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Adventure tourism innovation: Benefitting or hampering operations?

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ABSTRACT

Despite its recognised importance to tourism, very little is known about innovation and innovative practices within the sub-sectors of tourism, such as adventure tourism. Further, despite the known benefits of innovation, not all innovations are adopted and the ones that are do not always have a successful outcome. Through a qualitative case study of the US aerial adventure industry, this paper highlights the advantages and disadvantages innovation may have on operational risk management as well as understanding why seemingly critical innovations are not adopted. Unlike tourism in general, the industry is relying heavily on radical innovations as it continues to grow. Numerous benefits are highlighted, yet also indicate a resistance to adopt innovations. The study demonstrates how adventure tourism, in its adaption and managerial processes, seeks balance by using well-tested safety technologies and measures against the incentive to enhance such thrill effects that will appeal to customer.

Management implications:

- This paper documents the advantages and disadvantages of innovation within adventure tourism, in particular the US aerial adventure industry, and it demonstrates the managerial ambiguities.
- The paper finds that whilst innovations have had positive implications upon the industry, they have also led to further challenges in terms of changes in competitions.
- The adventure tourism industry seeks to balance its cycles of innovation, and safety is a contributing factor that stimulates innovative activity, alongside the concern for customer thrill experiences.

1. Introduction

Innovation is considered essential to the growth and long-term sustainability of organisations within and outside of tourism (Christensen, 2013; Divisekera & Nguyen, 2018; Freel, 2000; Zach, 2012) as organisations seek to gain a competitive advantage (Zach & Hill, 2017). This is particularly the case in notably competitive industries. In such industries, innovation is considered a critical coping mechanism to deal with intense competition as well as an efficient response to ever-changing demands, where tourists require an increasing variety and novelty of products and experiences (Divisekera & Nguyen, 2018; Klepper & Malerba, 2010; OECD, 2008; Roper & Tapinos, 2016). However, not all innovations are the response to changed customer demands. Some innovations are technology-driven rather than demand-driven, and can also be the results of regulatory forces, such as to increase health, safety and the compliance with environmental targets (Brooker & Joppe, 2014; Hjalager, 2015; Makkonen, Williams, Weidenfeld, & Kaisto, 2018). The focus of this paper is on product improvement and the creation of new products closely related to the operational field of tourism. Much of the literature available today on innovation in tourism lacks empirical research on operational matters, and what does exist is particularly limited in scope (Divisekera & Nguyen, 2018). Indeed, the literature on innovation in tourism has to a certain extent neglected the positive as well as negative consequences sometimes followed by introducing new products, particularly in regards to operational risk management. Innovation brings change and with change comes the unforeseen, the bane of risk management, potentially exposing the organisation to additional risks (Madrid-Guijarro et al., 2009; Hahn, 2012).

A qualitative case study of the US aerial adventure industry [AAI], an emerging type of visitor attraction, provides the setting for this paper. The focal point of this paper is centred on how innovations adopted by organisations may or may not improve participant safety. One particularly critical innovation provides the focus of this paper,

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namely the smart belays, perhaps the most influential innovation to occur within the US AAI. The traditional belay system, often referred to as lobster claws and consisting of two connectors to the belay cables, has participants fully responsible for the movement of their belay equipment, the equipment keeping them attached whilst on the course and therefore preventing them from falling. However, smart belays only allow for the movement of one connector at a time between belay cables (Sweeney, 2016). Whereas the lobster claws are openly prone to human error, the root cause of most failures and with often catastrophic consequences, the smart belays have largely removed this element, which is critical with an increasingly mainstream clientele for the industry (Slack, Chambers, & Johnston, 2010; Sweeney, 2016). Yet, an adventurous element is still maintained with participants still being engaged in the belay process (Oliver, 2018). However, not all stakeholders have adopted the smart belays, despite them appearing in the US around 2010 (Sweeney, 2016). Contributions to knowledge are created by casting a light on the positive *and* the negative sides of adopting technological innovations, and this paper casts a light on the real impacts of innovation.

This paper also furthers the discussion on visitor attractions, an under-researched field of study within tourism (Leask, 2016), as well as innovation within tourism sub-sectors, a recognised need within the literature, with a particular focus on commercial operations (Hjalager & Flagestad, 2012; Thomas & Wood, 2015). Bearing this in mind, this paper is guided by a number of research questions: Why do adventure tourism organisations introduce innovations? How do they collaborate with other stakeholders on safety and experiences? How can technology improve an entire industry? What innovative effects have smart belays had on the US AAI as a whole? Why do organisations hesitate to incorporate innovations? Answering these questions will not only provide a better insight into the effects of introducing new innovations to adventure tourism, but also further our understanding of tourism innovation in general.

2. Literature review

2.1. Aerial adventure parks

Aerial adventure parks are obstacle courses set between 10 and 60 ft in the air and is also known as a ropes course (Treego, 2014). An aerial adventure park consists of elements including, but not limited to, rope bridges, tight ropes, ladders, cargo nets and zip lines (Jiminy Peak, 2013). As with tourism in general (Czernek, 2013), most organisations within this industry are SMEs. As an activity it has become considerably popular among both non-profit and for-profit organisations, with an emphasis on providing educational, therapeutic and pay-to-play experiences (Wagstaff, 2015). Indeed, traditionally, education was its main purpose, with the pay-to-play experience having overtaken it since. In the US, as well as many other parts of the world, the AAI has today become a success story (Wagstaff, 2015). The industry has become one of the fastest growing adventure tourism sectors since its inception in 2008 (Hansen, Fyall, Spyriadis, Rogers, Brander-Brown, 2019). In a short space of time hundreds of parks have opened up and other tourist attractions, such as ski resorts, have diversified to accommodate the activity (Smith, 2015). Indeed, aerial adventure parks themselves have offered tourist destinations an opportunity to combat the issue of seasonality, with many ski-resorts having added these types of visitor attractions to their portfolio (Cummings, 2018). Thus, as a product in itself, the AAI represents a type of innovation to tourism. As is the case with many other adventure tourism activities, participants of aerial adventures demand thrilling experiences, delivering sensations of risk taking, but do not wish to face actual risks, leading to a paradox between safety and risk (Fletcher, 2010; Buckley, 2012; Pröbstl-Haider, Dabrowska, & Haider, 2016; Hansen, Rogers, Fyall, Spyriadis, Brander-Brown, 2019). As a result, the onus is on the industry to create an illusion of risk in which the participant feels they are taking a risk, but where possible, the actual risk has been diluted to such an extent it is a mere illusion (Pomfret and Bramwell, 2016; Hansen, Rogers, et al., 2019). This paradox does, however, make for a unique experience, enabling self-expression, personal growth as well as skill development for participants (Haegeli & Pröbstl-Haider, 2016). To satisfy the constant demands for improved participant experiences, the stakeholders within the industry have looked toward innovation, such as the smart belays, which have, in turn, had positive and negative impacts on operational risk management procedures. Interestingly, a majority of the smart belays available in the US AAI are of European design, such as Edelrid [German], Bornack [German] and CliC-iT [France] (Oliver, 2018).

2.2. Operational risk

Operational risk can be defined as the risk of negative impact on operations from an operational failure (Samad-Khan, 2008). As a result, the overall success of the organisation depends on reducing operational risks (Jallow, Majeed, Vergidis, Tiwari, & Roy, 2007). It is experienced by all types of organisations, regardless of the industry (Mitra, Karathanasopoulos, Sermpinis, Dunis, & Hood, 2015). Hahn (2012) argues that operational risk is caused by the uncertainty of future events in the normal course of business. In many respects having a well-developed operational risk management system in place can even lead to a competitive advantage (Jallow et al., 2007; Slack et al., 2010). Indeed, risk management has become an increasingly difficult prospect in operations management due to the numerous sources of it, such as suppliers going bankrupt, changes in demand as well changes to operations (Andersen, 2010; Slack et al., 2010). The aerial adventure park industry is particularly dynamic and with numerous personal protection equipment (PPE) products being developed constantly (Mettler, 2016) regular changes to operations are a given. This further leads to increased risks.

Slack et al. (2010) argues that successful operational risk management procedures involve four sets of activities: identification, prevention, mitigation and recovery. Once the effects of a potential failure have been determined, the organisation needs to attempt to prevent the failure from actually occurring. Slack et al. (2010) argues this is achieved through either redundancy or fail-safing. In this case, having a redundancy refers to having a back-up system or component in place in case of a failure. Fail-safing on the other hand is ingrained in operations to prevent unintentional human error, which is the root cause of most failures (Slack et al., 2010). The technological innovation taking place in the AAI has enabled operators to maintain the illusion of risk whilst reducing actual risk considerably (Sweeney, 2016). This is, for example, achieved through the aforementioned smart belays, which has removed some chances of human error occurring and thereby removed some of the uncertainty in that regard (Annas, 2016). Seemingly, technology-driven innovation plays a critical role in maintaining participant safety whilst also improving the experience.

2.3. Innovation

For a number of years, innovation has been recognised as a critical tool for competitiveness among tourism companies and destinations (Camisón & Monfort-Mir, 2012; Hjalager, 2002, 2015; Ottenbacher, 2007). Like Weidenfeld, Williams, and Butler (2010), this paper classifies innovations under two categories: incremental and radical innovations. Weidenfeld et al. (2010) argue that new products or processes adopted to improve existing processes and procedures are incremental innovations, whereas radical innovations are processes or products introduced. Roper and Tapinos (2016) argued the lifecycle of radical innovations tend to be of longer and more unpredictable nature than incremental innovations due to the uncertainty surrounding the adaptation and usage of a new product. Traditionally, tourism innovation has been incremental (Brooker & Joppe, 2014; Hjalager, 2015;

Makkonen et al., 2018). These include minor and major adaptations of products and services, involving slight differentiation, product line extension as well as changes to the cost/quality ratio of the product (Brackenbury, 2006; Weidenfeld et al., 2010). Further, innovation often occurs on a continuous basis in an effort to constantly satisfy the need of the consumer (Hjalager, 2010; Williams & Soutar, 2009). The need for continuous innovation has, for example, already been recognised in adventure tourism, a particular dynamic and competitive sub-sector of tourism (Williams and Soutar, 2009; Hansen, Fyall, et al., 2019). Tourism has traditionally been quick to adopt various types of innovations to improve customer service, to improve marketing practices and for product development among others (Hjalager, 2010; Camisón & Monfort-Mir, 2012). Fuglsang, Sundbo & Sørensen (2011) found that attractions in particular were more innovative than other tourism-related organisations.

Innovation is critical to the long-term sustainability of tourism operators and particularly SMEs (Divisekera & Nguyen, 2018; Ruhanen & Cooper, 2004), a relevant point, with adventure tourism having long been recognised as being dominated by SMEs (Page, Bentley, & Walker, 2005). Further, experts argue that by embracing innovation, small organisations increase their likelihood of survival (Cefis & Marsili, 2006; Ruhanen & Cooper, 2004). Further, innovation is recognised as providing organisations with a source of competitive advantage (Molina-Morales & Mas-Verdu, 2008; Hjalager, 2015). Indeed, Freel (2000) argued that innovation is essential for competitiveness to satisfy demand of an ever—changing consumer. This is particularly the case in adventure tourism, where participants are likely to pursue different and more challenging experiences each time (Williams & Soutar, 2009). As such, demand and competition often encourages innovation in new industries (Klepper & Malerba, 2010; Roper & Tapinos, 2016).

Yet, why do some organisations fail to adopt certain innovations? Tourism, in general, has been quick to adopt new innovations, for example, with most occurring through collaboration or through external inspiration (Hjalager, 2015; Sevrani & Elmazi, 2008). Indeed, Rønningen (2010) argued that the adoption of innovative ideas and products is much reliant on a trickle-down effect from suppliers of technology and materials, rather than being self-invented. However, innovations are typically expensive and this, perhaps, offer an explanation as to why it is mainly larger organisations within tourism who are more likely to innovate (Soames, Brunker, & Talgaswatta, 2011). Indeed, despite having been acknowledged as the lifeblood of the tourism industry, SMEs are also considered to be laggards preventing innovation and growth (Thomas, Shaw, & Page, 2011). As such, it is perhaps not surprising that the tourism industry is more defined by the barriers and challenges than accelerators to innovation (Hjalager, 2002; Weidenfeld et al., 2010). These barriers and challenges are particularly due to the fragmented state of the industry, lack of resources and trust, poor learning environments, the absorptive capacity of the industry and low levels of education and training (Hjalager, 2002, 2015). In fact, existing organisations struggle to absorb new ideas, meaning innovative ideas are having to rely on entrepreneurship and recently formed organisations instead to be adopted (Hall & Williams, 2008; Rønningen, 2010). Further, Borgelt and Falk (2007) also found that an emphasis on operational risk management will stifle innovation. In turn, the spread of innovations within a market, also known as diffusion of innovations, are hampered.

Rogers (2003) argued that the characteristics of an innovation determine its rate of adoption within a social system. These characteristics are: relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003). Relative advantage refers to the extent a particular innovation is considered better than the idea it precedes. Compatibility refers to the extent an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters. Complexity refers to the extent to which an innovation is perceived as difficult to understand or use. Trialability is the degree to which an innovation might be experimented with. Finally, observability refers to the extent of which results of the innovation are visible to others (Rogers, 2003). Rogers (2003) further argued that innovations considered to have greater relative advantage, compatibility, trialability and observability and less complexity are more likely to experience fast adaptation rates among organisations. Preventative innovations, innovations preventing future unwanted consequences may, however, have a low relative advantage due to the benefits often being delayed in time, somewhat intangible and the unwanted consequence may not occur at all as a result of the innovation (Rogers, 1995). As such, with relative advantage being key to the rate of adoption of innovations, it is perhaps not surprising that preventative innovations lags in adoption rate.

As stated in this literature review, the innovation processes in tourism enterprise are complex, and stimuli come from many sources. This study focuses on specific safety operational measures and technologies, assuming that the adaption of such technologies and measure and further innovative endeavour can lead to either positive or negative developments, depending on the specific operational and managerial style and culture.

3. Methodology

This article was guided by a qualitative research method and analysis, having been deemed the most appropriate approach to achieve the aim. Qualitative research starts with assumptions, a world-view, potentially using a theoretical lens and studying research problems exploring the meaning individuals or groups impute to a certain problem (Creswell, 2007). Further, a single-case study approach was chosen, with a focus on the US AAI and its key stakeholders. This allowed the paper to deeply explore the current levels of innovation within the industry. Case study research is the study of a problem setting explored through single or multiple cases (Creswell, 2007). Eisenhardt and Graebner (2007) argue that such an approach is relevant to research projects seeking to gain a deep understanding of the issue being researched. Yin (2009) further argues that case study research is one of the best methods to describe real-life as the researcher is able to appreciate the richness of participants describing their experiences in a certain context. Therefore, such a strategy goes hand-in-hand with the chosen approach of this paper, particularly bearing in mind the importance of the quality of the data gathering. Real-life recounts were indeed key in the effort to discovering the influence of innovation within the AAI.

3.1. Sampling

The sampling was guided by Mitchell et al.'s (1997) theory of stakeholder identification and salience. A combination of convenience sampling, snowball sampling and purposeful sampling techniques were employed. Builders, operators, insurance providers, engineers, potential/actual regulators and standard writers were interviewed for this study. Senior managers from the respective organisations were approached to participate due to their knowledge and influence in regards to risk management procedures and industry collaboration. The states with the most aerial adventure parks were given priority in the hope that they would have more experience and understanding of collaborating with the industry. States represented by the interview participants included Florida, Colorado, North Carolina and Oklahoma. Further, some operations were SMEs, whereas others were part of larger resorts. However, one stakeholder group, the consumer, was left out. Whilst this study does recognise their legitimacy, it was deemed they lack the required knowledge, experience and expertise on a complex matter, such as innovation. Instead, a more knowledgeable stakeholder was deemed more apt, the state. Bearing in mind the objective of the state is to uphold public safety in this case, their participation and representation of the consumer was deemed appropriate. In total, twenty interviews took place. The data gathering was concluded upon reaching data

saturation.

3.2. Data analysis

Accurate data analysis was key to the overall study, with the following interpretations developed as the authors made sense of the data at hand as well as the lessons learned throughout the study (Lincoln & Guba, 1985). Creswell (2007) argued that these interpretations may be based on hunches, insight or intuition formed via the larger meanings gathered from the data. As the case study focussed on an industry, but gathered data through speaking to various stakeholders within it, an embedded analysis was employed. This allowed the case study to focus on the industry as a whole, whilst not forgetting the "sub-units", or stakeholders, that ultimately make up the industry (Yin, 2014).

3.3. Thematic analysis

Thematic analysis was used to carry out the analysis the data to assist in this. According to Boyatzis (1998), thematic analysis is 'a way of seeing'. Qualitative research is particularly diverse and thematic analysis provides the foundations to qualitative analysis (Braun & Clarke, 2006). Using this approach, researchers are able to see what others might not as patterns or themes are discovered within the data collected (Boyatzis, 1998). Thematic analysis increases the accuracy and sensitivity of the researcher's understanding and interpretation of the data collected. Creswell (2003) points out that the themes showcase numerous perspectives from participants that can further be supported by the literature. For example, the themes developed for this paper were supported by segments from the interviews (Creswell, 2007). The thematic analysis process involved three stages: deciding on sampling and design issues, developing themes and a code and finally validating and using the code (Boyatzis, 1998). Creswell (2003) further argues that this approach is ideal for designing useful descriptions for case studies. For this paper, an abductive approach was chosen as this involved developing thematic codes from the literature as well as the data collected. Given the interview guides were guided by the literature, it was inevitable that themes in the data collected would also reflect the literature. The subsequent name for the code should relate to the purpose of the research (Saunders, Lewis, & Thornhill, 2012). Bearing this in mind, one code was devised, namely innovation. Two themes were subsequently identified.

3.4. Results of the analysis

The study led to the identification of two distinctive themes: "Innovation as a blessing" and "The curse of innovation". Accordingly, the study demonstrates the paradoxes, and provide an insight into the stakeholders' perception and their explanations of they choose to address the challenges in their operational practice.

3.4.1. Theme one: innovation as a blessing?

During the process of gathering data it became clear that innovation presents opportunities and challenges in regards to improving operational risk management procedures. For example, technological advances in areas such as belay systems have improved risk management procedures by providing, essentially, a safer experience for the customer. These newer products are called Smart Belays. These were often the first reference point during interviews when discussing innovation and risk management and have seemingly been critical to the point that discounts on insurance premiums were offered to those who used smart belays in their operations, as pointed out by participant 15, an insurance agent within the industry. Indeed, several discussions left the interviewer with the impression of a very dynamic industry, ripe with innovation. Participant 7, the director of a leading standard-writing organisation within the industry, described the industry as:

> *"[…] a very dynamic industry that seems to be evolving and changing the technology […] It's a rapidly changing environment".*

According to participant 1, the general manager of an operator, this description is indeed the case:

> *"[…] equipment has changed so much and it's rapidly changing now. […] it's evolved to you have auto-locking lanyards. […] and there's continuous belay systems, so there's never a transfer".*

Nevertheless, the industry is experiencing a constant demand for "bigger, faster, longer and higher" experiences, meaning stakeholders are finding that they're constantly having to improve. Participant 8, a senior manager of an engineering company, developed a tool that has enabled the company to design ziplines more efficiently. However, the participant also commented:

> *"[…] every time somebody comes to us for something bigger and faster we find some component of the calculator that we built, that now needs to be upgraded".*

Further, participant 17, the COO of a major operator, mentioned that:

> *"[…] there's also advances in the industry in terms of the equipment that our clientele are using that we provide our participants. I can think of a few different devices that are called smart belay".*

Participant 15 commented in a similar vein, when asked how innovation has affected risk management within the industry, whilst also referring to the smart belays:

> *"In a positive way […] what I'm referring to there is the technology in the smart belay systems. […] that is definitely innovation […] innovation has made the industry safer".*

Indeed, according to participant 16, the CEO of a major operator, the industry has undergone major changes, through innovation, during the past few years, including specially designed tracks:

> *"[…] when I was first doing ropes courses, we were using two carabiners, […] Now, with our courses, we put the harness on, we put them on the track […] back in the day, some manufacturers used to tie their harnesses out of webbing".*

Similarly, participant 12, the general manager of a major operator, also commented on the effect of innovation on equipment in a quest to make the activity safer:

> *"It [equipment] does constantly change. It changes in ways that can simplify the job of our park monitors, […] changes are put in effect to minimize risk or to reduce risk".*

Participant 9, operations and risk manager of an operator, commented on how their collaborative efforts have led to innovations:

> *"We try to work closely with manufacturers […] I would say that a huge number of technical innovations have come out from our collaborations with vendors".*

Similarly, participant 4, director of training and operations of a national builder, collaborated with other manufacturers to use equipment in new innovative ways:

> *"We collaborate with them, because they built the helmet or the harness or the trolley or the rescue system and we want to use it in this unique way".*

Seemingly, innovation has made the industry safer, reducing risk particularly through the smart belays. Essentially, it appears the smart belays have taken a major focus off the shoulders of operators, allowing staff to focus more on the overall operations. The introduction of this equipment has also removed some of the risk of human error as participants are no longer able to unhook themselves on the courses, an issue

that has caused incidents in the past as mentioned in the literature review. Yet, innovations do not simply improve risk management aspects of the operations, but also enables the industry to continuously feed the demand for "bigger, faster, longer and higher". When queried about the innovation taking place in the industry participant 1, for example, commented that:

"[…] that really is adding to the uniqueness of the industry. So, if something new is coming out, they [the organisation] can have a really unique and really awesome attraction".

Similarly, participant 16 described how their company is constantly adding new elements to their experiences to feed demand:

"[…] we're always under the gun to develop new elements. We developed 25 new ones last year, we've got 25 new ones this year, coming out".

As such, innovation is improving the industry. However, innovations, such as the smart belays, also come at a financial cost and not all are willing to make this investment just yet. For example, participant 11, the owner of an operator, argued that:

"[…] I think that if the aerial adventure course becomes too technical and too expensive, a family will just opt out and just go and do something else".

That type of mind-set is a concern to others within the industry. Whilst innovative products that improve risk management procedures may be available, it's of little help if people aren't buying into them. Participant 1 pointed out:

"[…] there's still a bunch of courses who aren't making that investment in […] this smart belay technology […] are significantly more expensive than just that traditional lobster claw […] I see that as really a danger to the entire industry".

3.4.2. Theme two: the curse of innovation

However, innovation also brings its challenges. Innovation brings change and with change comes the unforeseen, the unknown, which is one of the challenges to operational risk management. Given the constant growth of the industry, stakeholders are doing their best to differentiate themselves from their competitors and they look toward innovative products and ways of operating to achieve this competitive advantage. Whilst this is undoubtedly an attempt to maintain individual short-term sustainability, it would appear that it also presents the industry, as a whole, with long-term concerns over how to continuously achieve effective operational risk management, with innovation struggling to keep up with the growth of the industry. For example, to differentiate themselves, stakeholders are demanding "bigger and better, faster and crazier!" according to participant 8, who described some of the challenges of achieving effective operational risk management:

"Some of the key challenges we face are when [demand] takes you to the edge of the engineering realm".

Similarly, participant 4 pointed out that:

"[…] building these bigger, faster, more fun systems, also requires you to somehow then manage those risks and that's a challenge when the industry is growing faster, sometimes, than the technology".

Participant 15 spoke of the constant changes taking place in the industry to create bigger and faster experiences, relying on innovative new approaches to achieve this. As such, innovation is also presenting the industry with challenges:

"I think the key challenges that the industry faces is the evolution of the industry and the development of the industry. […] that brings new unknown risks".

Participant 15 further explained the challenges of innovation and the ensuing change it brings when embraced:

"[…] any time you're having to learn a new procedure, there is a learning curve there".

Participant 5, a site and course designer of a builder, further summed up the challenges that innovation and new technology can bring:

"[…] as soon as you create technology, somebody finds a way around it or it creates another issue in the industry".

On the other hand, participant 10, a state regulator, commented on the challenges of regulating an industry undergoing constant innovation and how their relationship with the industry was critical in doing so effectively:

"[…] that [constant innovation] is a challenge, just being able to make sure that we're appropriately regulating the new device as they come on the market".

Participant 3, an operator and builder, provided an example of how innovation can impact a visitor attraction when it goes wrong, referring to a case where a major manufacturer had introduced a new trolley, the piece of equipment that carries participants on ziplines, the new trolley resulting in increased failure rates:

"[…] what they did was they created a Track Plus […] we had 80% failure that year on our trolleys […] It just wasn't plugged to handling the speed that it had always originally handled".

Another case, described by participant 18, a state regulator, showed how the good intentions of innovation can have dire consequences:

"They said [the manufacturer], "well, we have ziplines and you have to disconnect, we have to have a patron or an operator up there to monitor the disconnect, so why don't we put them on a rail-system that acts like a zipline?" […] this one gentleman […] when he pulled back, the puck assembly twisted and turned and came out the bottom, so he went off the back. […] now they've redesigned it and we finally opened it".

Similarly, participant 19, the owner of an operator, argued how innovation is also providing changes and challenges to the industry:

"Sometimes [innovation] has caused accidents. […] it [the demand for bigger, faster, longer] causes people to use products in a way that they weren't intended to be used and hope that they work".

On the other hand, participant 11 simply did not see the benefit in adopting a new innovation, such as the smart-belay, seemingly of the impression that there were more drawbacks to it than benefits:

"I think it [smart belay] changes the experience that our guests will have. […] one, it's very expensive and two, I think it will fundamentally change the experience. Take away some of that perceived risk".

Participant 15 made a similar point:

"[…] now with the increase in innovation and technology, it's not so much built off human interaction, because you've got the smart belays".

As such, innovation brings both solutions and challenges to the AAI. Nevertheless, it would seem that the invention of the smart belay has had a largely positive impact on the activity, though it has simultaneously presented the industry with dire warnings of how matters can go wrong as well as created a bottle-neck or two. It also appeared not everyone were able to take advantage of new innovative products due to their costs, though the costs in some cases could be off-set against savings elsewhere such as insurance. Perhaps somewhat ironically, the issues caused by innovation seemed to have been solved through further innovation. Indeed, innovation also appeared to present the industry with new unknown risks, thereby creating a never-ending cycle of need for innovation. However, with demand growing at a rapid pace, the industry seemed to struggle to keep up and perhaps seeking quick

solutions as a result. Unfortunately, this in turn has caused issues as products, at times, have been used in ways they were not intended originally. Overall, though, according the data gathered, the activity is safer with the smart belays than without it, though not everyone seems to be in agreement.

4. Discussion

This paper has illustrated a particularly fast growing and dynamic AAI constantly looking towards innovative products and approaches to improve the activity by making it safer and more exciting undoubtedly to improve long-term sustainability. As with adventure tourism, this need for continuous innovation to satisfy increasingly changing consumer demands has been recognised within the literature, knowing that without it the industry would become saturated (Mei, Arcodia, & Ruhanen, 2012; Williams & Soutar, 2009). Interestingly, unlike tourism in general (Makkonen et al., 2018), these innovative products are often created purely for the AAI, such as the smart belay (Oliver, 2018). As such, innovation within the AAI is largely technology-driven, and even so in radical ways. Seemingly, organisations within the industry are developing innovative products to improve the experience as well as safety, with the diffusion of innovations spreading throughout the industry via suppliers as a trickle-down effect, much like the argument put forth by Rønningen (2010). Seemingly, smart belays have largely improved safety measures within the US AAI. At the same time, incremental innovation is also occurring, with the industry using existing equipment from other industries, yet in slightly different ways. The level of innovation is perhaps due to the unique nature of the activity as well as the infancy of the industry overall. Rønningen (2010), for example, argued that new enterprises were more innovative than existing ones.

The data seemed to indicate that the aforementioned appetite for more thrills, faster ziplines and bigger parks has led to a continuous cycle of innovation within the industry, as well as a continuous learning curve, as depicted in Fig. 1. One participant, for example, described how they are under pressure to develop dozens of elements each year to keep prospective and current clients interested. The literature supports these notions arguing that demand and competition often encourages innovation in new industries (Hjalager, 2002; Klepper & Malerba, 2010; Roper & Tapinos, 2016). Further, Freel (2000) argued that innovation is essential for competitiveness as well as to satisfy demand of an ever—changing consumer. Indeed, experts argue that by embracing innovation, small organisations increase their likelihood of survival (Cefis & Marsili, 2006; Ruhanen & Cooper, 2004). However, such innovations also come at a financial cost, meaning some have yet to invest in them, a common issue within the larger tourism literature as well (Divisekera & Nguyen, 2018; Thomas et al., 2011). The data, for example, indicated some SMEs were yet to adopt some innovations, whereas the larger organisations taking part in this paper seemed at the forefront of innovation within the industry. Putting Rogers' (2003) explanation for the rate of adoption of innovations within a social system into the context of this paper, it would seem the individual actors disagree on the need for the adoption of a preventative innovation, such as smart belays. Clearly, some participants argued that smart belays were a better and safer option (relative advantage and observability) to the previous choice of lobster claws, whereas others thought the expense associated with the product made it unaffordable and noted there was little evidence of them being a safer alternative (observability), meaning there was little advantage to adopting it. Similarly, an argument was also made in regards to smart belays removing part of the human interaction and perceived risk (compatibility) and thus perhaps changing the experience and the values thereof. Nevertheless, in light of the disagreement, with smart belays representing a radical innovation, their innovative life cycle is seemingly longer and more unpredictable, as argued by Roper and Tapinos (2016). This was also noted in the data. Further, the literature also acknowledges that some innovations may experience considerable delays in being adopted (Hjalager, 2015). Evidently, some organisations simply do not possess the required absorptive capacity to adopt innovations.

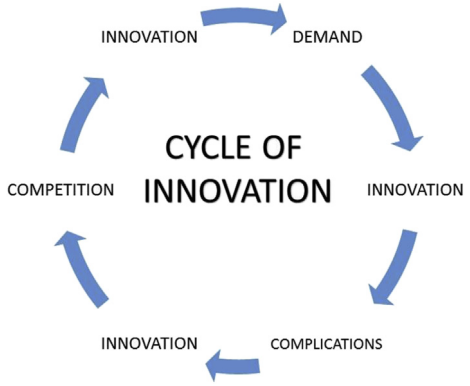

Fig. 1. Cycle of innovation.

Whilst innovation has brought solutions to certain challenges within the industry, it has also created new challenges as stakeholders attempt to fit them into their existing operations. Innovation brings change and with change comes the unforeseen, the bane of operational risk management, potentially exposing organisations to additional risks (Madrid-Guijarro et al., 2009; Hahn, 2012). The constant demand for bigger, faster and longer is pushing innovation-levels within the industry, yet ironically, also pushing some stakeholders to use products in a way they were never intended to. Further, according to the data, accidents have happened due to innovation, though the issues caused by innovation appear to have been solved through further innovation. Nevertheless, the data indicate significant changes to operations and therefore resulting in some bottle-necks, such as new innovative equipment being introduced, yet operating poorer than the equipment it was meant to replace. One participant, for example, argued that someone will always find a way around new technology or said technology will create new challenges. Somewhat paradoxically, innovation is seemingly required to improve operational risk management procedures, yet innovation also creates a need for improved operational risk management procedures within the industry. One could argue that, to a certain extent, the industry is a victim of its own success. Yet, the data appeared to depict innovation with an overall positive impact, depicting an industry undergoing constant change as it seeks to continuously improve and remain competitive, which in turn will enhance its long-term sustainability (Roper & Tapinos, 2016; Ruhanen & Cooper, 2004). Indeed, the arguments put forth by the interview participants posit the relationship between operational risk management and innovation in a vastly different light to Borgelt and Falk (2007), for example, who argued that emphasis on risk management will stifle innovation. In the case of the AAI, risk management and competition appear to have put innovation into the fast-lane, as the industry continuously seek to improve. As such, the mind-set that innovation cannot take place without taking risks (Wince-Smith, 2005) seems applicable within the AAI with stakeholders, particularly builders and operators, utilising incremental and radical innovations in an attempt to provide safer and better visitor attractions.

5. Conclusion, limitations and future research

Much of the literature on innovation within the tourism industry lacks empirical research. This paper has furthered our understanding of innovation within tourism, adventure tourism, a sub-sector of tourism, as well as our understanding of visitor attractions in general. This paper has revealed an AAI growing at a considerable pace with continuous innovation taking place to improve the participant experience and

safety. Unlike tourism in general, the type of innovation taking place in the AAI is largely radical, which is perhaps due to the unique nature of the activity and its infancy. Having undergone, and continuing to do so, incredible growth and change in a short space of time, industry stakeholders are under pressure to continuously deliver ever-changing and improving experiences to provide more thrills, faster zip lines and bigger parks in an effort to remain competitive, as is also the case with adventure tourism in general. Yet, safety is still paramount. As a result, the industry is looking toward innovation to solve this enigma. The smart belays have, arguably, been the most critical innovation to the AAI, though not all stakeholders have adopted this innovation yet. The smart belays have, seemingly, simplified the operations of aerial adventure parks and improved participant safety. Yet, some stakeholders simply refused to adopt innovations due to a perceived lack of benefits from doing so, be it the financial burden or for fear of the activity losing some remaining authenticity by radically changing the participant experience in a negative way. This is, perhaps, somewhat ironic, if the smart belays are indeed safer than the traditional lobster claws, as argued by most of the interview participants. It does, however, beg the question as to whether the government needs to enforce this adoption.

Whilst innovation has improved safety measures it has also introduced new challenges to operational risk management through the introduction of radical innovations or using old products in new innovative ways, thus creating a never-ending circle in the pursuit of perfection. As such, whilst innovation is clearly required to remain sustainable, it is simultaneously testing the industry's level of sustainability going forward, thus seemingly being a by-product of innovation. Innovation is a critical element of improving operational risk management procedures, and improving the participant experience in general to ensure return visits, yet also creates a need for further improved risk management procedures, thus presenting a paradox within the AAI. This study shows that the collaboration with technology suppliers is critical for innovation, but that collaboration and early adaptation may also come at a price. The reluctance to step up technological to systems of greater advancement is understandable, but in an innovation as well as safety perspective critical. Such double and contradictory implications for managerial behaviours are important to have in mind in innovation studies in tourism.

As with any other research, this paper naturally has its limitations. This is but a brief exploration into the US AAI and how it copes with innovation. Further research adventure tourism innovation is needed, especially with a focus on innovation at a micro level. Employing Rogers' (2003) diffusion of innovations model within tourism in general to explore how innovations are diffused would also be very beneficial. More research, particularly longitudinal, is also warranted to further explore the AAI's relationship with innovation. Indeed, the industry's paradoxical relationship with innovation ought to be tested in other sub-sectors of tourism.

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