Airport Wi-Fi Service Delivery and Monetisation Strategies – an International Perspective

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Abstract

With internet connectivity becoming an important enabler to knowledge sharing, information access and communication, free Wi-Fi offerings are becoming more prevalent not only in a business context, but also in a leisure context. When looking at the tourism industry in particular, airports are often the point of embarkation and debarkation for very many data hungry travellers that are operating outside of their service provider's jurisdiction. In both the case of the business and leisure traveller, free Wi-Fi offerings have become crucial to ensuring their further mobility. As a result, this research analyses the approaches taken by a selection of international airports spanning Africa, Europe, the Middle East and North America in delivering free Wi-Fi on their premises. The typical approaches taken in order to monetize this high frequency, high demand service are subsequently identified, also noting whether end user Personally Identifiable Information (PII) is collected in the process. Initial findings from the selection of 25 airports from 15 countries indicate that advertising based revenue models, premium (upgraded at a cost) internet service business models, as well as sponsor/third party internet service provision business models are most popular when it comes to airport Wi-Fi service delivery and monetisation. Overall, unique user identification (by means of collecting PII) to make use of these free Wi-Fi services at airports is required by 9 out of 25 (36%) airports, indicating that while Wi-Fi is still regarded as a high-value resource in certain jurisdictions (most notably in South Africa), liberalisation of access is becoming a global reality. The results of this study may be used not only by other airports, but also other high frequency tourist destinations, innovation hubs, entrepreneurial co-working spaces etc., who wish to introduce their own free Wi-Fi services or to diversify their existing revenue streams.

Keywords: Airports, air travel, free Wi-Fi, user experience, service monetisation strategies

Introduction

The offering of free Wi-Fi has become a worldwide phenomenon proving to be particularly popular at high frequency, high volume destinations. The types of destinations where free Wi-Fi is offered vary greatly in kind and include the likes of airports, restaurants, shops, shopping malls, tourism attractions and even cities, to mention only a few. In certain parts of the world, access to the internet via Wi-Fi and other network means is regarded to be a basic human right (Jougleux, 2017) while further studies suggest that access to high-speed internet via Wi-Fi has the potential to reduce and eliminate the digital divide (Middleton & Chambers, 2010).

With internet connectivity undoubtedly becoming an important enabler to knowledge sharing, information access and communication, free Wi-Fi offerings are also becoming more prevalent not only in a business context, but also in a leisure context. When looking at the tourism industry in particular, airports are often the point of embarkation and debarkation for very many data hungry travellers that are operating outside of their service provider's jurisdiction. In both the case of the business and leisure traveller, free Wi-Fi offerings have arguably become crucial to ensuring their further mobility.

By providing free Wi-Fi at airports an opportunity thus opens up for airports to not only engage with international travellers, but possibly also for corporate or industry sponsors to engage

with an international client base. While Wi-Fi can be regarded as a high frequency, high volume service, the value derived from interacting with potential customers may differ from one Wi-Fi provider or sponsoring entity to the next, as is visible in table 1.

Wi-Fi Sponsor	Value Obtained
Operator	Initial bundle (based on time or volume) is offered for a limited time (per venue) in order to encourage end users to buy additional premium access when the free access runs out.
Venue owner	Proprietors of privately owned venues sponsor Wi-Fi to attract or retain patrons for prolonged periods of time. The Wi-Fi is seen as part of the value offered to the end user (for example, in a hotel or at a conference centre). This also includes larger venues such as a shopping mall, public beach or tourist precinct, and could be co-sponsored by a group of commercial interests.
Advertiser	An advertiser pays the operator to interact with end users who, as a targeted audience, do not pay for access.
Analytics user	A company pays for first hand access to end user information, derived from sponsored Wi-Fi access systems. These systems can build sophisticated customer information and aggregate trends based on variables such as customer Internet use behaviour based on location usage information.
Government	A city council, municipality, local, provincial or national government can sponsor Wi-Fi to promote socio-political or economic objectives at the level of a venue, city, province or country.

Table 1. Common Wi-Fi sponsorship models (Geerdts et al., 2016)

Depending on a particular Wi-Fi sponsor's needs, in order to customise engagement with end users, more detailed information such as the end user's Personally Identifiable Information (PII) may need to be collected and shared. This would allow unique identification of each user and also make highly customised interaction at various different levels through marketing big data analytics possible (Johnson, Muzellec, Sihi & Zahay, 2019).

In light of new legislations such as the General Data Protection Regulation (GDPR) introduced in 2018, however, this may become a troublesome prospect for airports, service providers and sponsors from both an administrative and legal standpoint. As a result, alternative monetisation strategies that do not require unique identification and collection of PII may instead be pursued in the interest of simplicity and privacy.

Based on this observation, the purpose of this research is to establish which free Wi-Fi connection and monetisation strategies have been employed at a selection of international airports. It is also noted whether end user PII or other uniquely identifiable information is collected during the process of connecting to the particular Wi-Fi service. This will provide insight into establishing international trends of free Wi-Fi service delivery at airports while also establishing at what 'cost' (in terms of PII or other means) free Wi-Fi is in actual fact provided to travellers.

The discussion is now commenced by analysing the typical user journey associated with connecting to a Wi-Fi network.

Public Wi-Fi Connection User Journey and Interaction

In order to reach and interact with end users of a particular Wi-Fi service, end users are firstly expected to connect to the correct network. The process of connecting to a typical public Wi-Fi network, including those of airports, is illustrated as in Figure 1.
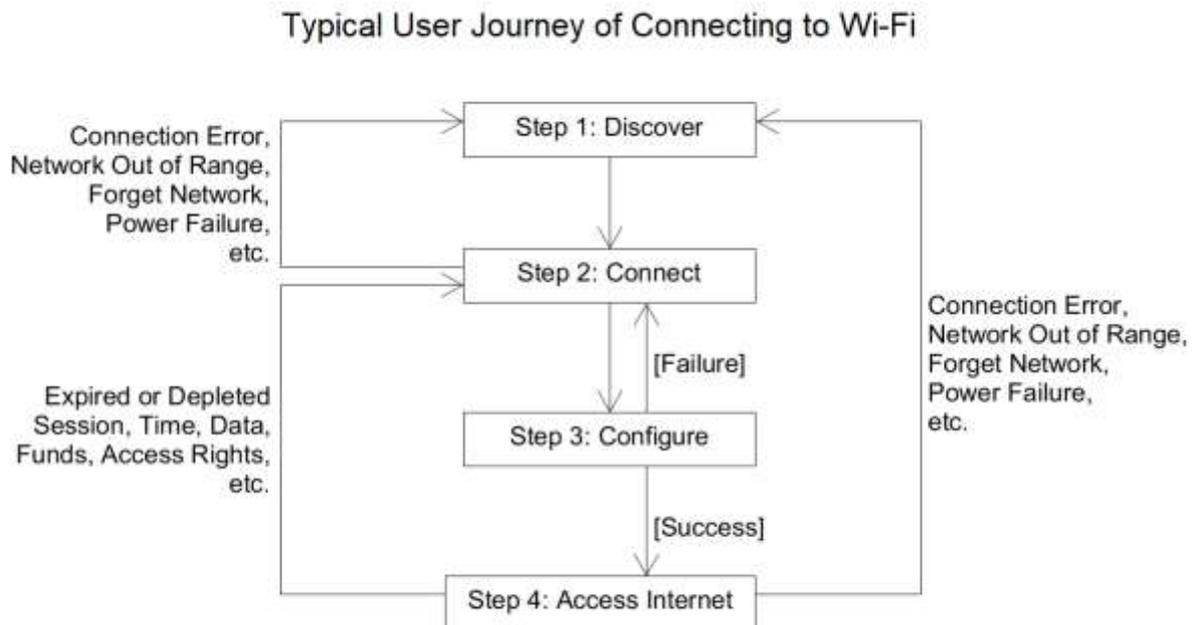
Figure 1. Typical User Journey of Connecting to a Wi-Fi Hotspot (adapted from Louw & Von Solms, 2018).

In step 1, end users are expected to switch on their smart device's network detection functionality and identify the correct Wi-Fi name or service set identifier (SSID) that they wish to establish a connection with. Once the network SSID has been identified, a connection request may then be initiated.

If a successful connection to the network can be established, an end user proceeds to step 2. Once connected to the specific network, the end user is required to configure their connection by entering a password, accepting the service provider's terms & conditions, providing PII, signing up for a service etc. as is seen in step 3. In the event of failure to configure (step 3) the connection, the user remains connected to the network (step 2), but does not have access to the internet services provided (step 4). In the event of successful configuration (step 3), the user is granted access to the internet services provided (step 4) and may make use of the service until their time/data/session expires. Upon expiration, the user is redirected to step 2 where they recommence the configuration process (step 3).

For Wi-Fi providers and sponsors, various opportunities of engagement thus exist throughout the user's journey of connecting to a Wi-Fi network. An investigation on how different airports have decided to implement and monetise their free Wi-Fi service, subsequently also resulting in their Wi-Fi user journey (Figure 1) being unique, follows next.

Airport Wi-Fi Service Delivery Approaches

With a better understanding of how end users typically connect to a public Wi-Fi network, we may now proceed to investigate which techniques or combination of techniques have been chosen by a selection of international airports when expecting end users to connect to their free Wi-Fi.

By means of convenience sampling, a total of 25 airports spanning Africa, Europe (including European Union (EU), European Economic Area (EEA) and the United Kingdom (UK)), the Middle East as well as North America (United States of America (USA)) were surveyed over the 4 year period stretching from June 2015 – June 2019.

We recorded each airport's country and city where it is located as well as the airport's name and international code. On-site we subsequently proceeded to discover the free Wi-Fi network provided by the participating airport, connected to the network, configured (where necessary) the connection and finally, accessed the Internet (as illustrated in figure 1).

During the process of connecting to the respective Wi-Fi networks, the following was noted:

- Identification method – Is the network open access or is uniquely/personally identifiable information (PII) required to sign up and access the network?
- Time or data limit – Is there a limit associated with the use of the service?
- Monetisation strategy – Based on observation, is the service being monetised?
- Date – Which date was the connection to the network established?

In the event of an airport being visited more than once during the June 2015 – June 2019 timeframe and a change in limit or monetisation strategy having been observed, more than one dated entry may exist per airport.

We now analyse the results per continent in alphabetical order starting with Africa in table 2.

Country	City	Airport	Airport Code	Identification	Time/data Limit	Monetisation	Date
South Africa	George	George	GRJ	Unique	-	+ Advertising + Premium Option + Sponsor (VAST)	201809
				Unique	30 Minutes	+ Advertising + Premium Option + Sponsor (AlwaysOn)	201509
South Africa	Johannesburg	Lanseria International	HLA	Unique	250MB	+ Advertising + Premium Option + Sponsor (VAST)	201801
South Africa	Johannesburg	OR Tambo International	JNB	Unique	-	+ Advertising + Premium Option + Sponsor (VAST)	201811
				Unique	30 Minutes /50MB	+ Advertising + Premium Option + Sponsor (AlwaysOn)	201804

Table 2. Airport Wi-Fi Offerings - Africa (by the authors)

On the continent of Africa, 3 South African airports were surveyed and in each case, unique user identification was required to access Wi-Fi resources. In all 3 out of 3 (100%) airports, advertising based revenue models, premium Wi-Fi offering revenue models (where users pay a fee for additional time/data access) and having sponsoring entities involved in providing the Wi-Fi service is present.

The trend in South African airports is thus to outsource the provision of Wi-Fi services to sponsoring entities and allowing them to monetise the service further through premium offerings and advertising. Overall, an outsourced approach is taken.

When looking at Europe (including EU, EEA and UK), a mixture of open and unique user identification approaches have been taken as is visible in table 3.

Country	City	Airport	Airport Code	Identification	Time/data Limit	Monetisation	Date
Belgium	Brussels	Zaventem	BRU	Open	-	+ Premium Option	201905
Czech Republic	Prague	Václav Havel	PRG	Open	-	+ Advertising	201812
England	London	London Heathrow	LHR	Unique	-	+ Advertising + Premium Option	201605
France	Lyon	Lyon–Saint Exupéry	LYS	Open	1 hour (renewable)	+ Premium Option	201804
France	Paris	Charles de Gaulle	CDG	Unique	-	+ Premium Option + Sponsor (Hub One)	201805
Germany	Frankfurt	Frankfurt am Main	FRA	Unique	-	+ Premium Option + Sponsor (T-Mobile)	201804
Italy	Rome	Rome–Fiumicino	FCO	Open	-	+ Advertising + Premium Option	201905
Italy	Venice	Venice Marco Polo	VCE	Unique	-	+ Sponsor (Free Luna)	201812
Netherlands	Amsterdam	Schiphol	AMS	Open	-	+ Premium Option	201804
Norway	Oslo	Gardermoen	OSL	Open	2 hours	+ Premium Option + Sponsor (Avinor)	201806
Poland	Cracow	Jana Pawła II Kraków–Balice	KRK	Open	20 Minutes (renewable)	+ Advertising + Sponsor (Just WIFI)	201904
Poland	Warsaw	Frederic Chopin	WAW	Open	30 Minutes (renewable)	+ Advertising + Sponsor (Just WIFI)	201904
Spain	Barcelona	El Prat Josep Tarradellas	BCN	Open	-	+ Advertising + Premium Option + Sponsor (eurona)	201709
Switzerland	Geneva	Geneva Cointrin	GVA	Unique	120 Minutes	+ Advertising + Premium Option	201902
				Unique	90 Minutes	+ Advertising + Premium Option	201707

Table 3. Airport Wi-Fi Offerings - Europe (by the authors)

An equally diverse set of monetisation strategies have been employed with 7 airports out of 14 (50%) pursuing advertising based revenue models, 11 (79%) pursuing premium Wi-Fi offering revenue models and 7 (50%) having sponsoring entities involved in providing the Wi-Fi service. Premium Wi-Fi offerings is thus a leading revenue model among European airports.

In the Middle East, a combination of unique and open user identification is employed as is visible in table 4.

Country	City	Airport	Airport Code	Identification	Time/data Limit	Monetisation	Date
Qatar	Doha	Hamad International	DOH	Unique	-	-	201709
United Arab Emirates	Dubai	Dubai International	DXB	Open	-	+ Sponsor (Dubai Airports Expo 2020)	201903 201811 201806
				Open	-	+ Sponsor (OL)	201711
				Open	60 Minutes	+ Advertising + Premium Option + Sponsor (Boingo)	201605 201512

Table 4. Airport Wi-Fi Offerings – Middle East (by the authors)

A choice has been made by 1 airport (50%) to not monetise their Wi-Fi service while the other 1 airport (50%) has chosen to involve a sponsoring entity in providing its Wi-Fi service.

In the case of North America (primarily the USA), open access has been granted to users of all airport Wi-Fi as is visible in table 5.

State	City	Airport	Airport Code	Identification	Time/data Limit	Monetisation	Date
California	Los Angeles	Los Angeles International	LAX	Open	-	+ Advertising + Premium Option + Sponsor (Boingo)	201610
California	San Francisco	San Francisco International	SFO	Open	-	+ Advertising	201610
Florida	Orlando	Orlando International	MCO	Open	-	+ Sponsor (Aruba Networks)	201811 201711
Illinois	Chicago	Chicago Midway International	MDW	Open	30 Minutes	+ Advertising + Premium Option + Sponsor (Boingo)	201512
Nevada	Las Vegas	McCarran International	LAS	Open	-	+ Advertising (tastytrade)	201610
New York	New York	John F. Kennedy International	JFK	Open	30 Minutes	+ Advertising + Premium Option + Sponsor (Boingo)	201601

Table 5. Airport Wi-Fi Offerings - North America (by the authors)

In terms of monetisation strategies, 5 airports out of 6 (83%) have pursued advertising based revenue models, 3 (50%) have pursued premium Wi-Fi offering revenue models and 4 (67%) have involved sponsoring entities in providing their Wi-Fi service. Advertising is thus a leading revenue model among North American airports.

With a better understanding of international airport user identification and monetisation strategies, a discussion on possible further implications follows.

Discussion

When closely analysing the findings from the selection of 25 airports, three main airport Wi-Fi service delivery and monetisation strategies emerge including: advertising based revenue models, premium (upgrade at a cost) internet service business models, as well as sponsor/third party internet service provision business models. In the majority of cases, a combination of these are also adopted.

Overall, unique user identification to make use of these free Wi-Fi services at airports is required by 9 out of 25 (36%) airports, indicating that while Wi-Fi is still regarded as a high-value resource in certain jurisdictions (most notably South Africa), liberalisation of access is becoming a global reality (and based on the results presented in this study, is being led by airports based in the USA).

In the digital age, information is the equivalent of currency. This implies that information such e-mail addresses, contact numbers and other valuable PII of an individual may be captured and stored in various electronic databases when they sign up for a service for example. At a later stage, this information may then be (lawfully or unlawfully) repurposed, sold or traded by the database owner – at a price. The more comprehensive and sensitive the data in the database, the higher the price. This implies that while 'free' Wi-Fi at airports in essence does not necessarily cost anything in terms of monetary value, end users still end up 'paying' for the service by offering their time (by interacting with advertisements for example), attention (by reading and accepting network usage policies for example) and in some cases also their PII (by signing up for a free Wi-Fi service for example). Furthermore, research conducted by Cheng, Wang, Cheng, Mohapatra and Seneviratne (2013) indicated that multiple categories of user privacy can be leaked while making use of airport Wi-Fi, such as identity privacy, location privacy, financial privacy, social privacy and personal privacy. Moreover, privacy leakage can be up to 68%, which would imply that two thirds of users on travel leak their private information while accessing the Internet at airports (Cheng et al., 2013). Results indicate that most end users are unaware of this information leakage – an aspect that may urge network service providers and website designers to improve public Wi-Fi service delivery by developing better privacy preserving mechanisms (Chen et al., 2013).

Despite the perceived risks, this research implies that 'free' Wi-Fi at airports is a global phenomenon and arguably also, expected by both business and leisure travellers. Airports and other high volume destinations should subsequently be asking:

1. Can we afford to **not** have free Wi-Fi available?
2. How much are end users prepared to 'pay' in terms of time, attention, PII etc. for free Wi-Fi?

These questions in combination with the free Wi-Fi delivery trends at selected international airports as identified in this research, may be used not only by other airports, but also other high frequency tourist destinations, innovation hubs, entrepreneurial co-working spaces etc., who wish to introduce their own free Wi-Fi services or, who wish to diversify their existing revenue streams.

Conclusion

With the advent of the 4th Industrial Revolution hinging on the adoption of major digitalisation efforts in almost all aspects of business, in certain cases, digital is making the shift from being business support, to being the business itself (Louw & Nieuwenhuizen, 2019). This holds true for free Wi-Fi offerings at a wide variety of public and private spaces, in both business and leisure contexts.

As business and leisure travellers are arguably becoming accustomed to free Wi-Fi offerings at airports, the opportunity to create new digital business models around this service exists on a global scale. By providing free Wi-Fi at airports, an opportunity thus opens up for airports to not only engage with international travellers, but possibly also for corporate or industry sponsors to engage with an international client base.

In this research, from a selection of 25 airports that offer free Wi-Fi, advertising based revenue models, premium (upgrade at a cost) internet service business models, as well as sponsor/third party internet service provision business models were identified as the most

widely adopted and implemented on a global scale. Very often, combinations of these business models have also been employed.

The identification of these trends may subsequently be utilised by not only other airports, but also other high frequency tourist destinations, innovation hubs, entrepreneurial co-working spaces etc., who wish to introduce their own free Wi-Fi services or, who wish to diversify their existing revenue streams.

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