Airports in the E-Commerce Era

COMMERCIAL COMPETITIVENESS IN A DIGITAL WORLD

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Introduction

“The secret of change is to focus all of your energy, not on fighting the old, but on building the new” – Socrates

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“How do airport commercial offerings maintain competitiveness in the era of E-Commerce?”

In considering the answer to that question, one should consider airport commercial endeavours not simply as the present status quo to be maintained, but a continuous evolution of an industry that began in a London Airport tent in 1946. Seeking to maintain the current status is to seek to avoid change, avoid the challenge and ultimately avoid the opportunity.

The evolution of airport commercial activity, from its infancy to the multi-billion dollar industry it is today, teaches us that airports have historically been successful at building on the new. It teaches us that airports have not been avoiding the opportunity by maintaining the status quo. It shows us that airports have known the secret of change.

This research paper will examine current non-aeronautical revenue streams, their individual strengths and weaknesses. It will show that the current status has reached a peak and that new challenges are eroding the growth potential of the current models, which is particularly evident in the developed markets.

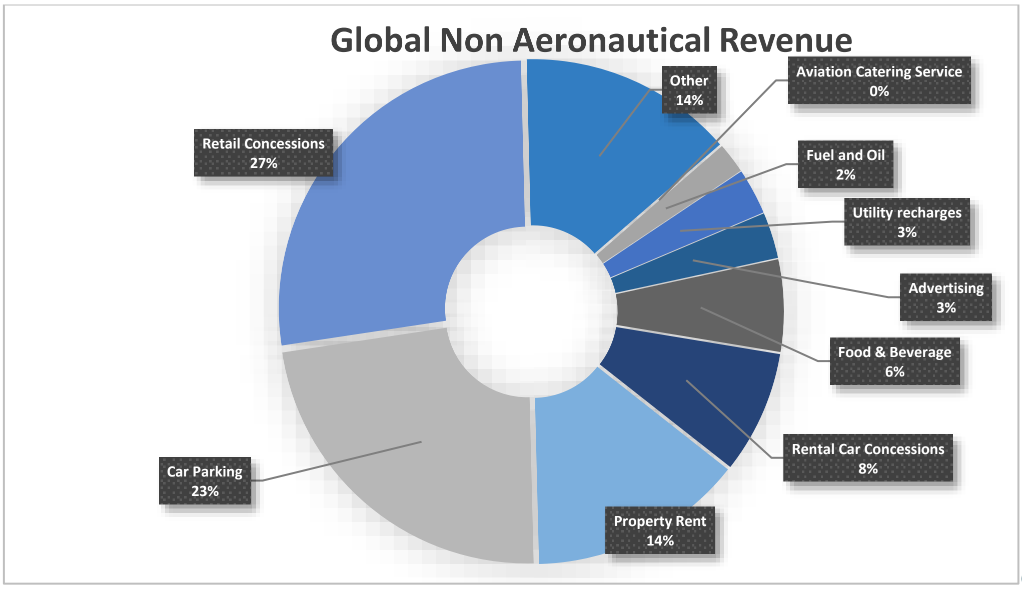
Additionally, the paper will explore how airports customers have evolved. Today’s customer expectations have grown and the key to future success is to continue to innovate to meet those expectations. It will take lessons from the outside world, from businesses who are successful disrupters, and those businesses keeping pace, and apply these to the airport world to demonstrate how to meet those changed customer expectations.

Fundamentally it will reach a conclusion on what airports are, who their customers are and what role airports and their non-aeronautical revenue should play in the future.

Ultimately this paper’s purpose is to articulate a vision on how commercial offerings can now capitalize on the era of e-commerce, not simply to maintain competition with it, by rediscovering the secret of change.

Current Non-Aeronautical Revenue Generation

From the advent of non-aero commercial activity, which can be considered the opening of London Airport (now Heathrow) in 1946, airports have evolved from being public-sector infrastructure facilities into sophisticated service providers. Non-aero revenue has played a significant role in this transformation, now accounting for 40% of global airport revenues (1).



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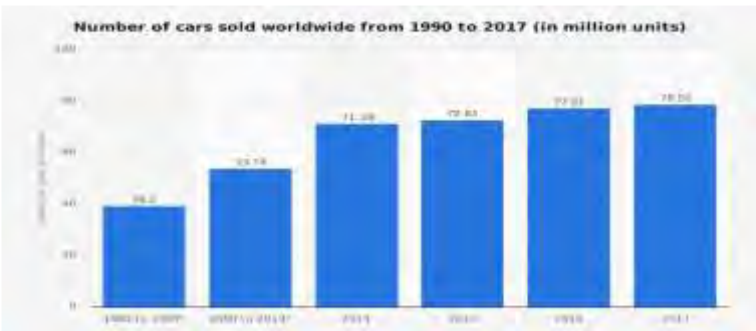
In this global sense, the majority of income generated from non-aero comes from the core streams of Car Parking, Retail Concessions and Property. The exact size of these streams vary from one region to another, with emerging markets skewing further toward Retail. This is a clear demonstration of the reliance airports place on some key passenger dependent revenue streams. In fact when Food & Beverage and Car Rental are included, revenue from streams which directly serve passengers accounts for 64%.

With over reliance, comes weakness. If these core markets are disrupted negatively in any way, this can have a significant impact on the overall performance of each airport business. This weakness is already being exposed: despite global passenger growth of 6.3%, revenue per passenger is falling in the developed markets (North America/Europe). (2)

Taken as a standalone segment, ground transport forms the second largest source of revenue, contributing over 31% in non-aero income. Comprising of Rental Car Concessions and Car Parking, ground transport has been a solid performer in growth as global population car ownership has increased dramatically since the last century.



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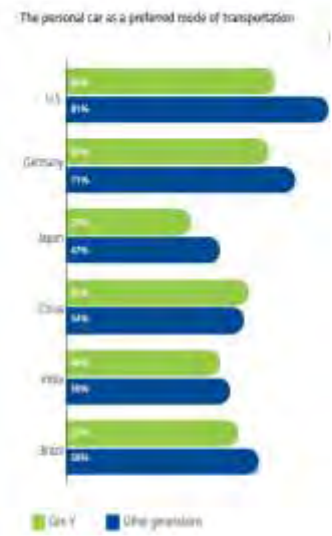
Additionally, the onset of Low Cost Carriers and the increase in accompanying leisure passenger markets has seen a correlative impact on the value of the Car Rental revenue at airports. More people are travelling more often for vacation. In 2015, the Low Cost Carrier Ryanair sold 101.4 million seats versus the legacy carrier group IAG's 95 million seats (10). This increased accessibility for a wider spectrum of the population has meant the number of available potential customers has increased for Car Rental companies.

However, on the horizon, perhaps more visibly than any other non-aero segment, there are disruptors having a significant impact on Ground Transport. Uber and Lyft are just two examples of technology based disruptors who are upsetting the status quo. Many airports first tried to ban these disruptors, fearing the impact to parking revenues with little success. Now these form another revenue source, much like taxi tolls for pick up from the airport. This micro segment is likely to grow in relevance with the personal car as a preferred mode of transportation declining in younger generations in the developed world.



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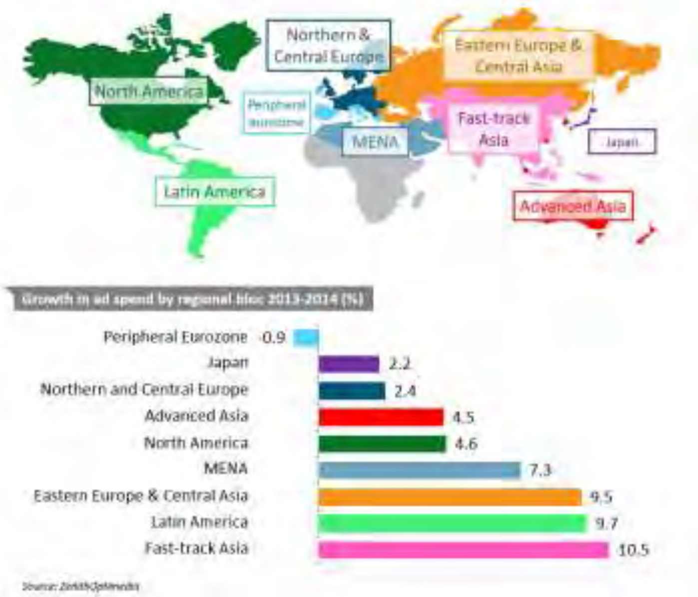
One of the largest segments is Duty Free, making it a key trading indicator for non-aero. Herein lies one of the drivers of this growth stagnation within the terminal, the erosion of the value for money proposition. Duty Free customers increasingly no longer believe that it has a significant enough saving to warrant making it a required part of their journey, making it an impulse purchase vendor. Perhaps in part this is due to a lack of innovation. The duty free market is operated largely the same way as 25 years ago, change has not happened quickly. The same core large Duty Free operators are in the market and the appetite to address difficult issues with government agencies has been low. Add this factor to a change in customer perception of value in a core segment which is now worth more than €6.5billion annually in Europe alone, and it represents serious clear and present danger to the future of non-aeronautical revenue. Between 2010 and 2013 duty free revenue declined 3% per passenger in European airports, a key future indicator for the less mature markets in Asia and the Middle East. (5).

Partly due to opportunism and partly as risk mitigation by airports the number of other streams in non-aero has increased to encompass all areas of the passenger journey and crucially also facilitation revenue streams. The proliferation of ancillary products reaching market, for example CUSS machines for which airports increasingly operate and charge airlines for their use of, is a demonstration of airports providing more services to more parts of the customer journey to monetize each process point. SITA research has indicated that 39% of airports have already implemented assisted bag drop kiosks already with a further 22% planning installation by 2020 (42). Indeed the generation of solar power to be retailed to tenants shows how airports are usurping the traditional service providers to insert themselves into the chain and acquire new revenue streams (15). Diversification is a positive step and the segments of Property Rent, Advertising, Utilities, Fuel and Other (including ICT), which currently only make up 36% of non-aero revenue, will grow in importance.

Globally, advertising forms a small part of the non-aero revenue landscape at 3%. This hides the high yield nature of the segment as well as its future potential. The macro environment for advertising suggests the future has strong growth potential, particularly in Asia and Latin America. However, this potential is also within the context of increasing digital competition, particularly through new social media channels. This has already begun to impact revenue from traditional out of home advertising platforms. Airports are beginning to tackle this impact through wider use of digital media assets in terminals. This will manifest itself within the non-aero revenue results for airports, with growth in digital internal advertising revenue and decline in external advertising (billboards) likely.



Growth in advertising spend 13/14 (6)

Rental income from property accounts for 14% of non-aero revenue, with this likely to increase. Traditionally this revenue is generated from aviation related property rentals, airline administration offices and ground handlers as examples. However airports are increasingly generating more income from land not directly associated with aviation. One example is Boise Airport in North America, which generates 68% of its revenue from non-aero sources (8). On their land there are a multitude of businesses from horse pastures/farm land to warehouses and cell phone towers. Elsewhere, in the Asia-Pacific region, property and real estate revenue plays a critical role contributing 25.4% of non-aero revenue to airports. Indeed, Hong Kong International Airport have taken the aerotropolis (43) concept into practice by developing Skycity – a multi offering facility with retail, dining, hotels, entertainment and offices (44). The goal is to turn the airport into its own city, broadening its purpose away from just aviation. This is a demonstrative illustration of the growing and critical importance of property income, particularly as in many cases this is not dependent on the number of passengers.

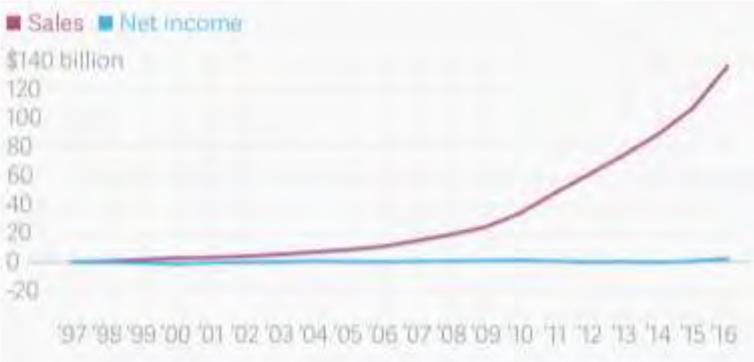
In summary, non-aeronautical revenue is currently a largely passenger dependent segment with a smaller but growing diversification into the non-passenger dependent revenue streams. This is largely accepted as the prevailing strategy for airports, many of whom have maximised their revenues per passenger. The onset of the digital age has meant core service providers in each stream are facing competition from disruptors like Uber and Amazon who are leveraging their ecommerce platforms to better at meet present customer expectations of service and value.

Case Study – Amazon

The synonymous e-commerce company, Amazon was founded by Jeff Bezos in July 1994 as an online book retailer. Now Amazon is the world's largest internet company by revenue. In 2016, Amazon completed $136 billion USD in sales and had a reported 382,000 employees worldwide (12).

In fact Amazon is much more than a straight forward internet company. It is an e-commerce, logistics, payments, hardware, cloud services/data storage and media company. It has also recently bought Whole Foods supermarkets in the US for a reported $14billion USD and is trialling a beta version of a supermarket with no cashiers. It is the pro formo template disruptor company.

A key component of its corporate mission is to always put the customer first. This is often detrimental to its income performance, with profits barely changing from when it listed publically in 1997 whilst sales have increased exponentially.



(12)

Behind this corporate mission is the "flywheel" philosophy. This a cyclical approach to customer acquisition whereby a company cuts prices to attract customers, which increase sales and therefore attracts more customers, allowing economies of scale to develop. This ultimately allows the acquisition of more customers through further price cuts. Essentially, Amazon's modus operandi is to go into an established industry as a disruptor, acquire all the customers and then provide an interconnected ecosystem of businesses and services in order to retain those customers within its control. As of 2015 there were 304 million active customer accounts on Amazon and nearly half of all web shoppers go directly to Amazon for product searches. (12)

Key to Amazons success has been its logistics network: with over 180 warehouses, 28 sorting centres, over 100 hubs and delivery stations, 4,000 trucks, 20 aircraft and reportedly a shipping company to move products directly from China to consumer. (12)

Amazon doesn't like competition. In 2009 it attempted to acquire Quidsi, a rapidly growing e-commerce startup mainly retailing baby and beauty products. Quidsi resisted and in response Amazon created Amazon Mom. With discounting and subscriptions, Quidsi itself estimated Amazon would lose $100 million USD. This did not matter to Amazon, whose activity effectively scared Quidsi's investors. In 2010, Amazon bought Quidsi and later closed Amazon Mom. (12)

Key Lessons:-

- Resistance is futile: competing head on against Amazon is nearly impossible and would take extraordinary reserves of financial capital
- Amazon wants to own its customers and does not want to share them with anyone else.
- Fundamentally Amazon still requires access to its customers to dispense the product or service and aim to do this any given point in their day to day lives – this is a need airports could help facilitate
- Disruptors have huge penetration in younger generations and Amazon is often their one stop shop

Case Study - Brosa

Founded in Melbourne, Australia by Ivan Lim, David Wei and Richard Li in 2014, Brosa is an omnichannel disruptive furniture brand transforming the way people purchase unique designer pieces for their home (16).

How this works in practice is that Brosa is a vertically integrated digital-first retailer, managing all aspects of the customer experience: controlling the entire supply chain from design to delivery, using powerful technology to create an effortless experience for customers. “We’re as much a technology company as we are a furniture company” Ivan Lim CEO has said.

The prevailing mood in Australia amongst retailers is pessimistic. It is widely believed that Amazon will kill off large parts of the retail world as consumers move online to Amazon when it enters the market in late 2017. Brosa CEO Ivan Lim, has spoken at industry events, specifically at Seamless Retail in 2017 on the coming challenge from Amazon. His outlook is much more positive. Indeed, he believes that Amazon entering the market is good, as consumers are conditioned to use online as a shopping destination. He doesn’t believe that the niche Brosa occupies is big enough to attract Amazon’s attention and is different enough that consumers will come out of their digital way to utilise. They already successfully operate in a retail environment that contains IKEA.

Mr Lim is also on record as saying he believes that a new generation of “want it now” shoppers are being left disappointed by Australian retailers that fail to meet expectations. One of the innovations that Brosa offer is to allow customers to track their deliveries in real time right to their door. With an increasingly large amount of Digital Native generations choosing to live in city centres, this feature is especially popular as it allows customers to make arrangements for delivery into apartment blocks at a specific time. This is not available through other retailers who cannot give precise delivery times and provides a unique selling point for Brosa. Equally, it also seems that this is meeting customers’ enhanced expectations in this digital age.

Brosa are not just an online retailer, opening a 500sqm, by appointment showroom, allowing it to complement a bricks and mortar operation with its vertically integrated digital platform (16).

Brosa sales volume is growing at 40% to 50% month on month and generated revenue of more than $10million AUD in Financial Year 15/16.

Key Lessons: -

- Customer Experience is king, you don’t have to compete with larger disruptor companies to win a loyal customer base – you simply have to meet customers’ expectations. The companies that will lose are those who disappoint their customers.
- Online Retailers still need bricks and mortar venues to maximise success
- Technology enables Brosa to meet its customers in any location – it understands its customers’ needs and delivers
- E-commerce wants to meet “want it now” demand but will require a physical point to interact with customers to deliver that instant gratification no matter how quick their distribution model is
- Amazon is not to be feared – it’s an opportunity for flexible vertically integrated companies to take advantage of Amazon educating consumers to use online

Case Study – Shoes of Prey

A global, multichannel retailer of personalised shoes aimed predominantly at female customers, Shoes of Prey commenced trading in 2009 in Sydney, Australia. Founded by Michael Fox, Jodie Fox and Mike Knapp, formally with Google, it has five offices globally with 200 employees. In 2016 its website has had 5 million unique visitors designing over 6 million pairs of shoes. The business broke even after two months and has a multi-million dollar turnover (17).

It has an extremely loyal and brand-promoting customer base which are found in their thousands on its online community. The company has won a slew of awards: Retail Innovator of the Year 2016 at the Australian Retail Awards, Best International Conqueror 2015 and Online Retailer of the Year 2014 at the Online Retail Industry Awards, Kogan Australian Online Retailer of the Year 2013 at the Australian Retail Awards and World Retail Award 2013 for the Store Design of the Year (17).

The award for Store Design of the Year was won for a concept store the company opened within David Jones, an iconic Australian department store in Melbourne. It essentially functioned as a showroom, with technology on hand to allow consumers to order items. It marked the first foray for the company into physical retail (20).

Shoes of Prey markets the ability for consumers to buy customized tailor made shoes, the ultimate luxury at non-luxury prices. The ordering process involves customers choosing the shape, colour, material and heel height of their shoes using their web based 3D designer platform. Their designs are handmade within two weeks guaranteed and delivered globally.

What Shoes of Prey have successfully tapped into is the current trend towards personalisation. Customers are no longer attracted to the acquisition of material goods, they prefer to spend their disposable income on experiences. Psychologically, customers feel stress and frustration when making a planned item purchase, which contrasts with the sense of excitement when making an experiential purchase (17). In essence, because they are in control of the design process they are more satisfied long term with their purchase. This actually means, like Brosa, Shoes of Prey can retail items at aspiration but attainable price points – the value assessment the consumer makes includes the experience as well as the item itself.

Anecdotally this customisation or personalisation of products is an extension of younger generation's behaviour who live their lives in the digital world customising their own personal brand for consumption by their peers online on social media. Uniqueness and personalisation in purchases appears to be a method to gain social media capital.

It is also worth noting that Shoes of Prey make it clear on their website that as everything is made to order, they are environmentally responsible as the number of mass produced products going to landfill every year is reduced. This is an interesting caveat. It demonstrates that they believe the core demographic value experience and also value that experience is not at the cost of the environment. However, it isn't a core message. This leads to the conclusion this is simply a prerequisite check box for their consumers, rather than a conscious choice by their customers to be "green".

Key Lessons: -

- Personalisation is a key retail trend
- Experience carries a higher value than product meaning prices can be higher
- Customisation has a longer term customer satisfaction outcome
- Negative environmental consequences are a barrier to sale, however positive environmental consequences are not always selling point
- Technology allows Shoes of Prey to be vertically integrated. In turn this allows the swift delivery of products and satisfies the "want it now" customer
- E-commercial companies do attempt to enter the physical retail environment to supplement their digital platforms

Case Study – Walkbase

Walkbase is a Finish company founded in 2010 who use Wi-Fi to measure people's indoor location accurately and in real-time. Formed in a university lab, the company has now developed to a technological solution that allows "the high-street dinosaur to bite back" in the new digital world. The solution makes use of existing Wi-Fi installations and is deployed by retailers and airports worldwide.

Their realisation was that bricks and mortar retailers have some unique aspects that cannot be reproduced online, listing these as; "human touch, personal service, touch and feel, the wow effect, or immediacy". Their mission is to equip and enable retailers to embrace these unique aspects in the shopping experience of consumers.

The company boasts their platform "provides real-time analytics on customer's habits so the same level of personalisation can apply in-store as it does online. It analyses in-store customer behaviour, measures and optimises the ROI of marketing campaigns, engages customers with personalised in-store marketing and links the online and offline customer journeys together." (21)

By the end of 2014, Walkbase had analysed over fifty million shoppers, deployed over 2,000 sensors in close to 300 locations including being deployed in Edinburgh Airport and Helsinki Airports.

During the four months between June and September 2014 four million passengers passed through Edinburgh Airport (22). By taking advantage of the existing Wi-Fi technology, airport managers were able to track individual mobile devices, without storing any of the owner's personal data. That positioning information allowed the airport to monitor and improve the user experience for passengers arriving, departing or transferring at the airport. For example, during peak periods it identified and quantified any passenger flow jams at security (24), or in particular shopping areas. The Technology was so versatile it was even on transit buses from car parks to the terminal, analysing impact of parking choices on terminal dwell time & spend. It also examined the customer flow within key retail outlets and informed design changes in new outlets planned for the terminal expansion.

As the use of digital mobile services continues to grow, the validation of this technology will grow. The sensors track an estimated 60% to 70% of people who visit the airport and leave their mobile phones with Wi-Fi turned on. (23)

Walkbase also expect the amount of location-based content to rise and get pushed to passengers' smartphones as they walk through an airport such as changed departure times or gate information, as well as finding transfer directions. An example of this is EasyJet's late boarder GPS tracker. It's designed to track down late passengers and reduce delays through the use of an app that pinpoints a passenger's location in the airport, and send messages to their smartphones letting them know that their flight is about to leave (23).

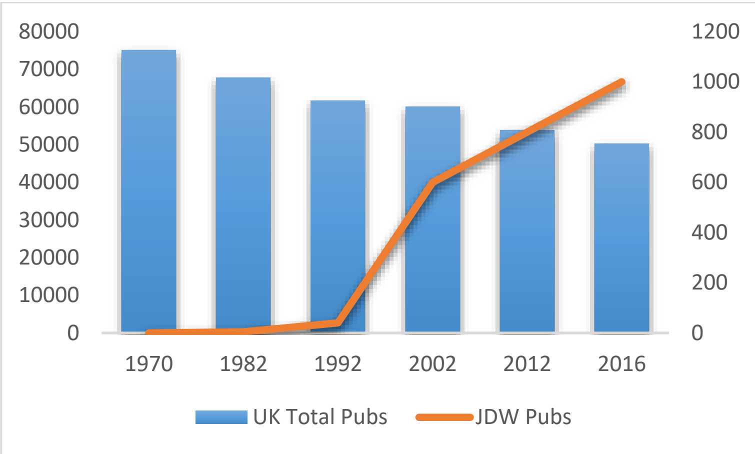
Key Lessons: -

- In most cases Wi-Fi technology is already in place throughout airport terminals so capital investment is low
- Wi-Fi Technology is accessible by majority of passengers
- Enhances customer experience by smoothing the journey through the airport
- Pin point locations allow the targeted messaging of key passengers to drive sales
- Real time information allows airports to directly and proactively influence customer experience as it happens

Case Study – JD Wetherspoon

Founded in 1979 by Tim Martin opening the first pub, JD Wetherspoon (JDW) is a now a major British Pub and Hotel operator. In 36 years of operating the company has opened over 1000 outlets. By 2015 annual sales had exceeded £1.5 billion GPB and the Wetherspoon's had over 35,000 employees. (30) It is the largest operator of pubs not owned by a brewery or under a single brand name in the United Kingdom. In 1992 JDW opened its first airport outlets at Heathrow Airport, it now has 16 airport locations (30). It also has a strong presence at other transport hubs such as train stations.

The British pub industry has been in steep decline for many years, impacted by new legislative restrictions and consumer preferences changing. In 2015 over 27 pubs were closing every week in the United Kingdom. However, JD Wetherspoon's pubs experienced phenomenal exponential growth through this same thirty year period.



(27) (29)

Wetherspoon's owes its success in this very traditional industry, which has barely changed in hundreds of years and is in decline, to its commitment to innovation. The second outlet to open was a converted automobile showroom, Tim Martin having discovered that existing pubs were owned by national brewery companies unwilling to sell to a new competitor (29). Since then the company has converted banks, theatres, cinemas, grocery stores and former nightclubs, many are listed and historically important buildings that the company restores.

In 1993, some 12 years before anti-smoking legislation came into force, Wetherspoon's pioneered non-smoking areas in all of its pubs. A decision which has had a dramatic positive impact on food sales, which carries much higher margins than beverages. Many independent and traditional pubs who did not follow this initiative suffered greatly at the onset of the legislation coming into effect, contributing greatly to closure rates. Food is now significant part of the JDW business and throughout every week it has four "club" days which specialise in a genre of food. Their pubs typically open at 7am and serve breakfast and coffee, competing with the established coffee houses and cafes.

In 2014, JDW opened its first motorway services outlet, open from 4am to 1am every day. This proved to be a controversial move, by this time drink driving had become extremely socially taboo in the United Kingdom. Wetherspoon's is undeterred and intends to open many more outlets (30), seizing on an opportunity to provide quality offerings in a sector which thus far has been restricted to fast food outlets.

Diversifying its income stream, the company moved into Hotels in 1998 (30), increasing the number of locations to 34 by 2015. It has been widely reported that the company would open a 100 room hotel in Dublin Ireland.

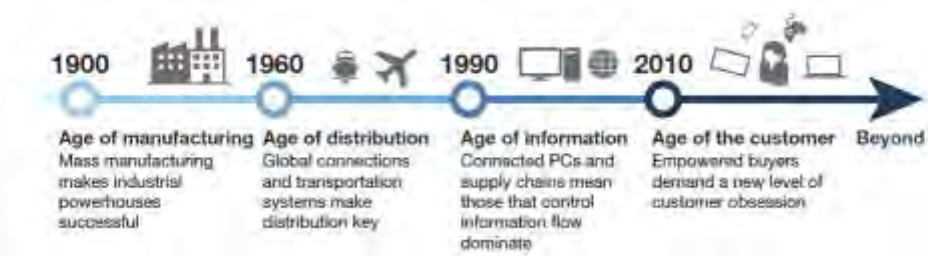
A recent and significant innovation has been the introduction of the Wetherspoon app. Indeed, the Independent newspaper said the app "is the future – not just of pubs but of the world" (32). Prior to the app implementation, customers had to find a table and note its number, before ordering food, drink and paying at the bar. Customers then bring their own drinks back to the table and wait for a member of staff to bring their meals from the kitchen. The app is a simple process improvement that enhances the customer experience. Customers use the app to select their drinks and meals, tell it what the table number is and pay for their purchases. In short order a member of staff delivers their requests direct to the table. The customer never needs to queue at the bar and can customise their order precisely how they would like it. The Independent states this development “could be a threat to the traditional pub – or it could save it”. The app has led to an “exceptional” surge in sales (30), pushing shares in the company close to record values in a depressed market. The company itself initially targeted younger demographics, but found that the app is actually most useful to people who otherwise might find a trip to the pub quite difficult such as customers with disabilities, single travellers and families who can’t leave children at tables alone (30).

Key Lessons: -

- Exponential Growth is possible in a declining market
- Innovation is key to survival and success
- Innovators find ways around barriers
- Technology usage has reached critical mass
- Younger Generations are adopters but technological solutions are also useful to other groups
- Technology improves accessibility, therefore opens offerings up to new unrealised customer groups

Today’s Customers

According to Forrester Research, we’re currently in the age of the customer, a 20 year business cycle in which the most successful enterprises will reinvent themselves to systematically understand and serve increasingly powerful customers. Today’s customer has much higher expectations of service and how companies should deliver it. They want companies to make their lives easier and feel empowered to demand this (35).



(35). (34).

As some disruptors espouse, the focus has shifted away from just simply selling products to creating great overall customer experiences. Customers are better informed than at any other time in history and are less likely to settle for the status quo. This makes them harder to please. *Customer Experience Insight* postulates six key customer buying decision factors in this new age: Transaction process, Product quality, Product performance, Brand and image orientation, Relationship and Customization. The assumption that customers are loyal because “we give them the best deal” is no longer valid (37).

(38).

The expectations of consumers has changed, no longer are they satisfied with walking into a store and being happy as long as the product is available at a reasonable price and functions correctly when they get home to use it. Consumers have an increased number of expectations and attitudes. Whilst some are already ingrained in today’s companies psyche, disruptor companies know that in a connected society, particularly with Digital Natives, there is an opportunity to exploit those elements that consumers feel are underserved (38).

According to Forrester, in their 2018 predictions, 67% of retailers will be unprepared to exploit intelligent agents (36). As empowered customers continue to challenge the established norms, platforms will “collect preferences, behaviours, transactions, and emotions, creating a rich view of an individual. These intelligent agents will use this data to influence consumer options”. What is clear from this prediction is that retailers, or more generally businesses, will need to consider how to use this age of big data to take a greater degree of control on how consumers discover and order. This is a core part of the customers’ expectations: “know me”. Further, they will need to consider how to: “create immersive, dynamic store experiences; use physical stores as logistics nodes for intraday fulfilment; expand digitally; and harmonize this in a differentiated journey for individual customers” (36). By logical extension, those companies that do not embrace the new age will not survive.

Conclusions

"Retail isn't going to disappear but we have to throw out most of what we know. Just keep products and customers at the top of everything" - Sir Stuart Rose (21)

The age of the customer and the digital world means that the normal operating environment for airport commercial activity needs to change. It's the dawn of a new era where customers have power and where fast, nimble disruptors can flex to meet expectations.

How do airports not only meet this challenge, how do they take the lead? Let us examine briefly what airports have historically been good at:

- Airports know they do not make good retailers, that's why airports have concessionaires. Airports tend to get better results from their commercial real estate when they work with segment experts, and for a long time this has worked well: Duty Free sales globally continue to grow as an example.
- Airports have been good innovators, the journey from the London Airport tent to multibillion businesses all over the world has not happened by accident. The premise that commercial offerings are simply facilities has been replaced by genuine customer centric philosophies that push for great unique experiences: Changi Singapore has a butterfly garden, Schiphol Amsterdam has an airport library and Doha Hamad International Airport in Qatar has squash courts.
- Airports diversify their income streams through the multitude of operators on campus. Due to relatively short leases there is nearly always an opportunity to change or try new sources. It is now common to see a "premium security" lane in terminals, with the business seizing the opportunity to exploit another revenue source.
- Airports spend lots of time and energy getting to know their passengers through exhaustive research, ASQ and passenger flow monitoring. Around this knowledge an infrastructure ecosystem has been built to facilitate the passenger journey.
- Historically, the key to commercial success at the airport has been the ability of the airport corporation to facilitate third party partner companies to access their customers. Consider the walk through duty free concept. This is a conscious decision by airports to route passengers, Duty Free customers, directly through the outlet. It is a conscious decision to facilitate more direct access to the customer for the Duty Free operator.

In this new world, customers expect that technology should be an integral part of their experience. The truly innovative airports will recognise that much like the humble traditional British pub, doing the same thing will lead to a slow painful decline. What airports should learn from is the example of an innovative company growing sales in that same declining pub market. Airport CEO's should be thinking about how they adjust their company culture to focus on delivering the terminal infrastructure for the future. Airport Commercial Managers should be thinking about how they can monetize this infrastructure, and work together with ICT Managers, who should be raising the capital and installing the infrastructure now. Airlines are already utilising established beacon technology within terminals, this is a saleable commodity and an opportunity to be exploited.

Airports should return to their greatest skill, the facilitation of access to customers. This extends to all parts of the passenger journey:

- Customers expect that companies will use data about them to provide customised experiences, in airports this could be extended to information delivery: where my gate is? how long it takes to get there? what can I buy on the way? Airline customers have this expectation of the airlines, airports have the power to facilitate the airlines meeting this expectation.
- The same technology could be used to facilitate just in time final mile delivery of services. Airports are not great restaurant or retail operators, but they do know their customers. With technology they will even know precisely where their passengers are. Conceivably there is no reason why passengers should not be able to sit at any seat anywhere in the terminal and order products or services that would be

delivered right to their location. This has an added benefit of monetizing every terminal seat at the same time as reducing the requirement for larger and large terminals:- each outlet will be more productive by making more from less.

- Ecommerce companies are a massive opportunity. Amazon continually demonstrates its desire to reach all of its customers instantly with its logistic developments including drones. Airports have control over the environment their passengers are in, and monetizing this access to ecommerce companies is an important way of mitigating erosion of income from traditional airport commercial offerings.
- Customers expect a seamless journey from the digital world to the physical one and back again. All commercial activity should be cognisant of this new omni-channel reality. As commercial operators seek to bridge the digital gap, their space and technological requirements will change. Airports should be designing terminals that have the trunking and infrastructure in place to meet this future need.

In addition, airports should undertake the following developments:

- A complete integrated customer engagement platform is critical. Customers expect their data to be used for their benefit. All data should be collated and individualised marketing developed, with commercial partners contributing offers in real time.
- All partners should be sharing data in real time. This should feed into a central location, with intelligent agent platforms deciding on the most optimum passenger journey routes for small segments of the population. For example, decisions on the most commercially advantageous gate for a flight to leave from could be made in real time based on data collected about the passengers as they are in the terminal. Digital wayfinding displays and automated gate allocation notifications could manipulate the passenger's journey through their terminal based on the analysis of those passengers. Flights with high spending customers would leave from gates which would require them to pass through zones with products most closely associated with their aspirations or demographics.
- Continued diversification of non-aeronautical revenue into real estate will protect airports from challenges of income erosion within the terminal. Ecommerce Company's value connected logistic nodes and will require land to situate their distribution centres.
- Airports should make innovation a Key Performance Indicator in all their agreements with third parties. It should not be acceptable for existing and prospective partners to fail to invest in the future.

In the paper *Challenges and Opportunities for Small and Emerging Airports in the 21st Century* by Surabhi Rana, one of the key conclusions is for small and emerging airports to consider the adoption of a "Sustainability and Innovation Culture". This is true not only of small and emerging airports, but of all airports no matter their size. In order for airports to be competitive in the ecommerce era, a bold rethink will be required on the current business model for many airports. As Sir Stuart Rose states, "we have to throw out most of what we know".

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