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(Full Paper)

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ABSTRACT

Smart tourism destination as: an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life. Lopez de Avila (2015). Smart tourism involves multiple components and layers of "smart" include (1) Smart Destinations which was special cases of smart cities integration of ICT's into physical infrastructure, (2) Smart experience which specifically focus on technology-mediated tourism experience and their engagement through personalization, context-awareness and real-time monitoring, (3) Smart business refer to the complex business ecosystem that creates and supports the exchange of touristic resource and the co-creation of tourism experience. Gretzel et al, (2015). Smart tourism also clearly relies on the ability to not only collect enormous of data but to intelligently store, process, combine, analyze and use big data to inform business innovation, operations and services by artificial intelligence and big data technique. The rapid development of information communication technology (ICT) such as artificial intelligent, cloud computing, mobile device, big data mining and social media cause computing, storage and communication relevant software and hardware popular. Facebook, Amazon, Apple, Microsoft and Google have risen rapidly since 2000. In recent years, Emerging technologies such as Artificial Intelligence, Internet of Thing, Robotic, Cyber Security, 3D printer and Block chain also accelerate the development of industry toward digital transformation trend such as Fintech, e-commerce, smart cities, smart tourism, smart healthcare, smart manufacturing... This study proposes a conceptual framework that integrates (1) artificial intelligence/machine learning, (2) institution/organizational and (3) business processes to assist smart tourism stake holder to leverage artificial intelligence to integrate cross-departmental business and streamline key performance metrics to build a business-level IT Strategy. Artificial intelligence as long as the function includes (1) Cognitive engagement to (voice/pattern recognition function) (2) Cognitive process automation (Robotic Process Automation) (3) Cognitive insight (forecast, recommendation).

Keywords: Smart tourism, smart cities, artificial intelligence, digital transformation and big data

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INTRODUCTION

According to United Nations World Tourism Organization (UNWTO: Tourism Highlights 2017 Edition) report released, the total world tourism revenue in 2017 was $1.34 trillion US dollars, an increase of about $94 billion US dollars from 2016. In 2017, the total number of international tourists reached 1.323 billion up 7% from the previous year. The forecast average annual growth rate of global international visitors will be about 3.3% between 2010 and 2030. In 2020, it will reach 1.4 billion, and in 2030 it will reach 1.8 billion. In terms of regional market development, the Asia-Pacific region is still the region with the strongest growth. The average growth rate in the Asia-Pacific region is 4.9%, which will increase from 204 million in 2010 to 535million in 2030. Estimated to grow from 21.7% in 2010 to 29.6% in 2030.

In recent years, countries around the world have prioritized tourism as a key economic sector to help the country's overall economic development. "Sustainable Tourism" is now the top priority for all countries to develop tourism. The Asia-Pacific Economic Cooperation (APEC) meeting in this year (2018) under the leadership of the host economy Papua New Guinea, pays more attention to "smart tourism" One of the key points: the use of digital technology for digital connections will help to develop inclusive tourism and promote the connection of people in the Asia-Pacific region to promote sustainable tourism. In this regard, Every Country has formulated specific strategies and actively promoted it.

Smart tourism involves multiple components and layers of "smart" include (1) Smart Destinations which was special cases of smart cities integration of ICT's into physical infrastructure, (2) Smart experience which specifically focus on technology-mediated tourism experience and their engagement through personalization, context-awareness and real-time monitoring, (3) Smart business refer to the complex business ecosystem that creates and supports the exchange of touristic resource and the co-creation of tourism experience. Gretzel et al, (2015). Smart tourism also clearly relies on the ability to not only collect enormous of data but to intelligently store, process, combine, analyze and use big data to inform business innovation, operations and services by artificial intelligence and big data technique.

The rapid development of information communication technology (ICT) such as cloud computing, mobile device, big data mining and social media cause computing, storage and communication relevant software and hardware popular. Facebook, Amazon, Apple, Microsoft and Google have risen rapidly since 2000. In recent years, Emerging technologies such as Artificial Intelligence, Internet of Thing, Robotic, Cyber Security, 3D printer and Block chain also accelerate the development of industry toward digital transformation trend such as Fintech, e-commerce, smart cities, smart tourism, smart healthcare, smart manufacturing.

This study proposes a conceptual framework that integrates (1) artificial intelligence/machine learning, (2) institution/organizational, and (3) business processes to assist smart tourism stake holder to leverage artificial intelligence to integrate cross-departmental business and streamline key performance metrics to build a business-level IT Strategy. Artificial intelligence as long as the function includes (1) Cognitive engagement to (voice/pattern recognition function), (2) Cognitive process automation (Robotic Process Automation), and (3) Cognitive insight (forecast, recommendation).

LECTURE REVIEW

Smart Tourism

Lopez de Avila (2015, n.p.) defines the smart tourism destination as: an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life. Gretzel *et al.* (2015) Define smart tourism as "tourism supported by integrated efforts at a destination to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into on-site experiences and business value-propositions with a clear focus on efficiency, sustainability and experience enrichment."

According to Gretzel *et al.* (2015) define smart tourism components and layer as Figure 1. Smart tourism involves multiple components and layers of "smart" include (1) Smart Destinations which was special cases of smart cities integration of ICT's into physical infrastructure, (2) Smart experience which specifically focus on technology-mediated tourism experience and their engagement through personalization, context-awareness and real-time monitoring, (3) Smart business refer to the complex business ecosystem that creates and supports the exchange of touristic resource and the co-creation of tourism experience. Gretzel et al, (2015).
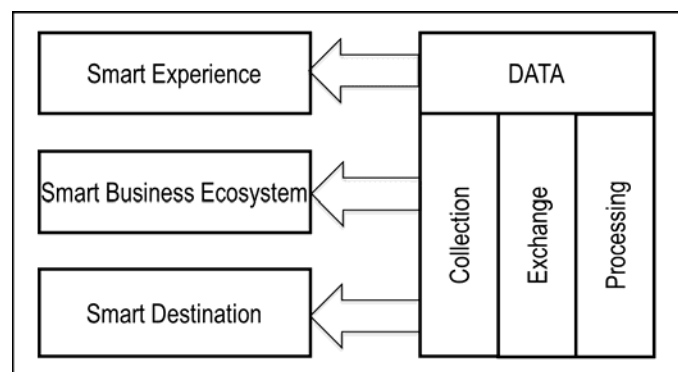
Source: Gretzel U, Sigala M, Xiang Z, Koo C (2015)
Figure 1. Components and layers of smart tourism

Smart Destination

Smart destination are special cases of smart cities: they apply smart city principles to urban or rural areas and not only consider residents but also tourists in their efforts to support mobility, resource availability and allocation, sustainability and quality of life/visits. Destinations are typically the concern of government tourism organizations who invest in their promotion. Even though government funds are often limited due to necessary budgetary constraints there is a substantial multiplier effect to investment in tourism promotion. An interesting study by Webber Quantitative Consulting carried out in 2014 estimated the multiplier for return on marketing investment for Australian Inbound to be between 13 and 15. That is, for every Australian Dollar invested there was a return of between 13 and 15 Dollars.

Smart Tourism about in the 21st Century if it is not about providing bookability? It's as being about the application of technology to provide a satisfying and frictionless tourism experience from the very start of the tourism life cycle, ie. researching the destination through trip planning, to the in-trip experience where tourists need the tools to access the information and services they require whilst in the destination.

Lopez de Avila (2015, n.p.) defines the smart tourism destination as: an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves resident's quality of life.

Smart Business Ecosystem
Refers to the complex business ecosystem that creates and supports the exchange of touristic resources and the co-creation of the tourism experience. Buhalis and Amaranggana (2014) describe the business component of smart tourism as being characterized by dynamically interconnected stakeholders, the digitalization of core business processes, and organizational agility. A distinct aspect of this smart business component is that it includes public-private collaboration to an extent that is unusual and results from governments becoming more open and technology-focused as providers of infrastructure and data. In addition, smart tourism recognizes that consumers can also create and offer value as well as monitor and therefore take on business or governance roles.

The traditional tourism business ecosystem included tourism operators, airline or local bus transport operators, hotel or local homestay accommodation operators, attraction, historic scenery excursion and activity operators, shopping department or mall operators, entertainment operators, etc. as Figure 2.
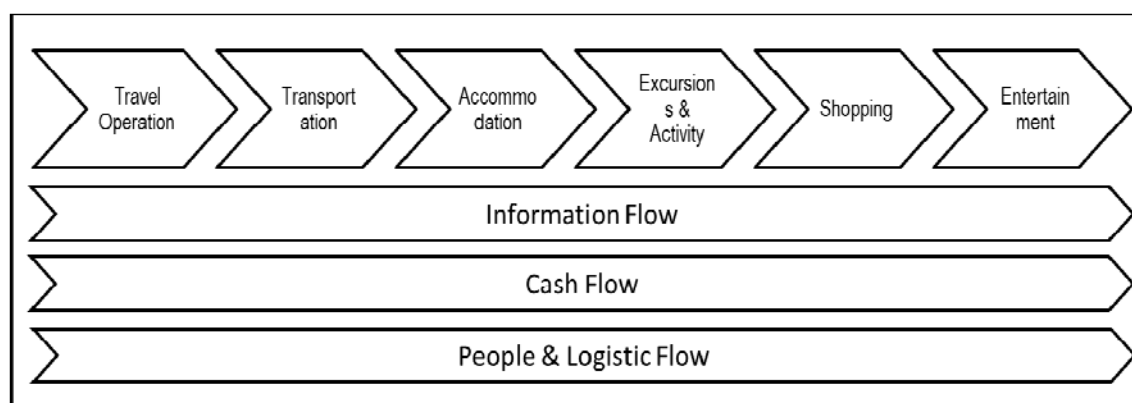
Source: This study

Figure 2. Smart Tourism Business Ecosystem Value Chain

Smart Experience
The smart experience component specifically focuses on technology-mediated tourism experiences and their enhancement through personalization, context-awareness and real-time monitoring (Buhalis and Amaranggana 2015). Neuhofer *et al.* (2015) identify information aggregation, ubiquitous connectedness and real-time synchronization as the major drivers of such smart tourism experiences.

With the focus on the traveler as the user of these systems, these systems aim to support travelers by: 1) anticipating user needs based upon a variety of factors, and making recommendations with respect to the choice of context-specific consumption activities such as points of interest, dining and recreation; 2) enhancing travelers' on-site experiences by offering rich information, location-based and customized, interactive services; and 3) enabling travelers to share their travel experiences so that they help other travelers in their decision making process, revive and reinforce their travel experiences as well as construct their self-image and status on social networks. From the industry perspective, the emphasis is on the potential contributions of these smart systems in terms of process automation, efficiency gains, new product development, demand forecasting, crisis management, and value co-creation (Werthner 2003; Wöber 2003; Sigala 2012a and b; Yoo *et al.* 2015).

ICT and Smart Tourism
With the focus on the traveler as the user of these systems, these systems aim to support travelers by:

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Table 1. ICT and Smart Tourism

Technology	Function	Smart Tourism scenario
Mobile Device/Wearable	Mobile Phone for Web, multimedia, eMail, Apps	Smart Tourism App, Location base App, Target Marketing Device
Cloud	Cloud for Iaas, PaaS, SaaS, IoTaaS, AIaaS	Smart Tourism cloud infrastructure services for XaaS.
Social Media	Online Social engage platform	Smart Tourism social media for smart destination
Big Data	Collect online data for exchange and process	Big Data for Smart Tourism analytic, prediction
AR/VR	Augmented Reality/Virtual Reality	AR/VR for smart destination promotion
Robotic	Robotic for human interaction assistance	Robotic for helpdesk, customer service in destination
IoT	Internet of Thing	Location based service for tourism, transportation
Block Chain	Open distributed ledger technology	Smart contract for tourism, food quality record tracking
Artificial Intelligent	AI/ML provide analytic algorithm	Cognitive engagement, process automation, insight
3D Printer	Transferring image onto a 3D surface	Destination 3D landscape demonstration, Customize souvenir product
Cyber Security	Internet, IoT security	Provide all tourism big data security such as GDPR compliance
5G/NBIoT, Wifi	5G next generation transmitting technology	Smart Tourism data transmitting backbone

Source: This study

Artificial Intelligence and Machine Learning

Artificial Intelligence (AI) was first proposed by John McCullach in 1955 as "science and engineering to make smart machines." It refers to the wisdom expressed by machines made by humans. Usually artificial intelligence refers to human intelligence technology realized by ordinary computer programs.

Supervised learning: Supervised learning algorithms use training data and feedback from humans to learn the relationship between a given input and a given output. Know how to classify the input data and the type of behavior you want to predict, but you need to use algorithms to calculate new data for you. 1. Humans mark input data and define output variables. 2. Train the algorithm to find the connection between the input variable and the output. 3. Once the training is complete - usually when the algorithm is sufficiently accurate - the algorithm is applied to the new data. The most commonly used supervised learning is:1. Linear regression. 2. Logistic regression. 3. Naive Bayes. 4. Linear/quadratic discriminant analysis. 5. Support vector machine. 6. Decision tree. 7. Random forest. 8. Simple neural network.

Unsupervised learning: Unsupervised learning algorithms probe input data without giving explicit output variables. When a lot of training data is not available; that is, the ideal final state cannot be clearly defined; or the only way to understand the environment is to interact with the environment. 1. Unsupervised learning algorithms accept unlabeled learning data. 2. The algorithm learns the inferred data structure from the data. 3. The algorithm learns to identify data sets that exhibit similar behavior. The most commonly used unsupervised learning is:1. K-means clustering. 2. Hierarchical clustering. 3. Gaussian mixture model. 4. Recommender system.

Reinforcement learning: Enhanced algorithm learning how to perform tasks simply by trying to maximize their behavior and reward rewards. When there is not a lot of training data, and the ideal final state cannot be clearly defined, or the environment is known in advance, the only way to interact with the environment is to interact with the environment. 1. The algorithm takes action on the current environment. 2. If the action gets the maximum reward available, it will receive reward feedback. 3. The learning algorithm optimizes the best set of actions by correcting its own mode over time. Enhanced learning is custom-made, integrating various algorithms and optimization. Commonly used enhanced learning applications are: 1. Google AlaphGo 2. Optimize the trading strategy of the options trading portfolio. 3. Optimize the load on the power grid during different demand cycles. 4. Use robots to pick warehouse products and optimize inventory. 5. Optimize the driving behavior of self-driving cars.

Artificial Intelligence and Machine Learning application solution

Cognitive engagement: To engage tourism using AI natural language processing and pattern recognition capability to provide real-time 7*24 services capacity. The available product in market such as Chatbot, voice customer assistant,

Starbucks in 2016 began using AI for serving personalization recommendation, Lowe's bringing AI to three-dimensional space with LoweBots. These machines can navigate stores and understand what customers say, and if they favor a particular item. They

also keep track of inventory levels for best-possible service and use analytics to study the flow of store traffic and when it occurs. The North Face, using IBM Watson's AI to bring in-store boutique service to the internet. Its personal shopping tool, XPS, acts as a digital brand expert. The tool helps shoppers navigate the online experience like an educated in-store associate to help with shopping cart abandonment and relieving shoppers of the conflict caused by choice. Vanguard is piloting an intelligent agent that helps its customer service staff answer frequently asked questions. The plan is to eventually allow customers to engage with the cognitive agent directly, rather than with the human customer-service agents. SEBank, in Sweden, and the medical technology giant Becton, Dickinson, in the United States, are using the lifelike intelligent-agent avatar Amelia to serve as an internal employee help desk for IT support. SEBank has recently made Amelia available to customers on a limited basis to test its performance and customer response.

Cognitive automation is based on software bringing intelligence to information-intensive processes. It is commonly associated with Robotic Process Automation (RPA) as the conjunction between Artificial Intelligence (AI) and Cognitive Computing. By leveraging Artificial Intelligence technologies, cognitive automation extends and improves the range of actions that are typically correlated with RPA, providing advantages for cost savings and customer satisfaction as well as more benefits in terms of accuracy in complex business processes that involve the use of unstructured information.

NASA, cost pressures led the agency to launch four RPA pilots in accounts payable and receivable, IT spending, and human resources—all managed by a shared services center. Swedish bank, Skandinaviska Enskilda Bank (SEB), deploy cognitive robotic process automation software from one of the leaders in the industry, IPsoft, for improving its customer service. AXA Group, French insurance companies, deploying intelligent automation for improving its underwriting. Ascension Health is non-profit health organization in the U.S. already using RPA platform to automate its repetitive manual tasks including, transactions and maintaining patient records.

Cognitive insights provided by machine learning differ from those available from traditional analytics in three ways: They are usually much more data-intensive and detailed, the models typically are trained on some part of the data set, and the models get better—that is, their ability to use new data to make predictions or put things into categories improves over time.

GE has used this technology to integrate supplier data and has saved $80 million in its first year by eliminating redundancies and negotiating contracts that were previously managed at the business unit level. Similarly, a large bank used this technology to extract data on terms from supplier contracts and match it with invoice numbers, identifying tens of millions of dollars in products and services not supplied. Deloitte's audit practice is using cognitive insight to extract terms from contracts, which enables an audit to address a much higher proportion of documents, often 100%, without human auditors' having to painstakingly read through them. IBM Watson Health had provided cognitive insight to hospital doctor by digest patients treatment papers with AI/ML.

Smart Tourism Initiative business strategy
Information technology is critical to business success because it directly impacts the mechanisms that create and capture value for profit: IT is therefore part of the company's business strategy. However, a large body of existing research on IT/strategic relationships does not accurately target IT as a functional level strategy. This general undervaluation of the role of the IT business layer suggests that there is a need to re-edit its role in the strategy, and the complex and interdependent relationship with the organization requires the company to create profits. We use a comprehensive framework of potential profit mechanisms and believe that although IT activities are still part of the company's functional level strategy, they also play a major role in business strategy and have a huge performance impact. Information technology affects the structure of the industry and the range of business-level strategic choices and value-creating opportunities that the company may pursue. Through complementary organizational change, IT can both enhance the company's current (ordinary) capabilities and achieve new (dynamic) capabilities, including the flexibility to focus on rapidly changing opportunities, or to abandon the loss of initiative while recovering significant asset values. This digital attribution also determines how much value a company can capture - once it is digested by competition or through the power of value chain partners, the governance of these partners is itself dependent on IT. We explore these business-level strategic roles in information technology and discuss some of the provocative and future research directions in the convergence of information systems and strategies.
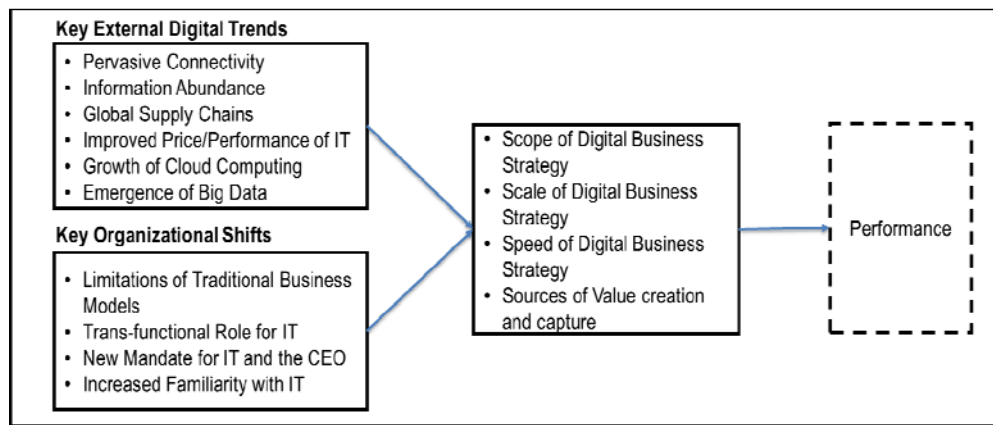
Source: Bharadwaj, Anandhi and El Sawy, Omar A. and Pavlou, Paul A. and Venkatraman, N. Venkat, (2013)
Figure 3. Drivers of the Four Key Themes of Digital Business Strategy

We identified four key themes to guide our thinking about digital business strategies and provide a framework to define these four themes: (1) the scope of the digital business strategy Scope, and (2) the scale of the digital business strategy Scale, (3) Speed Speed of Digital Business Strategy, and (4) Source of Value of Business Value Creation and Capture in Digital Business Strategy. After elaborating these four topics, we will discuss the success indicators and potential performance impacts of pursuing digital business strategies.

RESEARCH

Conceptual model of AI/ML in Smart Tourism
This research proposes a conceptual framework that integrates (1) artificial intelligence/machine learning, (2) Smart Business Ecosystem and (3) Smart Destination to assist smart tourism stake holder to leverage artificial intelligence to integrate cross-departmental business and streamline key performance metrics to build a business-level IT strategy to achieve tourism smart experience. The proposed conceptual model as figure 4.
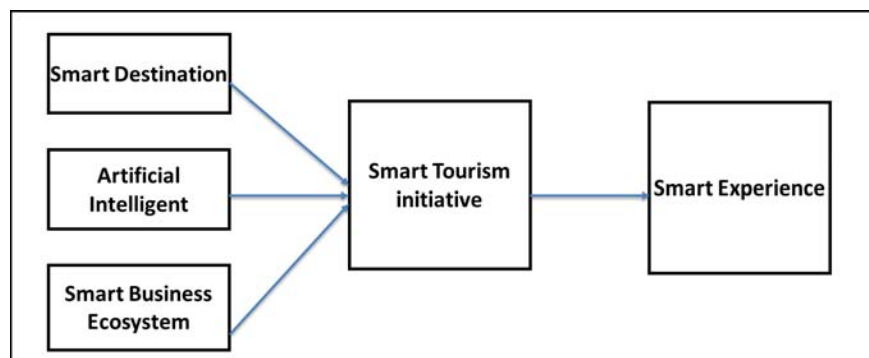
Source: This study
Figure 4. Conceptual model of Smart Tourism with AI/ML

The smart tourism AI/ML conceptual model describe as following:

Smart Experience
AI/ML could help traveler to enhance travel experience by the function of engagement, process automation and insight as

1) Anticipating user needs based upon a variety of factors and making recommendations with respect to the choice of context-specific consumption activities such as points of interest, dining and recreation. By tourism big data collection, AI/ML could learn tourist behavior to predict habit/interest, provide airline, hotel, restaurant recommendation and social group promotion. Also, By RPA process automation could integrate tourist application or inquiry process to automation to provide one-stop-shop process. Robotic, Chatbot could assist tourist for travel information inquiry, online helpdesk nonstop every day.

2) Enhancing travelers' on-site experiences by offering rich information, location-based and customized, interactive services: Robotic and Chatot provide tourism destination, information inquiry, location promotion by analysis GPS and shopping data. NLP

natural language process could provide instant language translation to assist tourist get travel information. Also image recognition could enhance destination rich content information.

3) Enabling travelers to share their travel experiences so that they help other travelers in their decision making process, revive and reinforce their travel experiences as well as construct their self-image and status on social networks: AI/ML could enhance tourist experience by auto bookmark photo with location information and generate photo book automatically. Also, tourist could upload photo to social media group sharing to promotion travel experience with family and friends.

Smart Business Ecosystem

Smart Business Ecosystem include tourism value chain participate provider not only physical provide but also online services provider. The physical tourism business ecosystem includes tourism operators, airline or local bus transport operators, hotel or local homestay accommodation operators, attraction, historic scenery excursion and activity operators, shopping department or mall operators, entertainment operators, etc. Also, there are lots of on-line service provider provide ticket resignation or recommendation such as tourism online service provider (TripAdvisor, GoogleMap), transportation online service provider (Ctrip, Skyscanner, Uber, DiDi, Grab), online accommodation service provider (Airbnb, Trivago), online payment (Alipay, Linepay, Applepay) and social media platform (Facebook, Instagram, WeChet, Weibo, etc.).

Government tourism department or online tourism service provider could build up a smart tourism platform to integrate all physical and online ecosystem to provide one stop shop portal. The smart tourism platform could leverage Cognitive engagement: leverage Robotic, Chatbot, facial/Voice recognition AI/ML for online help desk to help tourism information inquiry, recommendation, etc.

Cognitive process automation: Robotic process automation RPA to automate tourism online or paper process by integrate business ecosystem (include tourism operators, transportation operators, accommodation operators, excursion and activity operators, shopping operators, entertainment operators) internal ERP, ecommerce data.

Cognitive insight: Collect tourism big data with AI/ML for demand forecast, schedule simulation, product development, social media trend prediction, target marketing, sales promotion.

Table 2: Smart Tourism business ecosystem provider

	Travel Operation	Transportation	Accommodation	Excursions & Activity	Shopping	Entertainment
Off-Line	Travel agency	Airline, Local bus transportation provider	Hotel and local apartment Provider	Destinations, Disneyland…	Departments, Mall	Casino, Movie theater
On-line Platform	GoogleMap, TripAdvisor, online travel services provider	Ctrip, SkyScanner, UBER, Grab, DiDi…	Airbnb, Trivago	Online destination ticket services.	e-Commerce, Amazon, eBay, Taobao, JD, PCHome..	Online ticket commerce, Netflix, FOX+
Cash Flow	Apple Pay, AliPay ..					
Information Flow	Facebook, Instagram, WeChet, Weibo…					

Source: This study

Smart Destination:

Smart destination are special cases of smart cities: they apply smart city principles to urban or rural areas and not only consider residents but also tourists in their efforts to support mobility, resource availability and allocation, sustainability and quality of life/visits. Destinations are typically the concern of government tourism organizations who invest in their promotion. Lopez de Avila (2015, n.p.) defines the smart tourism destination as: an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves resident's quality of life.

Cognitive engagement: Smart destination government promotion department could leverage Chatbot and Robotic to provide single contract window to support tourist travel information and registration across business ecosystem. Also, for the purpose of collect

all destination information, government could fund smart tourism cloud service for IaaS, PaaS, Saas and AIaaS for all travel business ecosystem operator.

Cognitive process automation: Smart destination are special cases of smart cities. Smart cities include smart transportation, smart healthcare, smart public safety, smart building, smart energy…etc. Robotic process automation RPA could link all public smart cities services with one single contact window to provide emergency safety, hospital and transportation information and services. Also streamline with all online and physical travel business ecosystem (include tourism operators, transportation operators, accommodation operators, excursion and activity operators, shopping operators, entertainment operators) together.

Cognitive insight: Collect tourism big data with AI/ML for destination development, transportation demand forecast, schedule arrangement, destination flow control, public surveillances monitor.
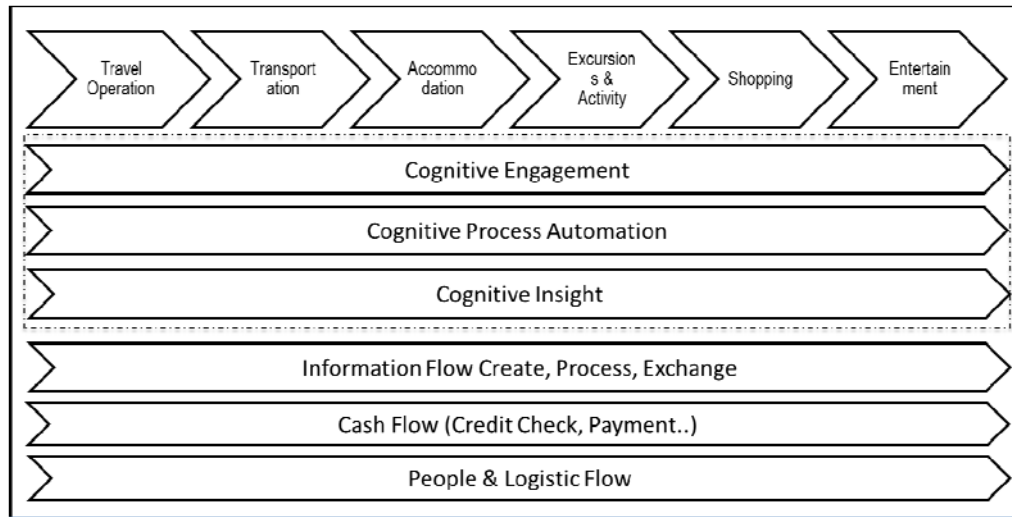
Source: This study

Figure 5. Smart Tourism initiative with AI/ML

Smart Tourism Digital Business Strategy

Based on value chain of exist tourism business ecosystem (tourism operators, transport operators, accommodation operators, excursion and activity operators, shopping operators, entertainment operators, etc.), it can be seen that their information flow and logistics was information islands which cause lack of interconnection and interoperability. There is not only cannot provide one-stop smart services for tourists also no big data collection, analysis, and recommendation/decision-making capabilities. Therefore, three application functions of artificial intelligence and machine learning (cognitive engagement, cognitive process automation, and cognitive Insights) could be leverage to integrating cross-value chain ecosystems, integrating information to develop a smart travel business strategy to differentiate in the global travel market.

The smart tourism business strategy need to consider following:

1. Scope of the initiative business strategy:
Different from the existing tourist value chain, the business function of the business is differentiated. The smart tourism business strategy should distinguish the project scope with smart destinations, integrate all eco-industries across the tourism value chain, and integrate information flow, cash flow and logistics to avoid information island.

2. Scale of the initiative business strategy:
Because the smart tourism project smart project big data learning provides recommendations, analysis, forecasting and other functions, the project scale should be based on plan big and start small, and consider the project planning team personnel artificial intelligence and solution providers. The ability is gradual.

3. Speed of the initiative decision making:
In addition to considering data collection and technical capability, machine learning and training time should be considered for overall project schedule.

4. Source of value creation and capture:
Integrating information flow, cash flow and logistics data to provide recommendations, analysis and forecasting will create valuable big-data assets. It's not only enhance the tourist smart experience but also improve business ecosystem operation

performance and increase profit. Also government policy maker and tourism promotion departments can also use those big data to plan for develop smart destinations effectively and optimize tourism resources.

CONCLUSION

This paper attempted to provide a smart tourism with artificial intelligent digital business strategy conceptual framework. The practice implication is simplify AI sophisticate technology into cognitive function for smart tourism industry digit business initiative. Due to artificial intelligent is emerging technology, the tourism adoption reference is scarce. There is no reference case to experiment and verify. Based on the proposed conceptual framework need further work as 1) Collect use case to verify performance and impact. 2) Further study smart tourism business ecosystem business model. 3) AI cognitive engagement, process automation, insight technology acceptance model verification. 4) Further study smart tourism big data issues (include GDPR, open data).

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