs expected to decrease over time and understanding expected to improve as AR/VR becomes more widely available.

Figure 5.4: Barriers limiting AR/VR use during travel among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

For suppliers, the costs of AR/VR equipment and developing simulations are likely to price out smaller tourism suppliers, given the significant initial investment required and competitive pressures limiting the potential to charge for use by visitors. However, there is the potential for collaboration in the development of AR/VR content that could make this more cost effective.

Other concerns cited by travellers around the use of AR/VR included nausea or dizziness and bad user experiences. Faster internet speeds are expected to unlock the full potential of AR/VR technologies, with lower latency improving the experience of experience of AR/VR over time, reducing issues with lag (and hence nausea), and enhancing video quality (5G.co.uk, 2018).

5.3.2 Impact on future travel patterns

Deloitte Access Economics' primary research found that 44% of domestic travellers would be more likely to visit an attraction with AR/VR experiences, potentially inspiring additional travel, or additional expenditure while travelling.

However, if AR/VR technologies become more widespread, a third (34%) of domestic travellers believe that they will be less likely to make physical trips (see Figure 5.5).

Figure 5.5: Domestic traveller's perspectives on AR/VR



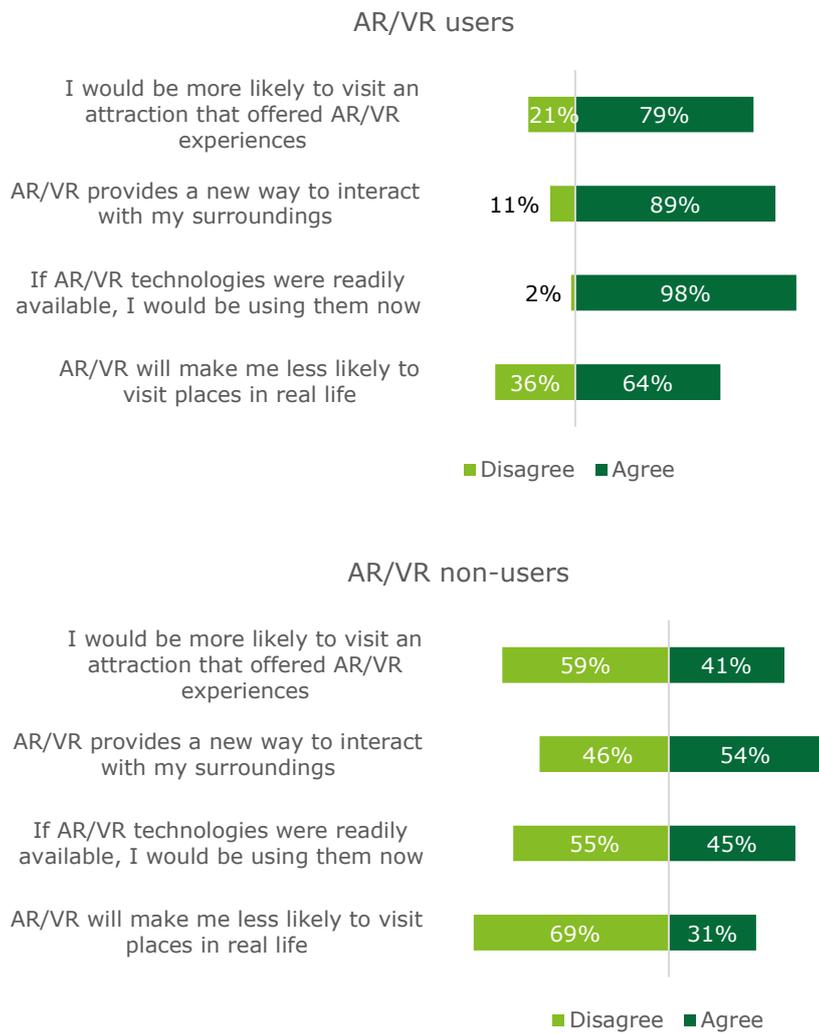
Source: Deloitte Access Economics, Research Now 2018

In particular, younger individuals (54% of those aged 18-24) and business travellers (47%) can see virtual experiences replacing in-person ones. The majority of respondents (61%) who had previously used AR/VR technologies while travelling also expect fewer physical trips in the future. This has important implications for the tourism industry in the changing nature of experiences, particularly in capturing future generations of travellers.

Splitting the responses by 'users' and 'non-users' of AR/VR, Figure 5.6 shows that those who have used AR/VR are more likely to be positive about using it in the future. For example, 79% of AR/VR users and 41% of non-users expect to be more likely to visit an attraction offering an AR/VR experience.

More than half of AR/VR users believe that AR/VR will make them less likely to visit places in real life compared to 31% of non-users. The large difference in opinions between 'users' and 'non-users' highlights the large extent the use of these technologies can impact the traveller's perspective on AR/VR in tourism in the future.

Figure 5.6: Domestic traveller’s perspectives on AR/VR, by users and non-users



Source: Deloitte Access Economics, Research Now 2018

Technology and tourism subject matter experts consulted for this research expect the AR/VR will reach their maximum potential impact on tourism in Australia in the next five to ten years, with the majority expecting that AR/VR will have a net positive impact on improving customer experiences and influencing the consumer’s decision making in the domestic tourism industry.

6 Growth and influence of the sharing economy

Sharing economy platforms have had considerable success in providing new accommodation, transport and food service offerings to travellers, disrupting the tourism and transport sectors.

The sharing economy platforms have been enabled by developments in information communication technology which have lowered the cost of transacting directly between buyers and sellers. This has given rise to platform applications that connect buyers to sellers; with peer-to-peer networks a key feature of the sharing economy.

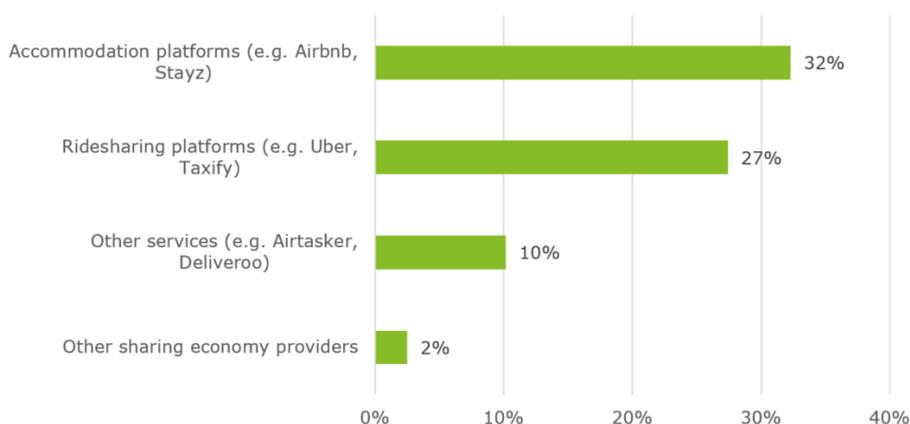
The focus of this chapter is on sharing economy platforms in accommodation, transport and experiential sectors. The chapter considers trends in its adoption, its impact on visitor demand, opportunities and threats and international experience.

6.1 Key research findings

6.1.1 Current and future use of the sharing economy

Deloitte Access Economics' primary research finds that half (49%) of domestic travellers have used sharing economy services while travelling. Of those who have used the sharing economy while travelling, Figure 6.1 shows that nearly a third of domestic travellers have used accommodation platforms (32%) or ridesharing platforms (27%) during their domestic trip.

Figure 6.1: Current use of sharing economy platforms while travelling among domestic travellers

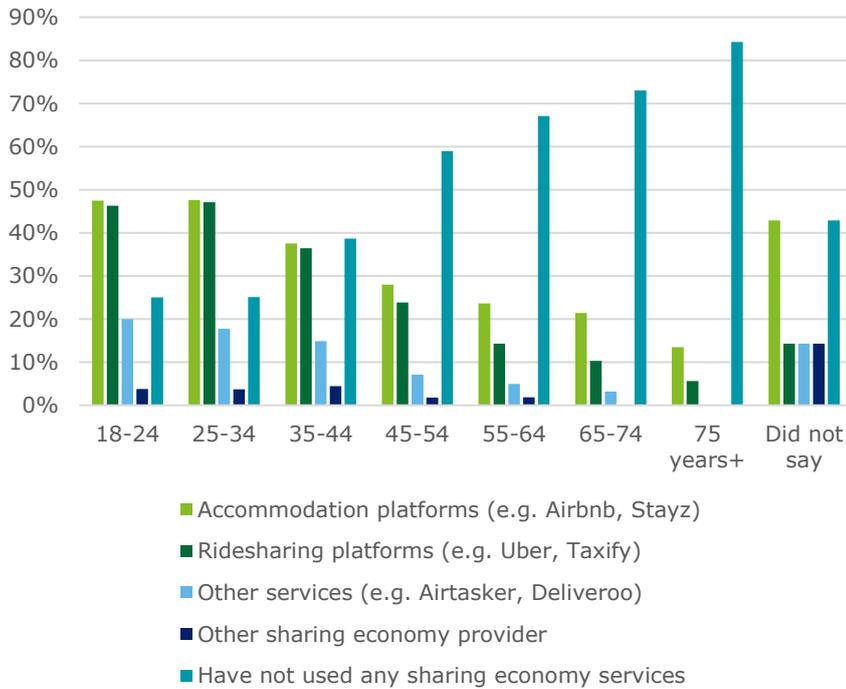


Source: Deloitte Access Economics, Research Now 2018

Note: 51% of respondents have not used any sharing economy services while travelling within Australia. Responses do not sum to 100% as respondents could choose multiple options among the types of sharing economy platforms.

Figure 6.2 shows that a higher amount of younger people used accommodation and ridesharing platforms while travelling, with the majority of users being aged 18-34. A lower amount of older individuals (aged 65-74 and 75+) used accommodation and ridesharing platforms.

Figure 6.2: Current use of sharing economy platforms while travelling by domestic travellers, by age group



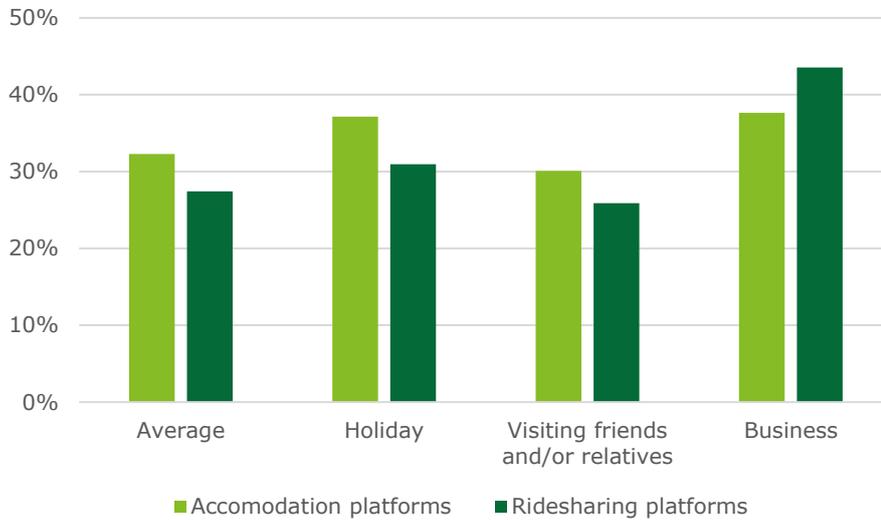
Source: Deloitte Access Economics, Research Now 2018, Note: the percentage of respondents in each age group do not sum to the total sample size as respondents could choose multiple options among the sharing economy platforms.

Individuals whose domestic travel was to a metropolitan area outside of their state of residence were more likely to use ridesharing platforms; with 38% of these individuals having done so compared to the average of 27%.

Of the domestic respondents who used sharing economy accommodation platforms, 40% travelled to a metro area interstate, while only 17% travelled to a regional area interstate. Similarly, 51% of those who used sharing economy ridesharing platforms did so in a metropolitan area interstate, while only 16% did so in a regional area interstate. This difference could reflect the relative availability of sharing economy services in regional areas.

The primary research also found that domestic holiday and business travellers were slightly more likely to use accommodation and ridesharing platforms while travelling. Figure 6.3 shows that 37% of holiday travellers used accommodation platforms and 31% used ridesharing platforms, while 38% of business travellers used accommodation platforms and 44% used ridesharing platforms.

Figure 6.3: Current use of sharing economy platforms while travelling by domestic travellers, by travel purpose



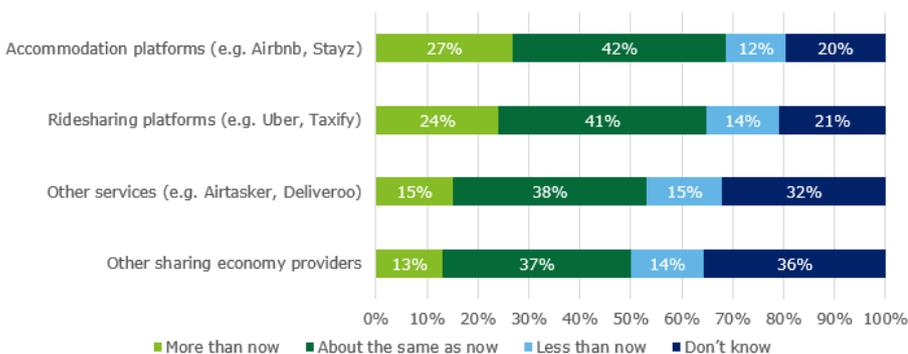
Source: Deloitte Access Economics, Research Now 2018

Individuals who use other technologies while travelling (such as social media, AR/VR and visitor tracking) were also more likely to use sharing economy platforms while travelling. For example, 51% of 'social media users' used accommodation platforms while travelling, compared to the average of 32%.

Figure 6.4 shows that in the next 5 years, domestic travellers are most likely to expect to use sharing economy services at a similar frequency to their current use.

However, it is important to note that these responses may not factor in innovation – for example, prior to the widespread emergence of the sharing economy, respondents would have been much less likely to expect to stay in a stranger’s house while travelling, while now it is a viable option. That said, 39% of survey respondents cited the need to trust strangers in their top 3 barriers related to the sharing economy, and 39% cited issues with personal safety. Behavioural changes towards the sharing economy can be slow (Wallenstein & Shelat, 2017).

Figure 6.4: Expected future use of the sharing economy while travelling among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

On the other hand, approximately a quarter of travellers expect to increase their use of accommodation and ridesharing platforms in the next five years. In particular, a higher percentage of younger individuals and individuals who use technology while travelling expect to use more accommodation platforms and ridesharing platforms in the future compared to their current use (among 35% to 40% of these individuals expect to use more of the sharing economy in the future compared to the average of 25%).

Consultations conducted with tourism and technology experts for this research suggest that the peak impact of the sharing economy on the tourism industry is expected to be felt in the next five years. The experts expect the sharing economy to have a large positive impact on revenue, improving customer experiences and on influencing consumers' decision making in the domestic tourism industry.

6.2 Supporting research

6.2.1 Sector growth

Transport sector

In the transport sector, sharing economy platforms connect passengers ("riders") and drivers through a mobile application. These services (also called "transportation network companies (TNCs)") have seen increasing growth in recent years.

In addition to Uber, Taxify, GoCatch, Shofer, Shebah and Ola, the Chinese ridesharing company DiDi has recently entered the Australian market. In Australia, the taxi and limousine transport industry is projected to generate revenue worth around \$5.5b in 2018-19 (IbisWorld, 2018). In 2015-16, Uber was estimated to have contributed about 6% of this point-to-point transport market (Deloitte Access Economics, 2016). The Centre for International Economics has assumed that ridesharing will reach 30% market share by 2019-20 (Deloitte Access Economics, 2016). If this were the case, ridesharing revenues in Australia would have been near \$1.65b in 2018.

Transport sharing companies are looking to increase scope beyond motor vehicles. For example, Uber has launched boat-hailing services in Egypt and Croatia, and has operated helicopters in the south of France since 2016 (Salinas, 2018). In India and Pakistan, rickshaws and motorcycles are similarly available on Uber. Both Uber and Lyft are in the process of awaiting permit approvals to operate electric scooters in San Francisco.

Accommodation sector

In the accommodation sector, in 2015-16, sharing economy hosts across Australia accommodated around 2.1 million guests for 3.7 million nights for over 800,000 stays (Deloitte Access Economics, 2017).

In the 12 months to February 2018, there was an 87% rise in total Airbnb listings across Australia (Farnsworth, 2018). However, sector experts think that there could be a saturation point for sharing economy accommodation. Morgan Stanley research in 2017 suggests that the pace of growth of Airbnb use is slowing in the US and Europe – the share of travellers who used Airbnb in the 12 months to 2017 has grown by 3% to 25%, a smaller rise than 8% the prior year (Sickel, 2017).

This slowing in Airbnb's growth could be driven by competition from other providers (such as HomeAway and FlipKey), though their market share is much more limited, as well as a saturation of accommodation sharing services in either or both host and traveller markets.

6.2.2 Sharing economy opportunities

Sharing economy platforms are looking towards expansion of services – rather than only providing services in one market, such as accommodation, they are moving to diversify into other areas. For example, Airbnb Experiences aims to match seekers and providers of tourist activities.

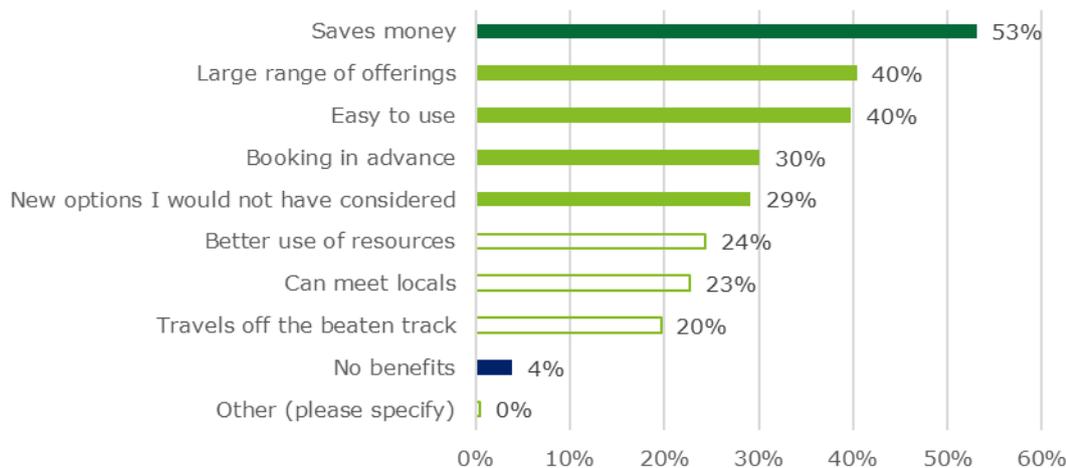
Experiences range from \$150 cooking classes to \$25 walking tours. Airbnb CEO Brian Chesky has said that Experiences represents a broader strategy to expand beyond being a “home sharing company” to being “an end-to-end travel company”.

Airbnb has invested \$5m in the US to expand Experiences. It is currently available through the app in 60 cities with around 5,000 tourist activities (generating \$2m in revenue in 2017), and there are plans to bring on 25,000 Experiences in 1,000 cities by year’s end (Reader, 2018).

6.2.3 Benefits of the sharing economy

Deloitte Access Economics’ primary research found that, for those that have used sharing economy services, the top three benefits are saving money (identified in the top 3 by 53% of respondents), the large range of offerings (40%) and ease of use (40%).

Figure 6.5: Domestic travellers’ top benefits of the sharing economy in travel



Source: Deloitte Access Economics, Research Now 2018

A 2017 report on the economic effects of Airbnb found that in central Sydney, Airbnb properties are on average \$88 cheaper per night, while this difference is \$50 per night outside central Sydney (Deloitte Access Economics, 2017).

The lower average price of sharing economy listings may encourage people to travel who could otherwise not have afforded hotel prices, or encourage more frequent travel, larger groups travelling together, longer trips or more days/nights spent in one location. In one study, 2 in 3 (67%) of respondents agreed that peer to peer accommodation expands their selection of places to travel, with the lower accommodation cost making more destinations affordable (Deloitte Access Economics, 2017).

More than 2 in 5 (41%) of respondents also agreed that peer to peer accommodation increases the frequency of their travel, mainly due to the social aspects of using peer to peer accommodation (Deloitte Access Economics, 2017). A 2016 survey undertaken across the US and Europe by

Morgan Stanley and AlphaWise also showed that 2% of trips would not have been taken if not for Airbnb (Deloitte Access Economics, 2017).

Lower prices paid for accommodation could also encourage people to spend more on food and other local tourism services. The same Deloitte Access Economics report estimated a cost saving of around \$26 million in 2015-16 for guests staying in Sydney who might otherwise have stayed in traditional accommodation. A proportion of this is likely to have been spent in areas of travel, driving local economic activity. Whether and how much of this cost saving is translated into increased spend by visitors is an empirical question and difficult to quantify.

The non-price benefits of ridesharing services could also affect the visitor volume, that is, "grow the visitor pie". For example, visitors who know that there is a reliable and affordable transport option in their potential travel destination may be induced to travel there. Deloitte Access Economics (2016) estimated that the UberX platform has achieved annual savings of 800,000 hours in wait time for consumers through its more efficient matching system compared to taxis. These time savings can enable tourists to spend more time actively engaging at tourism destinations or visiting more locations.

There are a range of reasons why these visitors could be induced into a tourism market that they otherwise wouldn't have visited if there are limited transport alternatives:

- **Safety.** Most transport sharing services have a range of features designed to decrease safety concerns held by passengers about taxis or public transport. These features include identification of drivers and passengers and the ability for passengers to share a real-time mapped route of their trip with friends and family. Removing the anonymity of transport provision could provide a credible deterrent to crime.
- **Coverage.** 64% of Uber rides start in 'transport deserts' located 800m or more from medium frequency public transport. In parallel, we know that three quarters of Airbnb properties in major Australian markets are located outside traditional tourist areas. Where these are not well integrated with existing ground transport, Uber could be playing a direct role in facilitating greater visitation in local areas "off the beaten track".

6.2.4 International experience

The Airbnb Friendly Building Program, launched in 2016, allows landlords in the US to authorise tenants to sublet on Airbnb in exchange for a share of the profits (Hempel, 2018). 26,000 housing units participate today, in return for a cut of between 5-15% of the host's profits. In 2017, Airbnb also partnered with a real estate developer to launch Airbnb-branded apartments designed for short-term rentals. In Paris, Airbnb's largest market, a new partnership with Century21 allows hosts who rent to request Airbnb-friendly leases which explicitly allow them to sublet an apartment on the platform (Hempel, 2018).

There is the potential for this to increase the size of the sharing economy in accommodation domestically if policy permits. However, there are local concerns which limit its expansion.

For example, within the Melbourne CBD and inner-city, short-term residents are more than three times more likely to be subject to complaints about behaviour than long-term ones", even as "legal remedies to neighbourhood disruptions are more geared for complaints against long-term residents" (Jericho, 2016).

Regulation is being considered in many Australian cities. South Australia and Tasmania are the only states that have regulated short-term rentals through Airbnb, and NSW planning policymakers and regulators are also responding. Planning Minister Anthony Roberts said “the Sydney cap was designed to mitigate against potential ‘unintended consequences’ on rental affordability” (Visentin & Smith, 2018). In June 2018, the NSW Government announced reforms to impose a 180-day cap on the number of days that empty properties can be rented in Sydney, and to give strata corporations the power to ban Airbnb in their buildings. Airbnb hosts must also submit data to the Department of Fair Trading.

On the other hand, regulation, city planning or simply consumer responses to public environmental concerns could pose threats to transport sharing services in the medium term.

A growing body of evidence suggests that ridesharing could be contributing to greater, rather than lesser traffic, carbon emissions and declines in public transport use (Sherman, 2018). A survey of nearly 1,000 users of transport sharing services in the Boston metro area found that over 40% said they would have taken public transport if Uber or Lyft had not been available, and 12% said they would have walked or biked (Bliss, 2018).

6.3 What’s over the horizon?

6.3.1 The future of transport services

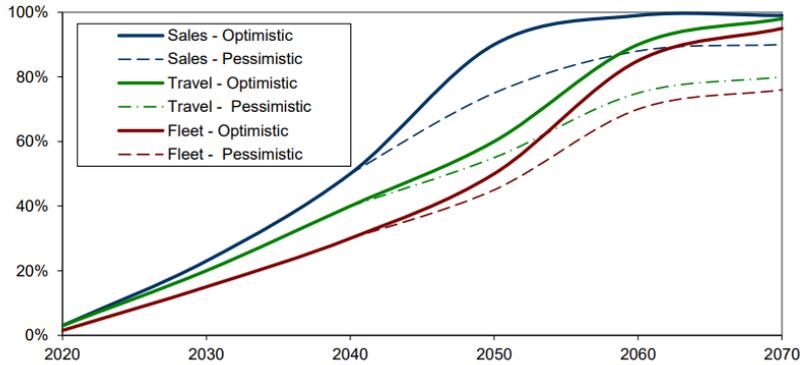
Currently, there are already a number of trials and pilots of intelligent transport systems in Australia (Intelligent Transport Systems Australia Incorporated, 2018).

For example, Transport NSW is currently looking within industry, researchers, councils and businesses to develop and co-deliver a number of connected and automated vehicles trials in regional NSW (Transport for NSW, 2018). These trials will focus on the specific benefits and barriers of connected vehicles and AVs in regional NSW. Other governments are also investigating how transport services will change in the future, with Infrastructure Victoria’s *Autonomous and Zero Emissions Vehicles Infrastructure Advice* examining the effects the transition to Zero Emissions Vehicles and AVs has on infrastructure, transport behaviour, land use and urban design (Infrastructure Victoria, 2018). This may have implications for the traditional tourism transport market as well as sharing economy providers.

6.3.2 Impact of autonomous vehicles (AVs)

AVs eliminate the difference between car sharing and ridesharing as it removes need for a driver. Once fully autonomous AVs reach commercial adoption, ridesharing and car sharing is predicted to converge as they both target similar customers, those who want the convenience and cost savings of accessing a ride or car nearby (Bert, Collie, Gerrits, & Xu, 2016).

Figure 6.6: Projections for AV sales, travel and fleets



If they follow previous vehicle technologies autonomous vehicles it will take one to three decades to dominate vehicle sales, and one or two more decades to dominate vehicle travel, and even at saturation a significant portion of vehicle travel may continue to be human operated, indicated by the dashed lines.

Source: Litman (2018)

However, autonomous technology is still developing and the technology for fully autonomous AVs is currently not available (Litman, 2018). Figure 6.6 shows that Litman (2018) predicts that the commercial adoption of AVs will begin 2020 in Australia and AVs will make up around 50% of vehicles sales and around 40% of vehicle travel by 2040.

7 The changing payments landscape

Emerging payment systems, such as payment via apps, PayPal and Tap'n'Go technology, are moving payment to the background, rather than interfering with customer experiences. The more straightforward the process for the consumer, the better.

These emerging payment systems have clear benefits for consumers, including domestic and international tourists, by reducing friction at the point of sale and leaving the individual free to enjoy the experience.

This trend has been seen in service sectors across the economy. Tourism services are leading the way in this regard – for example, payment for an Uber ride, Deliveroo meal or Airbnb stay are a discrete, automatic activity separate from the services.

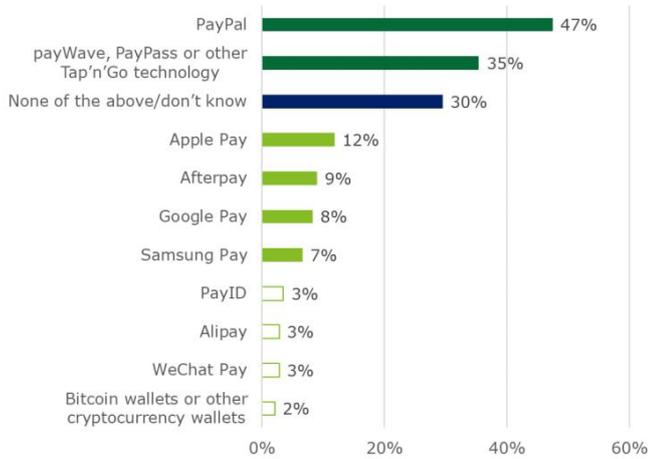
Technology has enabled a range of new payment options – from developments in system vendor technology to new payment processors and service providers. Of relevance to the tourism industry, key developments include digital wallets, Near Field Communications (NFC) and mobile point of sale.

7.1 Key research findings

7.1.1 Current and future use of emerging payment platforms

Deloitte Access Economics' primary research found that more than one third of domestic travellers used Tap'n'Go technology while travelling, and almost half use PayPal, though other emerging payment platforms are not as well known or used (see Figure 7.1).

Figure 7.1: Current use of emerging payment platforms while travelling among domestic tourists

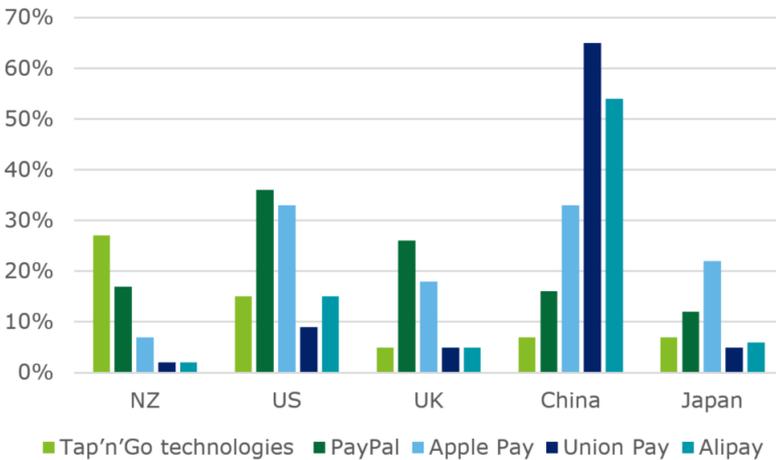


Source: Deloitte Access Economics, Research Now 2018

For international travellers, the primary research found that they were more likely to use Apple Pay, PayPal, Union Pay and Alipay while travelling in Australia, compared with domestic travellers. This likely reflects the prominence of these emerging payment systems in visitors' home countries, and the desire to use a familiar method of payment while travelling, or a reluctance to use foreign currency (either in the form of cash or travel cards).

Figure 7.2 shows the uses of the different payment platforms of international travellers based on their country of origin. PayWave, PayPass or other Tap'n'Go technologies were the most used emerging payment platform by respondents from NZ (27%). Travellers from the US (36%) and UK (26%) were the mostly likely to use PayPal. Of the travellers from China, 65% used Union Pay while travelling in Australia and almost 55% used Alipay. Apple Pay was the most used emerging payment platform by travellers from Japan (22%).

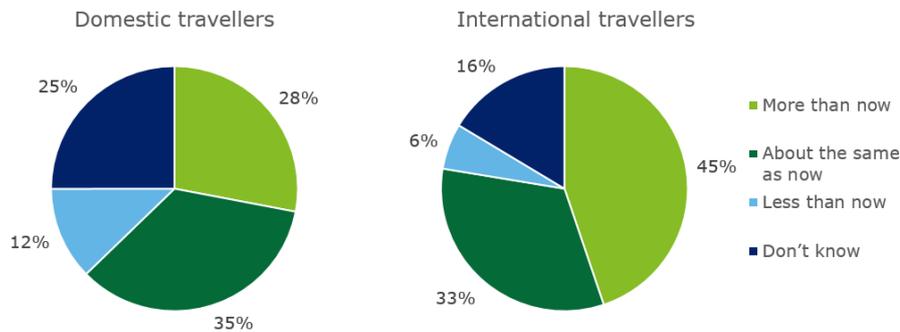
Figure 7.2: Current use of emerging payment platforms of international travellers while travelling in Australia, by country of origin



Source: Deloitte Access Economics, Research Now 2018

Travellers anticipate that their use of emerging payment systems in future will be at or above current levels. A quarter of the domestic travellers in the survey expected the use of emerging payment services to increase in the future. This increases to 45% among international travellers.

Figure 7.3: Future use of payment services (e.g Apple pay, Wechat pay)



Source: Deloitte Access Economics, Research Now 2018

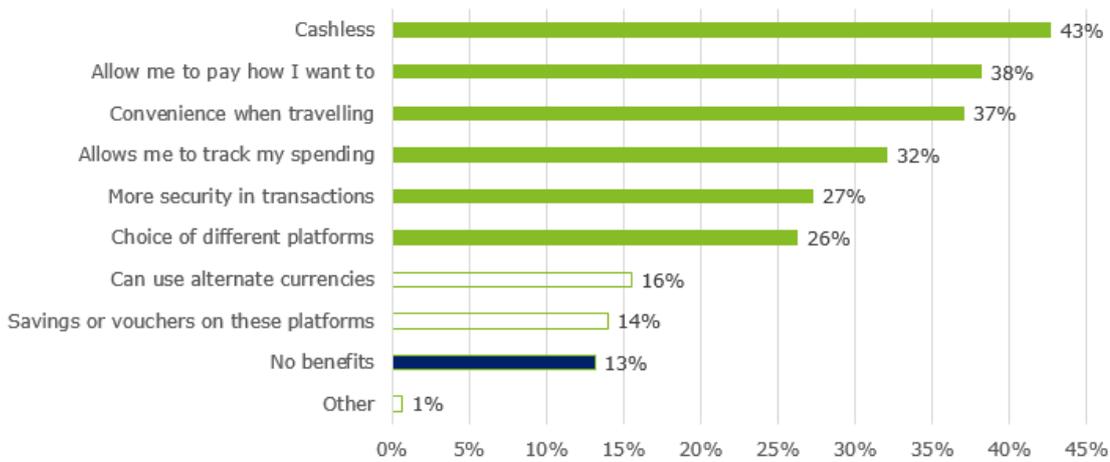
Among Chinese travellers, almost three quarters expect to use more emerging payment services in the future. The travel and retail sectors have recognised the opportunity presented by this market and have introduced new payment options. Examples include:

- Fashion brands such as Cue, Dion Lee and Veronika Maine now accept Alipay and WeChat in Australian stores. During Chinese New Year Australia was the biggest market for cross-border WeChat payments outside of Asia, reflecting Chinese tourists' preference for being cashless and using mobile payments when shopping overseas (Traill-Nash, 2018).
- To attract Chinese tourists, State and Territory Tourism Organisations have encouraged local businesses to adopt Chinese tourists' preferred payment platforms (such as WeChat Pay and Alipay) and advertised their destinations on these payment platforms.

7.1.2 Benefits of emerging payment systems

Consumers seek familiarity, an intuitive user experience and trust in their payment systems. When travelling, particularly overseas, consumers want, and expect, global interoperability. Deloitte Access Economics' primary research found that the top benefits of emerging payment platforms for domestic travellers are being cashless (cited by 43% of respondents), allowing travellers to pay how they want to (38%) and, of particular relevance, convenience when travelling (37%) (see Figure 7.4).

Figure 7.4: Benefits of emerging payment platforms for domestic travellers



Source: Deloitte Access Economics, Research Now 2018

7.2 Supporting research

7.2.1 Demographic trends in use of emerging payment systems

Emerging payment platforms have presented more options for travellers in how they choose to pay. In recent years, domestic travellers have shifted away from using cash to card to pay for holidays. As shown in Figure 7.5, there was a clear decline in the use of cash to pay for holidays over the last decade, and by 2017, almost 80% of payments for holidays were made by card.

Figure 7.5: Payments for holidays made by cash or card, Australia



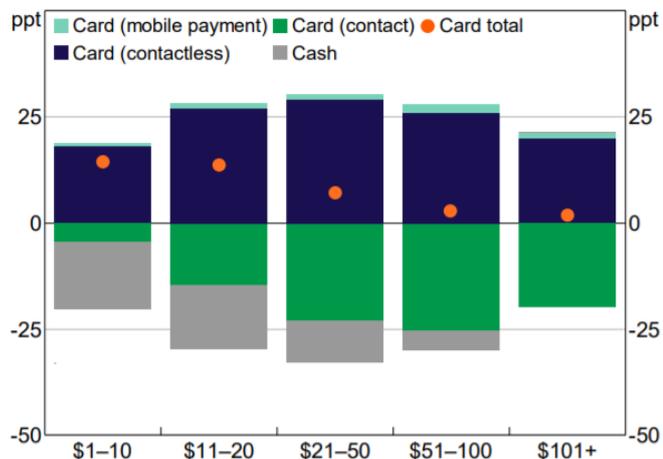
Source: Doyle et al. (2017). Note totals do not sum to 100 as other payment methods are used.

The Reserve Bank’s 2016 Consumer Payments Survey collects information on the day-to-day payments made by participants during a week. The survey found that older Australians (aged 65 or older) and those individuals living in low-income households are most likely use cash. It is expected that these cohorts are also less likely to be early adopters of emerging payment options.

The value of the transaction also affects preferred payment methods, with more than half of all payments between \$1-10 made in cash (Doyle, Fisher, Tellez, & Yadav, 2017). Contactless payments using NFC technology are starting to replace both lower value (less than \$20) cash payments as well as higher value card (contact) payments.

Research by Square (2018) found that contactless technology is now the preferred day-to-day method of payment for 51% of Australian consumers. There are likely to be similar factors driving payment methods during domestic travel.

Figure 7.6: Change in the share of payments by different payment methods and transaction size, Australia



Source: Doyle et al. (2017). Data reflects changes over 2013-2016.

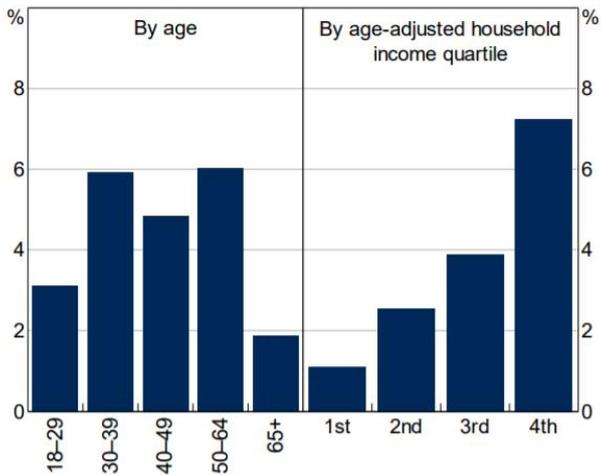
Mobile payment methods refer to using a third party digital wallet or banking applications and tapping a mobile phone over a card terminal rather than a physical card.

Recently, digital wallets have increasingly become available in Australia with most major banks launching their own digital wallets (such as CommBank Tap & Pay, NAB Pay) or working with third party applications¹ (such as Apple Pay, Google Pay, Samsung Pay, Fitbit Pay and Garmin Pay). This increased availability of digital wallets have also resulted in increased transactions, ANZ stated that 18.5 million mobile transactions were made in the first half of 2018 (with a value of almost \$600 million), a 156% increase in the number of transactions compared with the previous period (Johnston, 2018). That said, Square (2018) found that mobile wallets are still at the early adopter stage, with only 2% of consumers preferring this method of payment.

The Australian Government together with businesses has launched the New Payments Platform (NPP) (RBA, 2018) as part of the evolution of the payments landscape in a 24/7 digital economy. The NPP recently delivered PayID, an addressing service that simplifies the payment process by linking financial accounts to personal information (New Payments Platform, 2018). Figure 7.7 shows greater penetration of mobile payments amongst those aged between 30-39 and 50-64, and those from a high-income household. 10% of respondents have made or would make mobile payments, with the vast majority (90%) stating that they are satisfied with current methods or do not like the idea of mobile payments.

¹ Interestingly there is a shift towards working with third party applications. Both Westpac and ANZ had their own digital wallets, however, have now shut down this service asking consumers to use third party applications.

Figure 7.7: Percentage of respondents who use mobile payments, Australia



Source: Doyle et al. (2017)

7.2.2 International experience

India, traditionally a cash-dominated market, has seen a shift towards digital payments. Mobile wallet transactions have grown more than 50 times from being worth INR₹10 billion in transactions in 2013 to INR₹532 billion in 2017, and is expected to grow to INR₹32 trillion in 2021 (Deloitte, 2017).

The increased level of technology adoption, e-commerce growth and consumers' demand for convenience has resulted in a strong growth of the mobile wallet industry in India. Changes in regulatory conditions (such as the demonetization of currency notes) and policy measures by the Government of India and the Reserve Bank of India have driven the shift towards a cashless society.

In Europe, Visa's Annual Digital Payments Study (2017) found that more than 68% of people have used digital wallets, card-on-file services or mobile payment services. Within three years, 92% of Millennials are expected to be using mobile money. The top five types of merchants for mobile payments are restaurants, supermarkets, transit, convenience food and drink, and leisure and entertainment.

While much of the technology that enabling emerging payment platforms originated in the US, this market has not adopted emerging payment platforms as quickly as some other international counterparts. A survey of US consumers found that 76% of respondents identified PayPal as the most popular digital wallet (Statista, 2017). Contactless cards (using NFC technology) have experienced lower adoption rates than in Australia, reflecting barriers such as the different requirements across US financial institutions.

7.2.3 Supporting the visitor experience

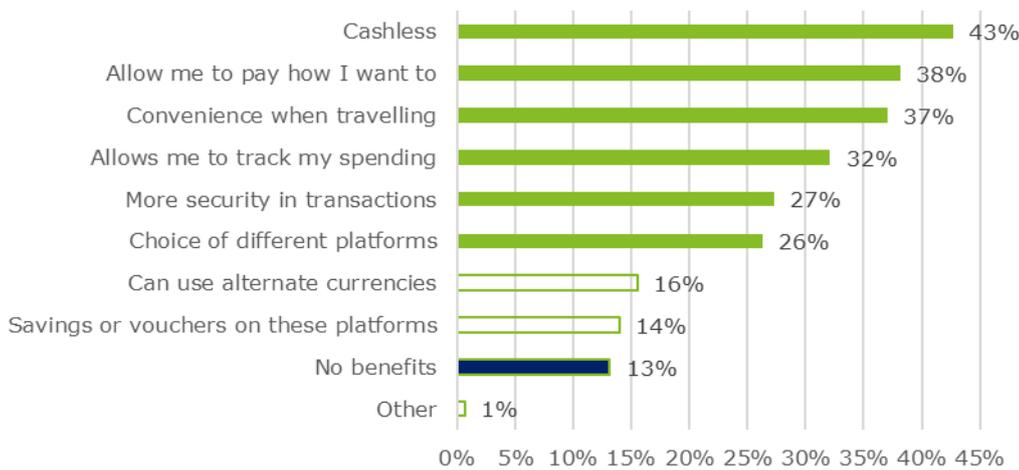
Security is an important feature of emerging payment platforms, with over one-quarter (27%) of domestic travellers identifying this as one of the benefits in Deloitte Access Economics' primary research.

Similarly, Westpac's 2016 Travel Finance Report found that safety concerns affected travellers' behaviour when paying. In the Westpac research, 83% of millennials surveyed changed their travel behaviour when they carried

large amounts of cash overseas (Westpac, 2016). The respondents were less likely to open their wallets in the presence of others, were reluctant to leave their bags at accommodation and were hiding money on their person (Westpac, 2016).

The shift towards digital wallets substituting physical cash can alleviate safety concerns and improve the visitor experience. Notably, Figure 7.8 identifies the top three benefits of emerging payment platforms are being cashless, allowing travellers to pay how they want to, and convenience. Even if a digital wallet device is stolen, the traveller can block its use remotely. Transactions using digital currency also leave electronic records which can be more easily stored and accessed when needed. For example, if the traveller was overcharged and found out after the travel, using digital currency instead of cash would make the subsequent process much more efficient.

Figure 7.8: Domestic travellers' top benefits of emerging payment platforms in travel



Source: Deloitte Access Economics, Research Now 2018

Digital wallets together with NFC technology can create a unified payment experience for travellers. Basili, Liguori, and Palumbo (2014) envision a holistic application called the NFC Smart Tourist Card which allows travellers to access to services such as "information supply, mobile payment, mobile ticketing, device pairing, location based services, access authorization, management of loyalty, bonus and membership cards". The combination of technologies will result in an improvement of the overall tourist experience with more seamless money management and mobility, access to complementary products and services (Basili, Liguori, & Palumbo, 2014, p. 251).

Paying for public transport can also be a challenge when travelling – visitors need to understand the local ticketing system, which can be time consuming and detract from the visitor experience. Transport for London trialled contactless journeys in 2014, and Transport for NSW is currently trialling credit card payments on ferries and light rail as an alternative to purchasing an Opal card.

Afterpay (see case study) is another example of an innovation that can facilitate purchases while travelling. It presents a buy-now-pay-later model to broaden the potential customer base.

Afterpay “There’s nothing to pay”

Afterpay is an Australian company that allows consumers to buy-now-and-pay-later. The majority of Afterpay’s customers are millennials and it has developed a loyal and growing customer base (AFR, 2018). This growth has resulted in adoption by a range of merchants - from David Jones to Dreamworld.

In 2017, Afterpay partnered with Jetstar. The head of Afterpay, Nick Molnar stated “There has been a clear shift in millennials share of the wallet towards service industries and more specifically towards travel ... and we believe the demand for Afterpay in the travel market will be very strong” (Yip, 2017).

Expanding from online purchases to physical stores, Afterpay has also partnered with Tyro, who supply EFTPOS terminals for small businesses (AFR, 2017).

Adopting technologies such as Afterpay can allow businesses to broaden their potential customer base. Emerging payment platforms have the potential to bring increased and new streams of revenue for tourism suppliers.

Ideally, emerging payment platforms should bring value to the tourist experience without complicating it (Seigneur, 2018). Cryptocurrencies, for example, enable anonymity of transactions and security through use of blockchain. Some examples of how cryptocurrencies are currently being used in tourism include:

- Australia’s first cryptocurrency town, Agnes Water-1770 (in Queensland), has the highest concentration of stores that accept cryptocurrency, using this as a way to attract ‘digital travellers’ and international visitors, allowing them to pay using cryptocurrency, effectively reducing the hassles of exchange rates, travel cards or similar (Finder, 2018). In addition the use of cryptocurrency ATMs allows visitors to make cash withdrawals from cryptocurrency holdings while overseas.
- In Japan, Bitcoin donations are accepted for the preservation of cherry blossom trees around Hirosaki Castle for the Cherry Blossom Festival. This allows donors to avoid international transfer fees, and does not require any identifying information, while ensuring donations are transparent and traceable (Pilkington, 2017).
- Some tourism suppliers in Thailand are accepting Bitcoin as an alternative and secure payment method, recognising traveller’s concerns regarding high incidences of credit card fraud (Helms, 2017).
- In Pakistan, a hospital has started accepting cryptocurrency as payment (Ahmed, 2017). There is potential for this to become more widespread as a method of anonymous payment and to securely store and transfer patient and legal information (Pilkington, 2017).
- Winding Tree, a ‘blockchain-powered decentralised travel ecosystem’ uses blockchain technology as a distribution platform in the travel industry. Winding Tree allows tourists to access inventory directly from travel suppliers (Winding Tree, 2017).

The barriers for travellers adopting emerging payment platforms include issues with availability of the technology and personal preferences.

While the technology for digital wallets and NFC have been available for a while, not all vendors have transitioned to accepting payments from these technologies. In Australia, NFC such as contactless cards have been widely

adopted and digital wallets are slowly being adopted. In other countries, due to the different structure of the banking industries, the transition to digital wallets and NFC has not been as fast. For example, a 2017 US survey on the various barriers of using mobile wallets cited that 22% of respondents did not know where they could use mobile wallets (Statista, 2018).

The slow and inconsistent roll out of these technologies mean that consumers are not able to use digital wallets and NFC even if they want to. For example, out of the major banks, only ANZ currently offers Apple Pay in its digital wallet (Eyers & Smith, 2017).

Personal preferences, such as habits in using card or cash in payments, can also be a barrier to travellers adopting these technologies. Similarly, lack of awareness or exposure to the technologies may contribute to privacy or safety concerns regarding the technology.

Research shows that the payment method of the first transaction of the day influences the method of payment throughout the day (Yeates, 2017). Where consumers and travellers become more familiar with emerging payment platforms, there is the potential to overcome existing concerns and increase the use of these technologies.

7.2.4 Barriers and opportunities

For tourism operators, the key challenges presented by the emergence of these payment platforms over the next 5 to 10 years are the costs associated with making them available, relative to the benefits of allowing consumers more ways to pay.

Tourism suppliers will face challenges in adoption of emerging payment platforms if banks and financial institutions do not support payments through these channels. To some degree, private sector innovations such as Square in the payment processing market can address these challenges. Square introduced pay-as-you-go payment processing instead of contractually based payment processing offered by most merchant accounts (Johnson, 2015). This has led to benefits such as cost savings, greater flexibility and choice from the emerging payment platforms.

With a number of emerging payment options, many tied to particular organisations or payment systems, suppliers are faced with the challenge of selecting which (and how many) to adopt. This requires an investment in the education of tourism suppliers to understand the advantages and disadvantages of adopting particular systems. Accepting more forms of payment can potentially increase the opportunity to attract customers, but this is not a linear relationship. More payment options result in increased hardware, software and administration costs, but does not necessarily translate to more revenue.

Identifying the most profitable payment infrastructure to offer tourists (particularly international tourists) will be a key challenge for Australian travel suppliers in the coming years. The payment infrastructure should be linked to the preferences of their target market(s), but it should also be noted that these consumer preferences may shift over time.

Visitor experience may also be affected by whether or not they have easy access to payment options that meet their needs and preferences. For example, the cashless experience of Uber is often regarded as major benefit for users (Solan, 2014) as it separates the transaction from the travel, avoiding waiting time to process payments.

The safety of these emerging payment platforms also poses a challenge for tourism operators. For example, a recent social media/credit card scam resulted in nine Victorian attractions reporting a total loss of more than \$350,000 (Australasian Leisure Management, 2017). Therefore, there is a potential role for the government to educate tourism suppliers on ways to mitigate these risks.

Suppliers can target and attract potential customers through loyalty programs that suggest timely and local offers. For example, tourism suppliers can use payment platforms to engage with potential travellers even before the purchase/payment process. The data from these platforms can also be used to analyse consumer spending patterns, which can provide information to tourism suppliers on the effectiveness of their advertising, details on the characteristics of customer base and their spending. Collaborative use of this data could enable wider scale analysis and inform machine learning forecasts regarding tourism spending.

7.3 What's over the horizon?

7.3.1 Increasing use over time

Increased availability of mobile payments methods resulting in greater familiarity may drive consumer uptake of mobile payments in the coming years (Doyle et al. 2017). Deloitte Access Economics' survey of domestic and international travellers found that the top benefits of emerging payment platforms were, for both cohorts, not having to carry cash and convenience when travelling.

Domestic and international travellers identified that data security and privacy remain major concerns regarding emerging payment platforms, and noted that they do not want to face surcharges for using these new payment methods.

Consultations with tourism and technology subject matter experts conducted for this research suggested that emerging payment systems will have an overall positive impact on reducing costs, increasing revenue and improving customer experiences in the domestic tourism industry.

8 Visitor tracking in the tourism industry

New technologies have enabled advancements in visitor tracking methods. New applications are regularly being introduced that are assisting in the understanding of visitor movements to inform product development and planning, ultimately improving the visitor experience.

Early versions of tourist tracking started in 1970s and 1980s using participant observations including diaries, mental maps, and interviews with the participant during their travels.

Other methods of visitor tracking have not directly involved participants, with examples ranging from data collected by researchers inconspicuously observing subjects' movements within a museum, to researchers physically tracking subjects on foot.

With advancements in technology, tools such as GPS, cameras, smartphones and sensors are increasingly being incorporated in visitor tracking. Subjects' movements can be monitored by an application on a mobile phone or an external physical device carried while travelling. These visitor tracking applications range from recording movements within attractions such as the Summer Palace in Beijing, across cities and towns such as Salzburg and Hong Kong and across islands including Vanuatu and Tasmania.

While the technology is now much more readily available, barriers have limited the use and take-up of visitor tracking in the tourism sector to date.

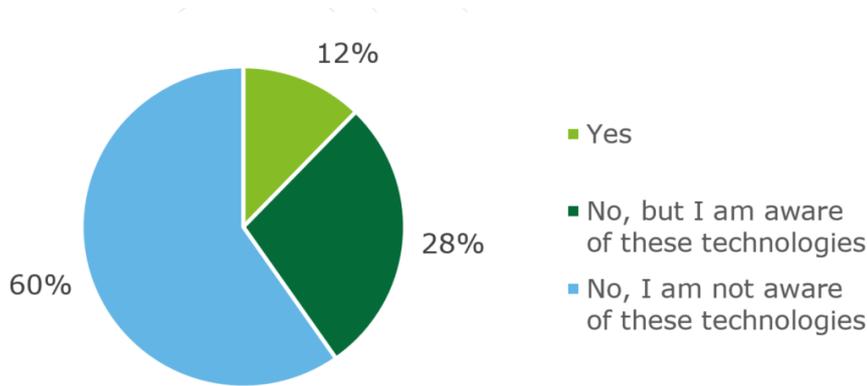
8.1 Key research findings

8.1.1 Current and future use of visitor tracking

Deloitte Access Economics' primary research found that the majority of domestic travellers are unaware of visitor tracking technologies. Figure 8.1 shows that 40% of domestic travellers were aware of visitor tracking technologies, and only one in ten had used visitor tracking while travelling.

The most likely users were younger (23% of those aged 25-34), social media users (28%) and AR/VR users (56%) compared to the average of 12%.

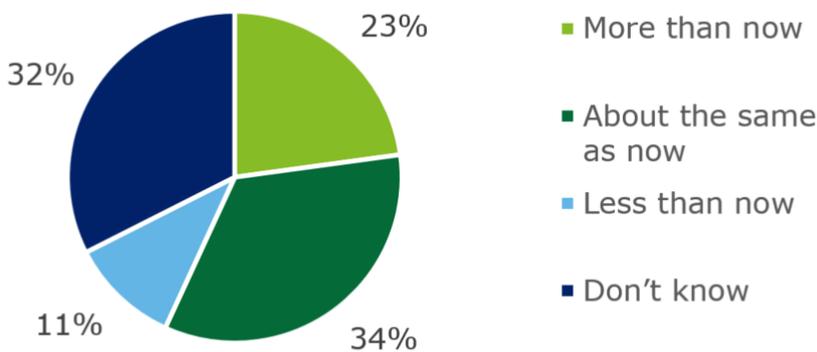
Figure 8.1: Current use of visitor tracking while travelling among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Further, the primary research found that domestic travellers are uncertain whether use of visitor tracking will increase in coming years. Figure 8.2 shows that one-third of domestic travellers (32%) are unsure of how much they will be using visitor tracking technology in the future. This is likely to reflect the early stage of use of the technology, a lower understanding of the technology, a lack of previous experience using it, as well as high perceived barriers to take-up. That said, one-quarter of travellers expect their use will increase.

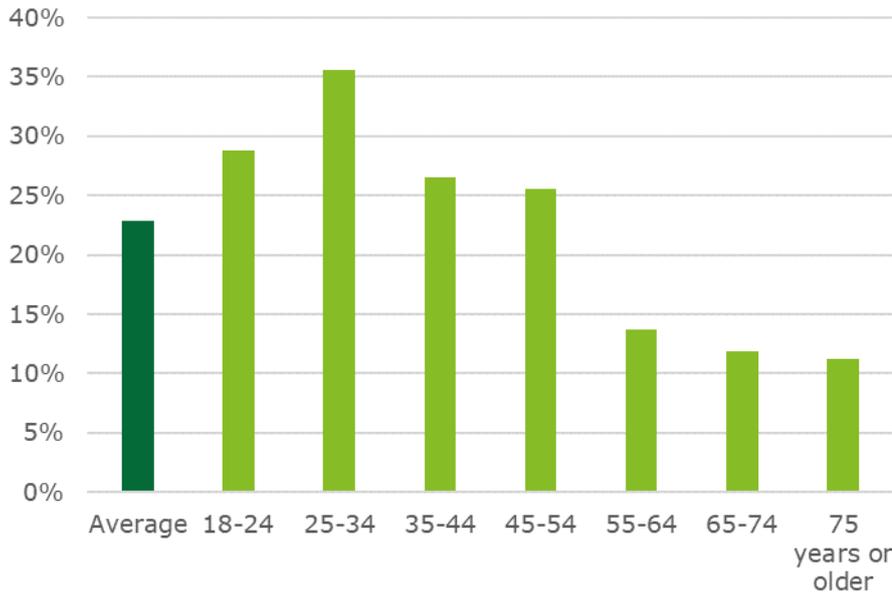
Figure 8.2: Use of visitor tracking in the future among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Deloitte Access Economics’ research found that younger people were more likely to expect to be using visitor tracking during future domestic travel (36% of those aged 25-34 thought they would be using it more than now, compared to the average of 23%) (see Figure 8.3).

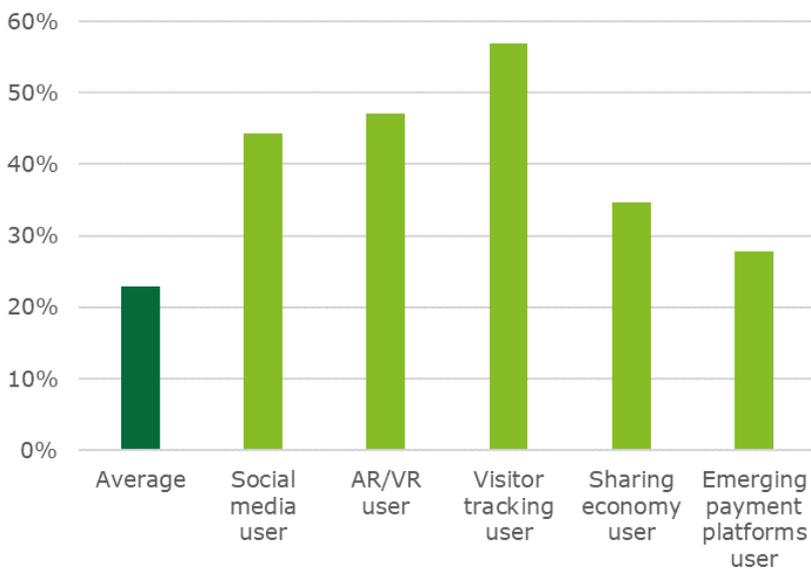
Figure 8.3: Percentage of domestic travellers who expect to use more visitor tracking (compared to now) while travelling in the future, by age groups



Source: Deloitte Access Economics, Research Now 2018

Those who had previously used the technology, and those who had used other technology disruptors during domestic travel also expect to use more visitor tracking while travelling in the future (35% of 'sharing economy users', 44% of 'social media users' and 47% of 'visitor tracking users' answered 'more than now', compared to the average of 23%) (see Figure 8.4).

Figure 8.4: Percentage of domestic travellers who expect to use more visitor tracking in the future (compared to now) while travelling, among current technology users



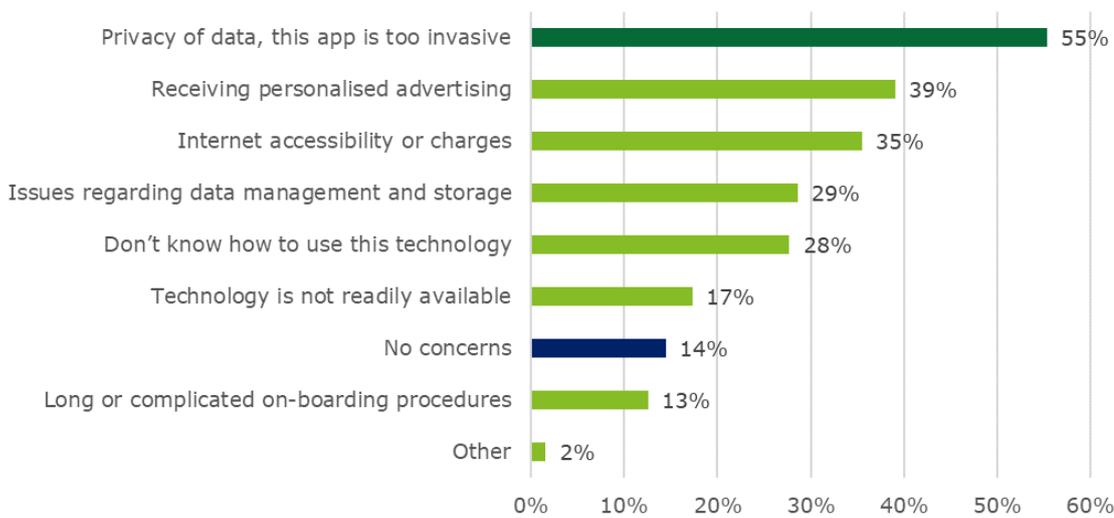
Source: Deloitte Access Economics, Research Now 2018, Note: here a 'social media user' refers those respondents whose travel decisions were influenced by social media.

8.1.2 Barriers to uptake

Deloitte Access Economics' survey found that privacy was a major concern related to visitor tracking with 55% of travellers citing the invasiveness of the application as a major barrier to their use of visitor tracking (see Figure 8.5). This highlights the importance for developers and tourism suppliers to ensure that users' privacy concerns are adequately addressed.

Other barriers to using visitor tracking include receiving personalised advertising (39%) and internet quality or charges (35%). These considerations were consistent across different cohorts of travellers (gender, age, purpose of travel, location of travel).

Figure 8.5: Barriers to use of visitor tracking among domestic travellers



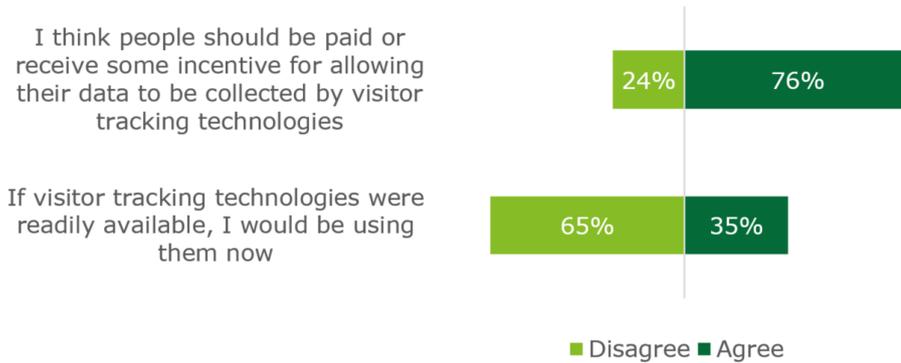
Source: Deloitte Access Economics, Research Now 2018

8.1.3 Benefits to drive user demand

As outlined above, only one in ten domestic respondents had actually used visitor tracking technology in their travels. As shown in Figure 8.6 availability of the technology is not its limiting factor, suggesting that the other cited barriers (as discussed in section 6.1) are more powerful in influencing visitor perceptions and use of the technology.

Figure 8.6 also shows that three-quarters (76%) of respondents agreed with the statement that there should be some incentive, financial or otherwise, for allowing their data to be captured by visitor tracking technologies. If the incentive or benefit is sufficient, it may be able to overcome the barriers to use and adoption.

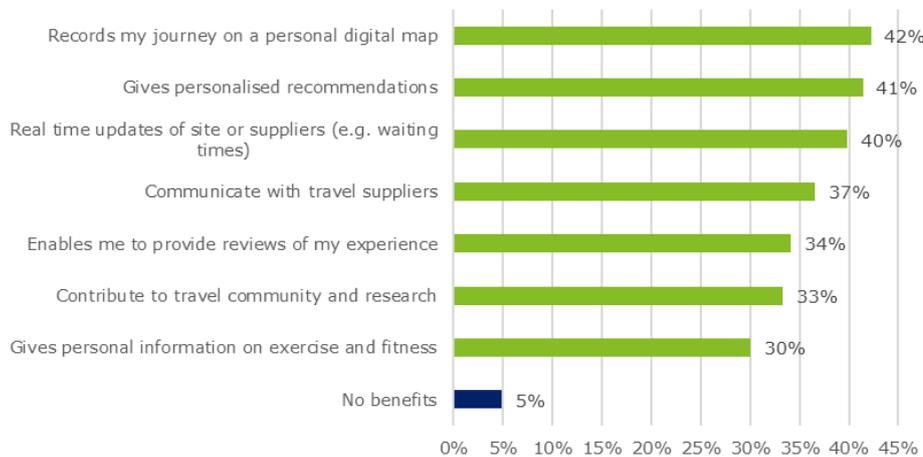
Figure 8.6: Opinions of visitor tracking among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Deloitte Access Economics’ primary research identified domestic travellers’ top three benefits from visitor tracking. Travellers who had previously used visitor tracking in their domestic travel identified the ability to record their journey on a personal digital map (42% of respondents), receiving personalised recommendations (41%) and getting real time updates (such as wait times) of sites or travel suppliers (40%) as the greatest benefits from using the technology (see Figure 8.7). These are examples of the types of incentives that the industry may consider to influence take-up of the technology.

Figure 8.7: Top benefits of visitor tracking in travel among domestic travellers



Source: Deloitte Access Economics, Research Now 2018

Further, the research reported that 33% of domestic respondents identified contributing to the travel community and research in their top three benefits. This highlights that there is also an altruistic aspect to participating in visitor tracking to improve others’ visitor experiences.

8.2 Supporting research

8.2.1 Benefits for businesses, government and researchers

Visitor tracking can allow visitors to comment on locations, services and their experiences in real time, as opposed to leaving reviews after their visit has been completed. These reviews can provide insights for locations and service providers.

Other stakeholders such as the government and researchers can also benefit from visitor tracking. Governments can use visitor tracking data to better understand visitor travel patterns, supporting decision making on infrastructure investments to support locations and required services in different regions. Researchers can also greatly benefit from the additional data collected from visitor tracking. Combining these new sources of data with existing datasets creates the potential for increased collaboration between the tourism operators and researchers.

8.2.2 Case study examples

Disney demonstrates a very successful use of visitor tracking technology in its MagicBands (see case study). The application provides the organisation with very detailed information about visitor movement and provides compelling benefits to visitors to the park.

Tourism Tracer, a research project into tourist travel, is another successful example of visitor tracking technology (see case study). Tourism Tracer differs in that it is used in a non-gated setting in Tasmania with clear entry and exit points.

Disneyland's MagicBands

In 2013, Disney announced the first MagicBands as a part of its wearable technology and Internet of Things MyMagic+ experience. These MagicBands are plastic bracelets that use radio-frequency identification (RFID) technology and acts as keys for hotel rooms, tickets (for park admission, FastPass+ and PhotoPass) and forms of payments. "With a simple swipe of the band across sensors located throughout the park, the giant system knows where you are, what you're doing and what you need" (Marr, 2017).

There are many benefits for users. For example, if visitors book and pre-order, restaurants can anticipate the arrival of guests and have food ready to deliver to their table upon arrival. Visitors reported that the seamless and efficient experience outweighed their hesitations about being tracked.

The benefits for Disney are significant as well. MagicBands are part of Disney's Next Generation Experience project, which aims to:

- drive operational efficient with a data driven approach
- transform the customer experience with analytics and wearable technology
- increase personalisation with connected products
- enhance interactivity across channels with a range of digital tools (The Leadership Network, 2016).

Disney has invested an estimated \$1 billion on the development and roll out of MagicBands. The data from their use allowed for improved ride management, enabling 3,000 more visitors per day to access rides during the 2013 holiday season (The Leadership Network, 2016). The data also allows Disney to direct and match cast members (staff) with areas of high traffic, and enables more personalised customer experiences, creating more value for the customer.

Tourism Tracer

The Tourism Tracer began as a research initiative called the Sense-T's Sensing Tourist Travel study is led by the researchers from the University of Tasmania (Sense-T, 2018). The study aimed to track the exact movements of visitors as they travelled around Tasmania, gathering "unprecedented insights into where groups of visitors go, how they move around, and what influences their decisions" (Tourism Tracer, 2018).

Specifically Tourism Tracer aims to use real-time sensor data of where tourists travel to provide the industry, regional tourism authorities and government with new intelligence to:

- improve marketing and infrastructure investment decisions
- identify emerging market trends
- inform strategies designed to increase the duration (and spending during) visits
- improve the visitor experience to Tasmania by allowing the provision of more timely and relevant tourist information. (Tourism Tracer, 2018)

Participants were recruited at the major entry points to Tasmania and were offered free data and a digital personalised and sharable Tasmanian map of their travels upon completion. The study mainly targeted domestic travellers and independent Chinese travellers.

The participants were given smartphones for the duration of their travels, which recorded their real-time location via GPS location information. The movement is so detailed that researchers can conclude how long someone stays at a lookout or browses an art gallery. The application can be used to capture the participant's personal reflections through pop-up surveys. The study also collected specific information through additional interviews of some participants at the end of their travels or after they have returned home.

The project surveyed the whole stay of travellers who stayed for 4 – 14 days in Tasmania. The huge scope of this study made it the largest GPS tracking of travellers spatially and temporally. Most GPS tracking of travellers are limited to a small geographic area and also a short period of time, usually one day. It has since surveyed more than 1,000 travellers over 2016 and 2017 (Tourism Tracer, 2018).

Some of the preliminary findings from this study includes:

- visualisation of where tourists go on the first day of their trip
- how travellers used social media along their travel journey
- different safety behaviours of different type of tourists by examining travellers who travel long distances in the dark
- the effect of weather on how travellers change their travel routes
- factors that influence the travellers' choice of itineraries
- choice of entry and exits points and its effect on dispersal within the travel journey (Tourism Tracer, 2018).

Over time, the Sense-T study developed into the Tourism Tracer project and has launched two additional projects, one project tracking visitors in Hokkaido in Japan and another tracking cyclists and their behaviours along the 274 km long Sydostleden/Southeast Trail in Sweden.

It has also been commercialised under Gulliver with the aim to use the underlying technology to create scalable commercial solutions (Gulliver, 2018).

8.3 What's over the horizon?

8.3.1 Improving the visitor experience

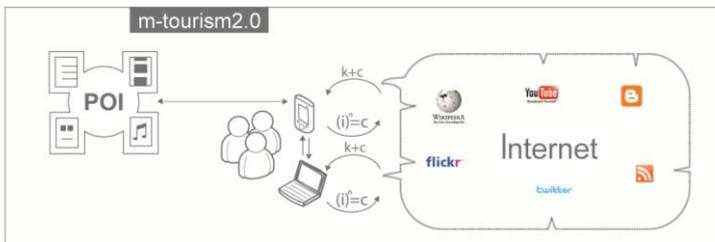
Through direct and indirect interaction with suppliers via visitor tracking technology, travellers can play a greater role in shaping the visitor experience.

Over the horizon, there is the potential for visitor tracking to be used in combination with other technologies. For example, in the future of tourism, known as 'tourism 2.0', travellers not only consume content produced by tourism operators, but become active producers of travel content themselves.

In combination with a trend of greater personalisation, the intersection of technologies has the potential to change the way tourists plan their trips, their travel behaviours while travelling and how they reflect post-travel. Beça & Raposo (2011) propose that the combination of e-tourism, m-tourism (mobile) and tourism 2.0 (see Figure 8.8) will "allow the tourists to communicate their perspective of what they are feeling and experiencing in any given moment and being able to share that information with someone who, may or may not, use that information for their own benefit".

In the visitor tracking context, Tourism Tracer users were provided with a digital personalised and sharable map of their travels and recorded experiences.

Figure 8.8: Schematic of m-tourism 2.0



Source: Beça & Raposo (2011). k refers to content provided by the tourism authority, while c refers to content provided by the tourists

Subject matter experts in the tourism and technology industries consulted for this research believe visitor tracking will have small positive impact on revenue in the domestic tourism industry, with the peak impact expected over the next five to ten years.

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