Chapter 5
Accommodation & Food Services

Subas P. Dhakal

Abstract Tourism industries, inclusive of the accommodation and food services [AFS] sector, are considered one of the main drivers of economic growth in Australia. Tourism industries collectively contributed over $100 billion to Australia's GDP and employed nearly one million people in 2019. One of the emergent issues associated with tourism industries is the Fourth Industrial Revolution (4IR) and the impacts of transformative digital technologies. Globally, it has been rightfully pointed out that digital technologies have advanced rapidly in recent years and are now considered as game-changers for tourism industries. However, although the business-centric view of digital opportunities associated with the 4IR has received significant attention, the policy-centric examination of the 4IR and tourism industries nexus remain under the radar in Australia. This chapter responds to this gap and draws on the three pillars of the Automation Readiness Index (EIU 2018a, b) – innovation, education and employment policies landscapes – in order to explore the challenges and the potential way forward for the AFS sector within tourism industries.

Keywords 4IR readiness · Accommodation and food services sector · Automation · COVID-19

Introduction

Tourism industries, inclusive of accommodation and food services [AFS] sector, are considered one of the main drivers of economic growth in Australia and are engaged in a variety of activities including but not limited to: travel agent service provision; tour operation; accommodation provision; domestic air service provision;

S. P. Dhakal (✉)
UNE Business School, University of New England (UNE), Armidale, Australia
e-mail: Subas.dhakal@une.edu.au

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international air service provision; cafe and restaurant operation, and hiring out motor vehicles (see IBISWorld 2020). Tourism industries collectively contributed over $100 billion to Australia's GDP and directly or indirectly employed nearly one million people in 2019 (AISC 2020). However, while the advent and proliferation of the digital economy is likely to accelerate the growth of tourism opportunities, bring the supply and the demand sides closer, streamline travel booking, transform marketing operations and reinvent the business models of different types of tourism enterprises (Guerriero 2019), tourism related occupations such as tourism & travel advisers are highly automatable and are likely to face potentially significant job losses in the future (FAETHM 2020). As discussed earlier in this book, the World Economic Forum [WEF] (2018) has argued that the world has entered the era of the Fourth Industrial Revolution [4IR] – the era characterised by 'a fusion of technologies that blurs the lines between the physical, digital and biological spheres' (Schwab 2017: 1). The extant literature on the 4IR and tourism industries nexus has primarily focused on to what extent technologies can help jobs to become more efficient and cost effective (Peceny et al. 2019; Pinzone et al. 2017). Although the techno-centric view has put a spotlight on the tourism opportunities associated with the 4IR, there is a limited understanding of its implications for Australia. This chapter responds to this gap and draws on the three pillars of the Automation Readiness Index (EIU 2018a, b) – innovation, education and employment policies landscapes – in order to explore the challenges and the potential way forward for the AFS sector within tourism industries.

The AFS sector is selected because it is (a) one of the fastest growing components of tourism industries in the past 5 years in Australia (Australian Jobs 2020) and (b) has a high automation potential (Muro et al. 2019). The chapter is structured in four parts, with the next section providing a brief overview of the tourism labour market, followed by a review of the 4IR and tourism industry-nexus. The subsequent section of the chapter describes the research study design and findings. Finally, the chapter will discuss the implications, including the context of an ongoing COVID-19 pandemic, before presenting concluding remarks.

Industry Overview

The United Nations World Tourism Organisation's [UNWTO] website characterises tourism as: a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which involve tourism expenditure (UNWTO n.d.: paragraph 1). This description indicates that tourism activities are complex and wide ranging in nature and involves multiple components. For example, as Table 5.1 depicts, tourism includes multiple components including but not limited to promotion, attraction, services, transport, accommodation, food, and retail. Nonetheless,

the Australian and New Zealand Standard Industrial Classification (ANZSIC) does not recognise tourism as one industry. According to the Australian Bureau of Statistics [ABS] (2012), industries are defined on the basis of the primary goods and services that they produce, whilst tourism instead is defined according to the status of the consumer, that is, the characteristics of the consumer determine whether the production is included within the scope of tourism (paragraph 1). In line with the argument made by Leiper (2008) that tourism industries is a more appropriate term and the singular expression is misleading, the likely rationale for the ABS is the fact that tourism activities bring together diverse components that directly or indirectly cater to the needs of the tourists or consumers and their actual tourism related experiences (Table 5.1).

Employment Trends

According to Tourism Research Australia [TRA], there were 302,520 tourism-related enterprises in Australia accounting for about 13% of a total of 2.3 million enterprises in the country (TRA 2019: 2). Micro enterprises with up to four employees, and small enterprises with 5–19 employees made up about 95% of total tourism-related businesses and accounted for 38% of the workforce in 2018. Whereas medium enterprises with between 20 and 199 employees and large enterprises with more than 200 employees made up 5% of the total businesses and accounted for 62% of the workforce (TRA 2020: 3). The latest World Travel & Tourism Council's [WTTC] country report on Australia indicates that tourism industries collectively

Table 5.1 Main components of tourism industries

Components	Examples
Attraction	Natural capital i.e. national parks
	Built capital i.e. monuments
Promotion	Marketing
	Communications
Services	Travel agents
	Event managers
Transport	Airlines
	Train
	Ship/cruise
	Taxi services
	Car rentals
Accommodation	Formal i.e. hotels, motels
	Informal i.e. Airbnb
Food	Restaurants/cafes
	Takeaway

Source: Author

contributed to nearly 11% of the total economy and supported over 1.6 million direct and indirect employment jobs (WTTC 2020:1).

The ABS collects and reports labour market data under the umbrella of Tourism Characteristics Industries and Connected Industries. The employment figures for the financial year 2018–2019 indicated that 666,000 people were directly employed in tourism industries, with most jobs (52.5%) being full-time and slightly more female (54%) compared to male (ABS 2019). Tourism-related jobs have specifically increased by more than one-third in the last 10 years and it was close to overtaking the manufacturing sector jobs in the country (Ludlow and Housego 2020) before the COVID-19 pandemic. Furthermore, a granulated scrutiny of the employment data on AFS (Table 5.2) reveals two interesting trends. The first is that most of the frontline hospitality related employment (for example, café, restaurants and takeaway food services) are part-time (or casual) in nature, with a greater female proportion. Secondly, women make up almost two-thirds of the workforce in the accommodation sector.

Labour Market Challenges

The Australian Tourism Labour Force Report: 2015–2020 (Deloitte Access Economics [DEA] 2015) highlighted that while the easing of the mining boom and general softening in the national labour market was assisting tourism enterprises to find workers, the country was facing a shortage of skilled and unskilled labour. The report stated that: 'in the absence of any change in policy or industry initiatives it is expected 123,000 new workers will need to be sourced by 2020. The skilled labour shortage is expected to be 30,000 workers, while an additional 63,000 unskilled workers are also required to be sourced' (p. i). Pre COVID-19 analysis suggested that cafés and restaurants as well as accommodation services providers were particularly facing greater labour market difficulties. For example, over 50,000 additional workers (inclusive of waiters, kitchenhands and chefs) in the food services sector and nearly 1000 additional managers were expected to be needed in the accommodation sector (SKILLSIQ 2019).

It has been posited that the productivity growth within tourism industries is crucial to Australia's transition from a resources-based economy to a services-based

Table 5.2 Employment in the AFS sector in Australia (in '000)

Sectors	Total	Part-time (%)	Full-time (%)	Male (%)	Female (%)
Cafes, restaurants & takeaway food services	181	117.70 (65.03%)	63.30 (34.97%)	86.20 (47.62%)	94.80 (52.38%)
Accommodation	86.1	41.50 (48.2%)	44.60 (51.80%)	30.80 (35.77%)	55.30 (64.23%)

Source: Australian Bureau of Statistics [ABS 2019)
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5249.02018-19?OpenDocument

economy, and that the growing shortage of skilled and semi-skilled labour is a threat to Australia's tourism strategy (TAA 2017: 5). Although there is documented evidence of discrepancies between governmental and recruiter evaluation of tourism industry related skilled migrant expertise (Treuren et al. 2019), Australia has a long history of demand-based skilled migration program in order to overcome specific shortages. As depicted in Table 5.3, the current skilled migration program addresses shortages in four of the main components of tourism industries namely: transport, accommodation, food, and promotion. These shortages have implications in the 4IR and tourism industry nexus, in particular the AFS sector and will be discussed later in the chapter.

Key Technologies

Various stakeholders of tourism industries are currently consumed with the ongoing disruptions associated with the COVID-19 pandemic (Cockburn 2020) as well as a diplomatic row with China (ABC 2020), the focus in this chapter is on the implications of the application of 4IR technologies for the AFS sector within tourism industries. As discussed throughout this book, the 4IR (also known as Industry 4.0) is disrupting almost all industries and sectors around the world with the use of transformative technologies to connect the physical world with the digital world. For example, OECD (2018a, b) has identified enabling technologies as one of the four megatrends that are likely to have significant impacts for the viability of various components within tourism industries (p. 61). According to the Australian Department of Industry, Science, Energy and Resources [DISER] 2019), these technologies include but are not limited to industrial and social robots, self-service kiosks, artificial intelligence [AI], chatbots, face recognition technology, voice controlled technologies, wearable and implanted technologies, 3D printing, the internet of things [IOT], and other automation technologies that are used for the production and delivery of goods and services instead of human employees. It is not surprising

Table 5.3 The AFS sector-related skilled migration occupation list

Component	Occupation
Accommodation	Accommodation and Hospitality Managers
	Hotel or Motel Manager
Food	Baker
	Cafe or Restaurant Manager
	Chef
	Cook
	Pastry-cook

Source: Department of Home Affairs 2020 https://immi.homeaffairs.gov.au/visas/working-in-australia/skill-occupation-list

that in recent years tourism enterprises have increasingly recognised that emerging technologies have the potential to foster their competitiveness by changing the way customers are targeted, disrupting existing service offerings, and forcing a re-imagining of the actual tourism experiences (TRA 2019: 2).

Tourism industries, however, are not only the enabler of, but are also shaped by, advances in technological innovations. Several key drivers such as, (a) increasing data volumes, computational power and connectivity, (b) emerging analytics and business-intelligence capabilities, (c) augmented and virtual reality systems are shaping new business models within tourism industries of the future (OECD 2016; OECD 2020). In addition, various components of tourism industries are increasingly embracing the 4IR and labelling themselves with expressions such as Tourism 4.0 or Smart Tourism (Lee et al. 2020; Pencarelli 2019). For example, as a part of the Smart Tourism initiative, the state of Queensland installed 150 *iBeacons* in 13 destinations including airports, information centres, national parks and other popular attractions which use location-based technology to automatically deliver users of the "This is Queensland" app with information about the top things to see and do in the vicinity (Tourism and Events Queensland 2015). The nature of the 4IR is such that it has accelerated the growth of tourism opportunities, transformed booking marketing operations, reinvented the business models of tourism enterprises, and enhanced immersive experiences in the AFS sectors around the world. For example, the Hen-na Hotel in Japan is Guinness-certified as the world's first robot-staffed hotel. Robots, equipped with the artificial intelligence and facial recognition technologies are used on the front desk, as customer information points and for storage purposes (Hen-na Hotel 2020). Fast-food outlets around the world have enthusiastically adopted the AI robots in recent years. For example, Oracle Food and Beverage (2017) reported that: a) KFC in China has showcased AI robots capable of complex customer service related tasks such as order changes and substitutions, and b) Dominos Pizza's delivery service in New Zealand has tested AI robots i.e. three-foot-tall carrier with storage space for up to 10 pizzas – that drives autonomously within a 20 kilometers range (p 3).

Although these examples indicate that the adoption of technologies have evolved at a rapid pace, the challenges as well as the opportunities for national governments, tourism-related enterprises and those employed within the sector remain poorly understood even amongst the world's most advanced economies (OECD 2016) including Australia. The 4IR and associated proliferation of transformative technologies identified earlier have not only excited cautious optimism about the future, but also fuelled an apprehension that large numbers of semi-skilled and unskilled jobs carried out by humans will be potentially replaced by machines (APEC 2017). For instance, the FAETHM (2020) report predicts that nearly half of all travel advisory jobs are automatable and almost 12,000 jobs are at risk in Australia (p. 20). It is in this context, this chapter

contends that it is imperative to explore the operating environment of tourism industries in Australia at the macro level, if the potential associated with the 4IR is to be harnessed and its pitfalls minimised.

Given that the 4IR readiness of tourism industries is dependent upon sound employment, education, and innovation policy infrastructure, this chapter examines the question: "what insights can be generated from the current state of tourism industries related 4IR initiatives in Australia?" As indicated earlier, the AFS sector is the main focus of the chapter. The Economist Intelligence Unit's (EIU's) (2018b) Automation Readiness Index [ARI], which compared twenty- five countries in terms of their preparedness for the era of automation, provides a useful framework to explore policy developments, discussions and directions that directly contribute to the country's preparedness and ability to harness 4IR. The ARI focuses on the three key areas: innovation policies that directly or indirectly support research into and business adoption of advanced technologies; education policies that aim to develop the human capital needed to take advantage of these technologies; and on labour market policies needed to manage the workforce's transition to a highly automated economy (EIU 2018b; 8). For the purposes of this chapter, drawing on Dhakal et al. (2020) and Dhakal and Tjokro (2020), 4IR readiness is understood as the degree to which policy infrastructure (macro level) is responsive to the changing external environment – global and regional trends in order to build tourism enterprises' (meso level) – and individual workers' (micro level) abilities to harness emerging transformative technologies within tourism industries in order to gain desired outputs. This chapter primarily concerns a macro level 4IR readiness in the context of AFS sector within tourism industries and adopts an exploratory approach making use of documentary analysis (Bowen 2009; Johnston 2017) of selected key reports in order to answer the research question.

While the primary merit of exploratory research is that it allows researchers to uncover meaning, develop understanding, and discover meaningful insights of the emerging issue or phenomenon, the main limitation of the approach is that the analysis is primarily qualitative and may suffer from researcher's bias (Brown et al. 2019). Moreover, as Tussyadiah (2020) observed, there are limited in-depth studies of the nexus between 4IR and components of tourism industries not only from the readiness perspectives but also from the standpoints of stakeholders involved in the production and consumption of tourism products and services. Future studies in the post COVID-19 research environment might use a multi-method approach to comprehensively examine the implications of 4IR beyond the AFS sector in Australia from multiple stakeholder's perspective. This chapter is also cognisant of the fact that while both the 2019 Bushfires and COVID-19 pandemic have affected the Australian tourism industries (Cockburn 2020), the analysis presented here does not take into account the full extent of adverse impacts associated with these disruptions on all tourism industries.

Employment Impacts

As Nankervis et al. (2019) observed, AI, automation, digital disruption and robotics are some of the elements associated with the phenomenon of the 4IR that have gained policy momentum across the Asia Pacific region. For instance, the Asia–Pacific Economic Cooperation [APEC] acknowledges that the magnitude and scale of the rapid transformations in digital trends should not be underestimated, and states that 'digital technology, innovation and entrepreneurship are key to securing quality economic growth and employment in the 4IR revolution which is upon us' (APEC 2017: 1). This is particularly noteworthy in terms of harnessing the potential associated with the 4IR, as Australia ranks tenth out of 25 nations (Singapore is the leader in the region ranked 3rd) on the Automation Readiness Index (EIU 2018a, b). Although discourse on the 4IR is still nascent in the region, high income countries like Singapore and even middle-income countries such as Malaysia have already developed national frameworks and begun to implement programs by exploiting digital opportunities (MITI 2018; SEDB 2017). For example, the Tourism Board of Singapore recently launched a digital platform with an aim to not only help tourism businesses build capabilities and succeed in the digital age but also to put them in a better position to recover from COVID-19. A component of the platform is the Tourism Transformation Index, a self-diagnostic tool that provides a holistic snapshot of the tourism enterprises' current status across six domains: leadership and organisation, process and operations, customer, innovation, technology and data (Sagar 2020). While Singapore is at the forefront of exploiting digital capabilities, Australia is yet to formulate a national policy or roadmap, and a recent KPMG (2020) report highlights the fact that compared to countries like China and USA that have been making strategic investment in 4IR related technologies, without an overarching national policy initiative, Australia is at risk of being left behind (p. 3).

Innovation Landscape

Cloutman (2020) indicates that the rate of technological change in tourism industries in Australia is moderate, and technological advancements have largely focused on increasing efficiency and improving traveller comfort. Although some components such as frontline services in the AFS sector are still associated with long working hours and low wages, the adoption of transformative technologies and automation has begun to permeate them. For example, Copper City Motel in the regional Queensland town of Mt. Isa has introduced a state- of-the-art keyless entry self-check-in system via automated kiosk that operates 24 h (Copper City Motel 2020). In addition, the Case 5.1 highlights holiday rentals providers in the state of Queensland that have embraced a fully automated online business model without any face-to-face contact with customers.

Case 5.1: Holiday Rentals Surfers Paradise

Increasing financial burden associated with labour as well as cut-throat sectoral competition means that a new genre of accommodation services providers – a fully online holiday rentals – have emerged in Australia. The Holiday Rentals Surfers Paradise [HRSP], formerly known as the Gold Coast Holiday Rentals [GCHR], was one of the pioneering specialist/boutique providers of holiday apartments that aims to cater to a high-end target market who seek to choose the precise holiday accommodation in which they will be staying. This small business operates under a fully automated online business model without any face-to-face contact with customers at the time of bookings, making payments for the services and during the stay i.e. checking and checking out. The HRSP was established in 2008 and employs three full time staff and had an annual turnover $3.3 million in 2013. It offers nearly 60 accommodation choices across 10 different locations in Southeast Queensland and focuses on providing customised and personalised service for travellers. Each of the accommodation options e.g. holiday homes and resort apartments are featured in an interactive website with a full set of details and photographs for better appreciation of amenities, floor plans and a virtual tour of the apartments. A fully online business model means that the HRSP has been able to maintain competitive advantage over offline competitors because of lower operating costs. The business has received multiple awards and recognitions from Airbnb, Booking.com, TripAdvisor.com, and Hotels.com. However, a trend of diminishing bookings and growing competition means that the HRSP is keen on identifying opportunities for growth and survival by focusing on repeat visitors. The study carried out by Dhakal et al. (2014) indicated that customers who were more likely to be repeat visitors were those who felt positively about the business after visiting its website, and whose expectations at the time of booking matched with the actual experiences without any face-to-face contacts whatsoever.

Sources: Dhakal et al. (2014), Holiday Rentals Surfers Paradise (2020).

The lack of availability of skilled baristas (as mentioned earlier) as well as their rising wages, at least partially have meant that innovation around automation and virtual reality (VR) are now considered a good business proposition. Fist, an Australian engineering firm Aabak has created a wholly automated robotic coffee maker. The robot barista named “Rocky” is equipped with a state-of-the-art fusion of hardware and software functions generally in the coffee making by observing every single step needed – from grinding the beans to tamping the coffee and putting the lid on the cup. Designed to function as a replacement of human baristas, Rocky can make a cup of coffee within 60–90 s (Aabak 2020). The Rocky has been installed by Melbourne’s “Once alike”, a coffee-automation start-up business that aims to specialise in autonomous preparation and seamless service of delivering

coffee through an app (Once Alike 2020). The main aim of the company is to reduce labour inputs but with greater output and better quality (Aabak 2020; Once Alike 2020). A business case for the synergy between Aabak and Once Alike is strong due the fact that one automated barista reduced wages to as much as $70,000 per annum per human Barista (Carey 2018) coupled with decreased costs of coffee sold per cup have enabled the café to reduce waste and offer competitive prices and speedy automated services (via app) to its customers. Second, a popular Melbourne restaurant Lûmé has adopted VR in order to augment the way the guests experience their meal. The innovative technology has allowed the restaurant to create a digital dining narrative showcasing the key ingredients, food preparation process and the restaurant into a VR experience with perceptible smell, sound and sensations (Catalyst VR 2020).

The IBISWorld report (2020) anticipates that various actors within AFS sector will enhance their digital presence and boost their technology capabilities over the next 5 years as technology transforms the way tourism services are provided and experienced. For example, accommodation services providers are likely to build up their social media presence and allow social media algorithms to influence marketing and promotional campaigns in order to target and engage with consumers (Appel et al. 2020). In addition, IBISworld (2020) also projects that AFS enterprises in regional Australia will increasingly adopt smart payment options for international tourists by offering contactless payment options, such as Visa payWave and Alipay. For example, one of the leading mobile payment and lifestyle platforms in the world – Alipay – recently partnered with Tourism Australia and piloted interactive mobile map services (operated through the Alipay app) in Sydney in order to promote tourist accommodations and food outlets to Chinese visitors (Tourism Australia 2019).

Education and Skills Landscapes

Trends associated with the 4IR combined with growth in international competition, workforce mobility, and growing customer demand and expectations for lived experiences have shifted educational and skills needs of the workforce. Tourism industries in Australia have collectively gone through a significant shift in terms of jobs growth and skills related challenges in the past two decades. For instance, two of the main challenges and opportunities associated with the AFS sector in the first decade of the new millennium revolved around the critical shortage of qualified and skilled labour, and the need for a comprehensive policy initiative to overcome the skills gap (Service Skills Australia 2013).

In recent years, challenges and opportunities have been framed around the implications of innovations in information and communication technologies (ICT) and associated digital disruptions, as well as digital transformative abilities on top of skills shortages. For instance, the Australian Government (2018a, b) report indicated that: '… advances in technology will provide opportunities for tourism businesses to

improve productivity and efficiency … the tourism industry must be equipped with appropriately skilled ICT and social media marketing prodigies … the development of artificial intelligence and virtual/augmented reality, data personalisation and privacy are necessities today …' (p. 4). This shift is not unexpected in the global and regional context of evolving 4IR – as it has been rightfully pointed out that transformative digital technologies have advanced at a fast pace and have been viewed as game-changers for a variety of sectors within tourism industries (OECD 2020). However, what is unexpected is the lack of national strategic workforce related policy discussions and preparedness specific to the tourism industries and 4IR nexus in Australia when compared to other OECD countries. For instance, the policy focus in destinations such as Switzerland that is significantly more costly than its competitors has been on ensuring the digital skills of the workforce as well as high quality network infrastructures in order to ensure differentiation and competitive advantage (OECD 2018b: 67).

It is worth noting that the non-governmental actors in Australia have been calling for and leading the upskilling the semi-skilled workforce with emphasis on digital competency and skills for the future. For example, an online community of tourism operators, industry and digital experts called the Tourism Tribe (2020) believes in allowing tourism enterprises to exploit cloud-based solutions to improve and speed up services. It has captured this need succinctly as: "… we need to innovate, learn from other industries, take the best and give it a crack in tourism. In order to find the workforce of the future, we need an upskilling model that works with the digital generation's lifestyle, needs and expectations. They move around, they are the social generation – driven to connect, contribute and create – and the training needs to reflect that" (Tourism Tribe 2020: paragraph 7). A recent significant development on the governmental side is the review and renewal of tourism related training courses albeit beyond the AFS sector. For example, SkillsIQ (n.d.) has undertaken a number of projects with an objective to update tourism, travel and hospitality training packages with an emphasis on digital competency. The case for updating certificate III, Diploma and Advanced Diploma courses on Event Management stated that: '… the adoption of technology in the Events industry is vital and presents opportunities to improve business processes and enhance customer experiences. The workforce needs to be equipped with the confidence and skills to embrace technology and to continue supporting employers to innovate in this space …' (p. 6).

These initiatives are particularly relevant in relation to the increasing adoption of technologies involving online engagement and automation. That means, as SkillsIQ (2019) rightfully noted, that workforce skills requirements for tourism industries will continue to evolve, and demand digital competency of the workforce in the AFS sector, as employees are already having to adapt to new devices to take orders and payments as well as deliver meals. For example, UberEATS is already utilising machine learning to help recommend 30 min delivery options, and popular choices near the location of customers based on order history including time of day and delivery location (Lee and Lin 2020). Businesses like UberEATS and their employees will be relying on more in-depth customer data to recognise consumer behaviour to refine their products and services.

Employment Landscape

In one of the landmark reports of this decade, Edmonds and Bradley (2015) indicated that the retail trade, transport, and the hospitality sectors have the highest level of automation susceptibility in Australia (p. 2). In this regard, the CSIRO-led 'Tomorrow's Digitally Enabled Workforce' Report (Hajkowicz et al. 2016) provides a significant basis for informing policy developments around the 4IR related digital disruptions and the future of jobs within tourism industries. Mainly because as IBISworld (2020) observed, while tourism industries have been affected by technological innovation, diverse disrupting elements have impacted different components and sectors differently. For example, traditional accommodation services providers have struggled due to the arrival of accommodation-sharing app such as Airbnb. On the one hand, Tourism Australia (2019) reported that while the number of businesses in the food services sector has skyrocketed in the past 5 years, the accommodation sector had the largest number of business closures in recent years. Figure 5.1 depicts the change in numbers of enterprises, and small businesses were the hardest hit with over 84% of total business closures. On the other, the overall contribution of Airbnb to the Australian GDP was estimated to be AU$ 1.6 billion with more than 14,000 jobs supported (see Deloitte Access Economics 2018a, b). In Western Australia's [WA], however, the stifling competition with potential business closures and job losses associated with Airbnb, as it accounted for a quarter of total room capacity, meant that the traditional accommodation sector ended up mounting a campaign against Airbnb (Bankwest 2018). A recent survey carried out by the Restaurant & Catering Australia (2019) revealed that more than 70% of businesses respondents believed that digital disruption linked to online food delivery had negative impacts in terms of profitability and viability. Hospitality industry. The other aspect of employment associated with rapid digital transformations that has been on

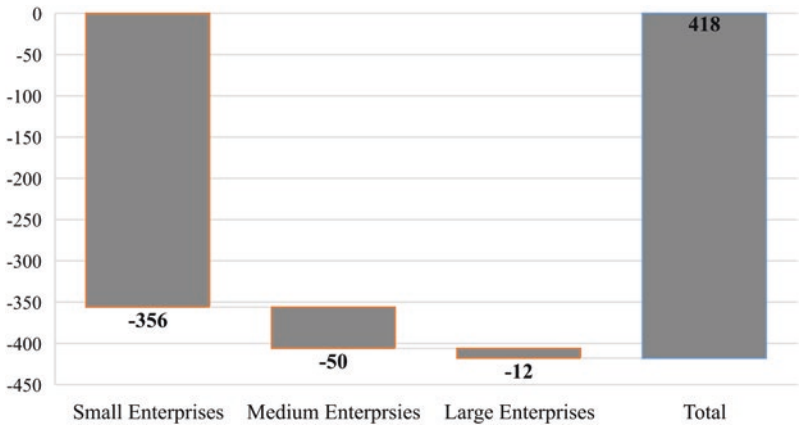

Fig. 5.1 Changes in number of businesses in the accommodation sector between June 2013 and June 2018. (Source: Graph created by the author based on the TRA (2019:1) data)

the spotlight in recent years is the precarious nature of the employment itself. For example, app delivery riders associated with UberEATS, Deliveroo, and Foodora in Australia are considered independent contractors and not employees (see Chau 2019) and it has been reported that these independent contractors get paid about $6 per hour (Zhou 2018) in a country where the current minimum wage is nearly $20.

Challenges & Opportunities

Although the outcomes of education, employment, and innovation related policy initiatives in the context of 4IR and tourism industries nexus cannot be expected instantaneously, policy discussions do need to capture their preparedness and implement an adaptive framework as a matter of urgency if the full potential of transformative technologies are to be realised. From the analysis above it is clear that tourism industries collectively are a significant driver of innovation and economic opportunities in Australia. However, the COVID-19 pandemic coupled with lacklustre 4IR readiness at the national level means that there is an urgent need to strategically address both issues simultaneously. It is in this context, COVID-19 and beyond as well as the 4IR as a way forward are briefly discussed below.

COVID-19 and Beyond

Australia remains one of the top ten popular destinations in the world (WEF 2019) and has been ranked one of the most advanced in the world in terms of competitiveness. For example, the TRA (2020) reported that over nine million international tourists visited the country in 2018–2019 and spent over AU$44 billion dollars. While visitors from China and New Zealand collectively made up almost one-third (30%) of the total tourists arriving in the country, it was the spending of Chinese tourists that accounted for over a quarter (27%) of overall expenditure (p. 5). The COVID-19 pandemic, coupled with the deteriorating diplomatic relations with China, (Tan 2020) means that the number of Chinese tourists visiting Australia is likely to take a nose dive in short and medium terms. For example, citing the Chinese Ministry of Culture and Tourism, the ABC (2020) reported: 'Due to the impact of the COVID-19 pandemic, racial discrimination and violence against Chinese and Asian people in Australia have seen a significant increase … the Ministry of Culture and Tourism reminds Chinese tourists to enhance their safety awareness and do not travel to Australia.'

Cloutman (2020) indicated that the revenue of tourism industries is expected to decline by at least 10% in 2019–20 due to a) the COVID-19 outbreak, and the associated strict travel restrictions which are significantly limiting tourism prospect, and b) severe bushfires earlier in 2019–20 discouraged both inbound and domestic tourism. Based on government modelling it was recently reported that tourism

industries will incur losses of up to $55 billion loss this year alone (Macmillan 2020). ABS (2020) reported that one third of AFS sector related jobs were lost due to disruptions caused by the COVID-19. For example, in the early days of the pandemic, Santonerous (2020) reported that Chinese restaurant owners in Sydney and Melbourne saw a 60% drop in sales on weekends and an 80% hit on weekdays as a result of the coronavirus. In addition, up to 20% of the total tourism workforce could vanish with the estimated reduction of nearly 130,000 jobs – mostly part-time, casual and contract/seasonal jobs/positions, resulting in lost salaries and wages into broader economy worth over AU$ 5 billion (TTF 2020). It can be expected that the future tourism industry- related strategies will focus on diversifying the market (Cranston 2020) on the other side of the pandemic. For example, a recent study indicates that the lack of overseas travel means that post COVID-19 domestic tourism is likely to get a boost as Australians are keen to travel regional destinations (see UQ News 2020).

4IR as a Way Forward

Although the level of AI and automation growth within tourism industries is inevitable, the impacts will vary according to the geographies and specific sectors. For example, Muro et al. (2019) reported that since the AFS sector in the United States has the highest potential for automation (p. 36). The analysis presented in this chapter revealed that the emphasis on digital approaches to transform tourism industries in Australia has so far been an ad hoc in nature rather than being a strategic imperative. It can be expected that the upcoming Tourism 2030 Strategy will have concrete and targeted emphasis on transformative technologies. For instance, the report on the Tourism 2030 consultation workshop (KJA 2019) stated: '…discussion on infrastructure honed in not only on transportation and connectivity of geographic areas, but also on technology. Digital connectivity was raised numerous times as a lever to drive more tourists to specific areas and to identify unique experiences…' (p. 35). However, the primary motivation of 4IR related macro level policy initiatives should be much more than just doing analogue tourism in digital ways. It should be guided by the desire to improve the quality of actual tourism practices and ensuring better socio-economic outcomes of both guests and hosts (Pencarelli 2019).

The Travel & Tourism Competitiveness Index, compiled by the WTTC, that measures enabling factors and policies of the travel and tourism sector contributing to the development and competitiveness (WEF 2019: xiii), ranked the country seventh out of 140 countries in the world. While it can be expected that domestic side of tourism industries is likely to bounce back immediately after COVID-19 due to international border closures, improved connectivity and technological innovations are likely to drastically transform tourism industries in the long run (OECD 2018a, b). In line with the WEF's (n.d.) Closing the Skills Gap Project which puts emphasis on the fact that higher education and vocational education systems need to be adaptive in order to meet the evolving demands of labour markets, the rational way

forward for ensuring 4IR readiness of Australian tourism industries would be to urgently develop national policies that focus on preparedness and ensures digitally competent employees and employers for the future.

Conclusion

This chapter focused on the AFS sector within tourism industries and examined the question: 'what insights can be generated from the current state of tourism industries related 4IR initiatives in Australia?' The chapter made broader analytical contributions towards evaluating the 4IR readiness of tourism industries in two fronts.

First, there are not only skills shortages but also gaps in the digital competencies of the tourism workforce in Australia. Unless efforts to invest in digital infrastructure in order to exploit the potential associated with the 4IR are tailored to meet the needs of tourism industries, rather than being made on the assumption that 'one size fits all', there is a risk that tourism businesses in Australia will not be able to maintain the competitive advantage. In addition, although it is likely the labour shortages within tourism industries is expected to be improved due to the decrease in demand caused by COVID-19, the reality has been that over two-thirds (69%) of employers within tourism industries have been reporting skills deficiencies in their workforce (SkillsIQ Limited 2019: 13). A strong case can therefore be made for the current occupation lists for migration program to be reassessed and calibrated in line with the skills and digital competencies of the future.

Second, although the impact of the current pandemic on the 4IR and tourism industries nexus is still evolving, one of the key findings is that while the awareness of the 4IR has certainly increased at the national level (KPMG 2020), a comprehensive and strategic readiness has been hindered by the lack of policy impetus when compared to other advanced economies in the region such as Singapore (SEDB 2017). An absence of national roadmap as well as regulations around the 4IR and tourism industries nexus highlight two specific issues. First, the fact that investments into 4IR are primarily driven by the private sector means that the policymakers are playing catch-up in relation to the development of associated transformative technologies such as automation and AI. Second, influential actors within tourism industries with expertise and influence on transformative technologies, in most cases are external to the country and connected to the global technological giants and multinational enterprises which are largely opposed to potential regulation.

It is clear that the AFS sector cannot remain competitive in the post COVID-19 era without significant investment in digital infrastructure and workforce competencies, and there is a danger that the lack of 4IR readiness will cost Australia's tourism industries.

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