



THE 10X AIRLINE REVENUE OPPORTUNITY





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abstract

As airlines struggle to innovate their ancillary revenue opportunities, many are wakening to the \$1.2 Trillion market of travel and tourism dollars that surround their business. Guestlogix, a travel commerce company, commissioned this White Paper to provide its airline partners with cutting edge thinking on how to tackle this goldmine. This Paper synthesizes the latest research on cutting edge online retail strategies, airline travel, tourism, retail ecommerce, mobile web design, data science recommender systems, consumer psychology, and behavioral economics in order to provide the reader with comprehensive guidance. Success lies in curating travel options throughout the entire customer journey, from travel anticipation through destination and return, with an AI-driven, mobile first technology approach.

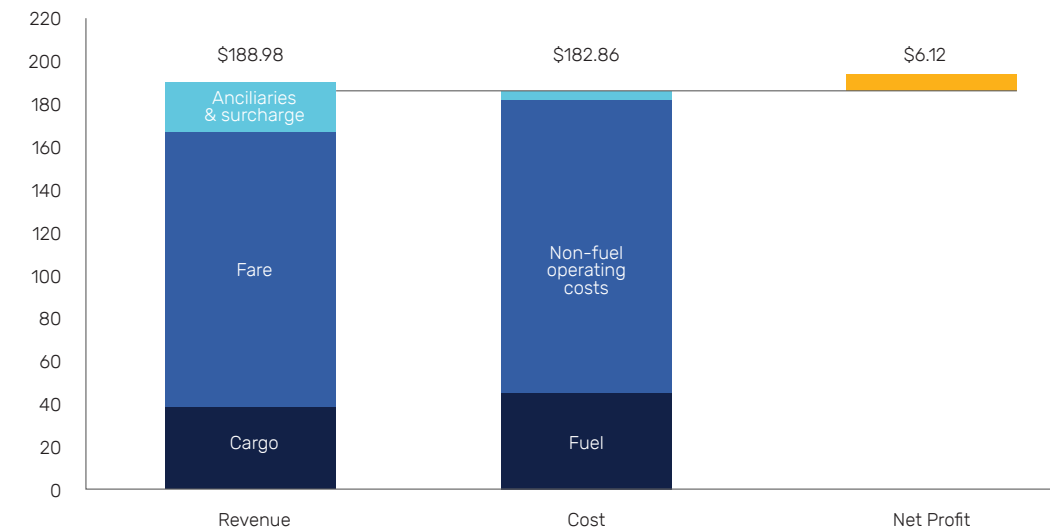
the 10x airline revenue opportunity

More than 4.59 billion flyers will take to the sky this year¹, generating some \$865B globally in passenger airline revenue². Underneath these numbers lies an industry that weathers downward price pressures and upward costs, overall managing with modest profit margins. Airlines have had to awaken (or not³) to the reality that chasing customers down a rabbit hole of discounts to gain market share can be a fool's game. Most have turned to ancillary revenue to eke out their profits. While optimizing in-flight revenue opportunities is surely a necessity, we see a much larger opportunity in the immediate and broader horizon.

Connecting the dots with two core findings from the latest IATA economic report⁴, we come to a pivotal insight.

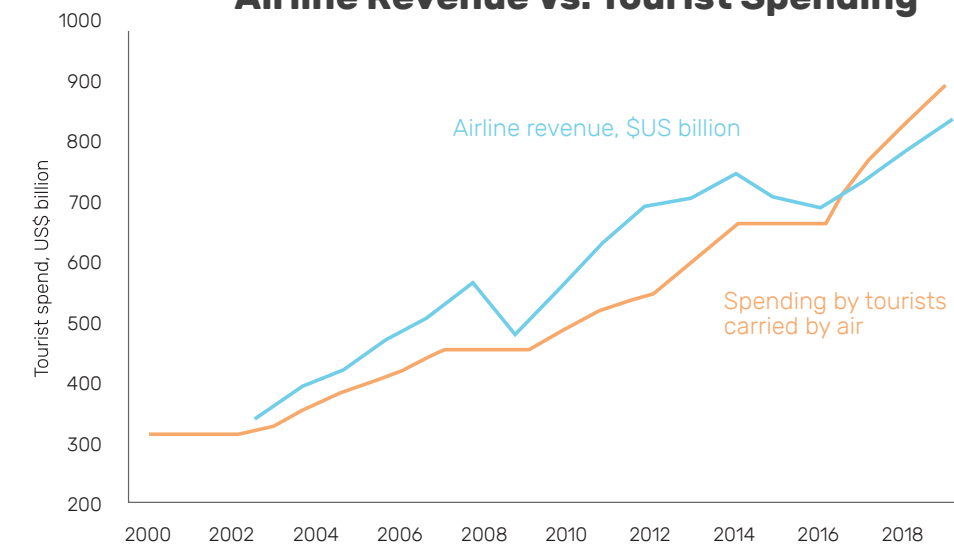
\$6 of Net Profit Per Customer

Worldwide airline net post-tax profit, US\$ per departing passenger, 2019



Source: IATA Economics Economic Performance of the Airline Industry, Mid-Year 2019

Airline Revenue Vs. Tourist Spending



Source: IATA Economics using data from UNWTO, Oxford Economics, IATA Economics forecast

By strategically putting the customer, along with ownership of their entire experience, at the center of their business, airlines have the opportunity to get in on the high growth spend of tourists carried by air. This year it will exceed the global revenue of airlines. With an average passenger spending \$450 per day at destination⁵ on airport transfers, tours, activities, and dining... *It's Time For Airlines To Start Selling The Painting, Not The Paint.*

To venture into areas that are not in their core competency, airlines need strong partners with the latest thinking. Guestlogix, a travel commerce company, commissioned this White Paper to synthesize the latest academic research on cutting edge online retail strategies, airline travel, tourism, retail ecommerce, mobile web design, data science recommender systems, consumer psychology, and behavioral economics to provide its airline partners with a road map to tapping into this goldmine.

market overview

According to the World Travel & Tourism Council, travel and tourism accounted for “10.4% (US\$ 8.8 trillion) of total global GDP in 2018”⁶, higher than most other major sectors including agriculture, banking, auto manufacturing or mining. For airlines, who globally serve both leisure (77%) and business travel (23%) customers⁷, we see an *immediate* Total Addressable Market (TAM) of over \$1.2 trillion that airlines can tap into for ancillary revenue. This figure conservatively includes the following, based on 4.59B passengers globally in 2019:

- \$52 billion for Inflight Services⁸ including the day of travel purchases that frontline airline staff either partially or fully control, which McKinsey’s most recent 2019 survey results put at \$50-\$55B annually.
- \$183 billion for In-Destination Tours, Activities, Attractions and Events, a sector that is growing faster than the total travel market and accounts for 10% of global travel revenue.⁹
- \$193 billion for Transportation including airport travel, parking, and in-destination travel, of which some \$54B is in car rentals.¹⁰ This overall transportation figure as well as the two that follow are based on Expedia’s¹¹ multi-national travel report that breaks down travel spend. Some 11% of a total trip cost is spent on travel compared to 10% on destination activities (i.e., 110% of \$183B).
- \$471 billion in Hotels and Accommodations, accounted for by 26% of trip costs.
- \$308 billion in Food and Dining, accounted for by 17% of trip costs.
- \$20 billion in Travel Related Insurance¹² including Medical Expenses, Trip Cancellation, Trip Delay, and Property Damage in 2019.



With these cautious estimates in hand, it’s little wonder that everyone – agents, app developers, aggregators, airports, booking software to start – wants to own your customer. With the battle set to intensify over the next three to five years¹³, airlines are uniquely positioned to soar to new heights using something incredibly valuable they possess and must never surrender to others: passenger information. Airlines know when people are flying, where they are going, and how long they will be there. With this knowledge comes the opportunity to accompany passengers throughout the lifetime of their journeys, from early planning through to final return. This opens a world of opportunity to delight passengers with much more than just a flight – along with 10x revenue potential of the current ancillary spend.

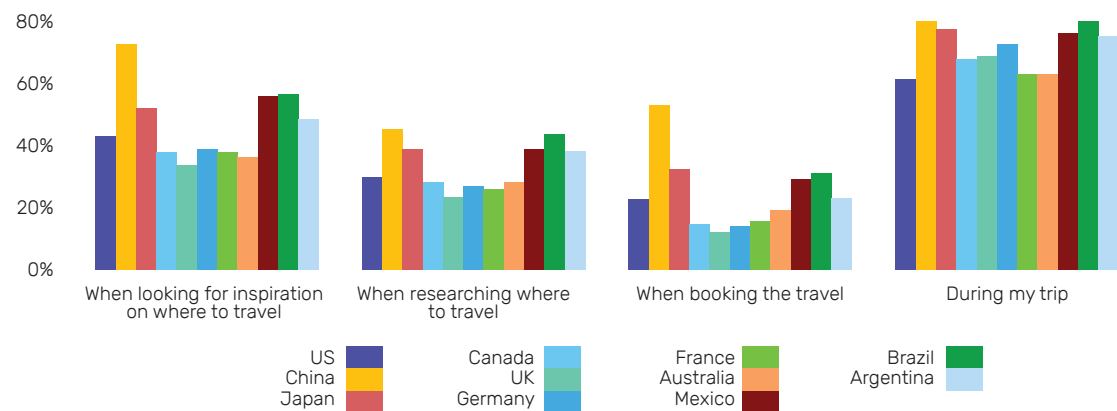
follow the money

From the mundane to the extraordinary, buying insurance to guided outpost tours, passengers are spending more money on travel every year. While de-risking travel and getting value for the dollar matters, so do opportunities to explore “off the beaten path” and “bucket list” experiences. In a survey of travelers from around the world, Expedia found that activities, once-in-a-lifetime, and cultural experiences were all more important considerations than finding the lowest price or getting a deal.¹⁴

This desire for meaningful activities and experiences shows up in the luxury travel market, where growth in outbound luxury trips is projected to outpace by a third that of overall travel over the next decade.¹⁵ As this research revealed, luxury travel is not just for the wealthy. As more consumers access unique travel opportunities, new enriched flavors emerge that put authenticity ahead of materialism. This phenomenon should not be confused with demands for “exotic” experiences as that notion does not quite capture this growing traveler need. Rather, it is a “heightened and delighted attention to the ordinary, which manifests in someone new to a place, [but] does not seem to have a name...”¹⁶ According to a separate 2018 survey, just over two-thirds of affluent travelers would prefer to spend their money on destination activities rather than on a nicer hotel, 8% more than the year before.¹⁷

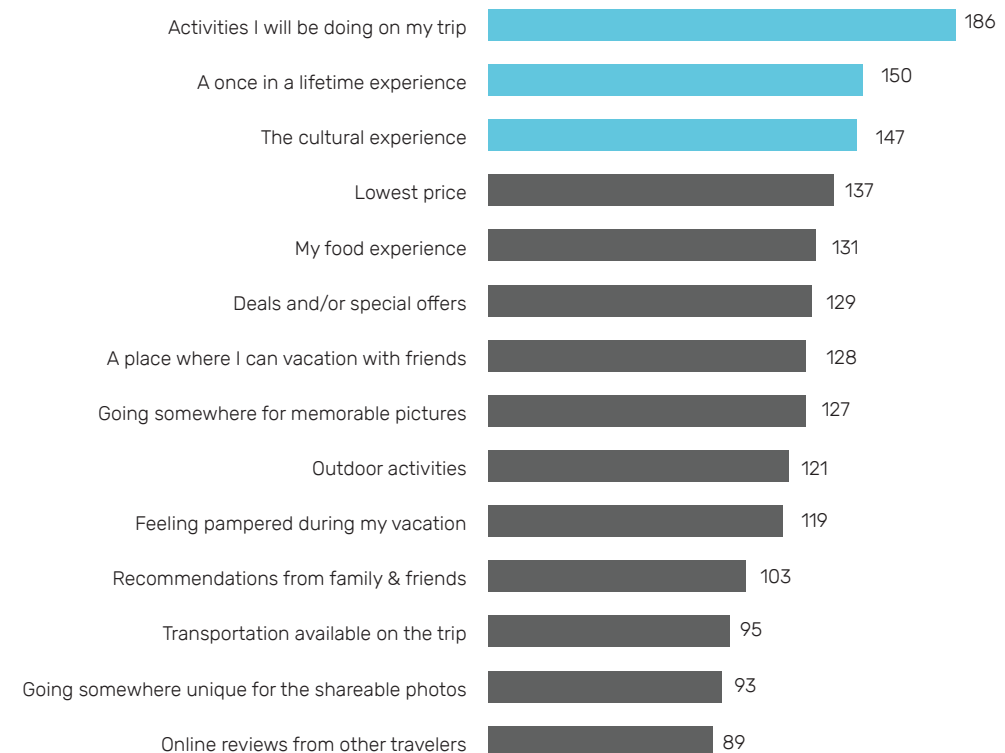
Travelers Use Mobile Throughout The Journey

Chinese and Latin American travelers are most likely to use smartphones at all stages



Expedia Group Media Solutions - Multi-National Travel Trends

Expedia 2019 Multi-National Travel Trends



Expedia Group Media Solutions - Multi-National Travel Trends

So how do passengers seek out great experiences? According to Expedia's survey, while many connect to mobile throughout their entire booking path, during the trip itself, the numbers soar from 60% to 80% depending on the country of origin.

With information available at their fingertips, their desire for immediacy is also increasing. Google reported a 6x increase on mobile searches for “things to do/activities” plus “near me” from 2015/16 to 2017/18.¹⁸ Journey booking through mobile devices will continue to grow. What airlines need to know is how to capture a greater slice of this market, which begins with a more precise way of understanding how these “impulse” purchases are made.

follow the money

passenger impulses

Knowledge of consumer psychology provides valuable guidance on how to frame opportunities to appeal to consumers throughout their purchase path. There are essentially four types of impulse buying¹⁹, that is, spending that is unplanned, compelling and pleasurable.

Planned impulse: I'm taking a trip on a future date and will treat myself while I'm there.

Suggested impulse: I decide I need something after seeing it or when someone suggests it.

Reminder impulse: I realize something is on sale and going fast.

Pure impulse: I'm caught up in the moment and buy something.

To successfully offer up what passengers want on their journey, airlines need to take a different tact for each. Meeting expectations requires moving beyond a traditional ticket-selling mentality, not to a "barrage of offers" approach, but rather to a sophisticated and nuanced digital marketplace that meets customers where they are at, knowing what they will or will not consider buying at each stage of the journey. Passengers should feel great about the impulse purchases they make to enhance their trip. If there is anything close to a magic bullet, it is putting curated, deeply relevant, personalized offers in front of each passenger at exactly the right moments in their journey.



follow the money

mapping the offer

Mapping the four types of impulses to a customer's journey brings clarity to marketers' tasks, especially when it is aligned with the psychology of how consumers spend. As behavioral economists have informed us over the past two decades²⁰, customers employ very different mental accounting depending on the nature and timing of their purchase. Just as there are four types of impulses, there are four "piggy banks" consumers withdraw their funds from including their savings, income, windfalls (rewards typically fall into this category) and pocket money. The mental accounting represents essentially a sliding scale from careful deliberation over time (taking our "savings" and planning out a trip to Vegas) all the way through to hasty decisions made at the moment (spending our "pocket money" at the end of an evening on this same Vegas trip).

Early in the booking path, after a highly deliberated ticket purchase, the mindset of a customer may well be on destination activities but a solid working hypothesis would be that offers ought to be restricted to *planned events* that are funded from carefully deliberated *savings*. For example, options for visits to cultural heritage sites make sense. Offering more expensive on board meal choice options when booking may not. Why not do so? It is not (typically) the right offer to make because a) the timing is wrong, indeed, most people decide on their meal choice within 90 minutes of consumption; and b) the mindset is wrong, mixing price sensitized deals (taken from our mental accounting of the trip we have saved for) with price desensitized offers (taken from our pocket money). Unless the meal being offered is matched and offered as an incredible deal along with the ticket price, it will make little sense to the buyer.

Just prior and on route, moderate "windfall" offers make great sense, including upgrades, jumping the line, inflight purchases and small memorable purchases, to name a few. These are "suggested impulses", and technology plays a key role in surfacing just the right offer at just the right moment in time for each customer. As dates and time for landing draw nearer, further offers that activate "reminder impulses" of items previously researched can be highly effective.

Once at the destination, pocket money and pure impulses reign supreme.

To reinforce the key point, airlines need to curate these moments, intelligently mapping relevant offers to the exact place customers find themselves on their journey. Delivering an optimal experience for each customer while boosting the bottom line is a clear competitive advantage. Contextualized offers help weary travelers not only navigate unfamiliar terrain but also build great travel experiences. While consumers deliberate carefully on the purchase of travel tickets, they reach into separate "piggy banks" in seeking out experiences and respond with fairly predictable impulses throughout their journey. To get part of the action, airlines need to do a rethink on how they curate choice for their customers.



bespoke travel throughout the purchase path



As predicted two decades ago, the experience economy is upon us²¹. The presentation of a curated selection of options recognizes that travelers are hungry for experiences and airlines are uniquely positioned to offer them. That said, it is critically important to understand that typically consumers are more likely to buy, and to be more satisfied with their purchase, when offered well thought through limited choices versus seemingly unlimited choices²². In Expedia's survey of travelers from around the world, the majority reported that they were open to help and inspiration when planning a trip. Inspiring travelers with personalized offers was found to prompt them to extend their length of stay, change their plans for activities, and increase their overall spending.

There are important variations when examining the entire purchase path. Knowing where someone is in their customer journey tells us first what kinds of decisions they are typically making and second how best to curate (and at times limit) these choices. These facts need to be taken into account when considering what choice sets to offer passengers. Too many choices (comprised of both wrong as well as appropriate choices) create cognitive overload which is detrimental to customer decision-making and ultimately to conversion (attachment) rates.

bespoke travel throughout the purchase path

curating inspiration

Early in the process, when picking destinations, research on tourism has identified that up to 22 choices are good but over that number, the likelihood of “no choice” increases substantially²³. Those presented with fewer options are more likely to make a choice and experience lower regret levels about the choice they make. By contrast, having more options can not only lead to decision paralysis (increased likelihood of making no choice) but those confronted by too many choices who ultimately do decide, experience the highest regret level of all. Indecision lingers.

Several psychological factors determine what causes indecision due to cognitive overload. These include how difficult the task of deciding is, how complex the trade-offs in choices are, how uncertain the person is about their preferences, and how quickly they need (or wish) to decide²⁴. While picking among destinations we have never been to before can be exhilarating, the decisions involved are likely to be mentally taxing.

In addition to the necessary decision on travel destination, Greenberg/Google research of leisure travelers in the U.S., U.K., France, and Germany who were involved in travel planning²⁵ revealed the following:

“...in the 12 weeks leading up to a trip, there are 3X more experiences searches than hotel searches and 8X more experiences searches than air searches. And while hotel, air, and car bookings peak six weeks prior to a trip, Greenberg found that experience searches remain stable in volume throughout the 12 weeks leading up to a trip. Whatever they’re searching for, each one of these moments is an opportunity to engage with travelers.”

Thematic ideas and inspiration are key to the curation process here and while obviously the opportunity to book a destination attraction is important, the equally critically important objective is to keep them engaged in app on searches they find enjoyable, not taxing. Travelers are building anticipation at this stage.





bespoke travel throughout the purchase path

curating bookings

Once a destination is chosen, picking a hotel becomes an easier decision. This is because the user is clearer about the decision sets. Here, greater choices can be offered because the user in a well-categorized system can quickly reduce their choice sets to their own manageable number. A large-scale online experiment²⁶ by a leading online travel aggregator involving over 320,000 users, 601,000 searches, and 18,000 hotel bookings, proves the point. Some users were offered a limited set of hotels while others had access to the full list. Overall, while local travelers' likelihood of purchase went up with more choices, travelers going to foreign locations went in the opposite direction – they were more likely to purchase when offered fewer choices. Clearly, customer familiarity with the choice set is an important factor to consider in offering up choices.

Even when large choice sets make sense, as with hotel bookings, there are benefits to well thought through algorithmic approaches that essentially do the heavy lifting of trade-off efforts on behalf of the customer. For example, displaying up to 5 hotel offers at a time with an algorithm that maximizes the utility of price, reviews (including core areas and overall service), star ratings, and availability of rooms has been demonstrated to optimally lead to purchase, as it reduces the number of decision-making steps.²⁷

bespoke travel throughout the purchase path

curating day of travel choices

On a traveler's journey, while in an airport and flying, far more limited choices are the reality. Passengers transition from considering a whole host of options of what they could do in the future to a sequential set of limited choices they navigate moment to moment. Before boarding, a passenger has decided, for example:

- Transport to the airport: bus, train, taxi, ride share?
- Park near (premium) or far (discount)?
- Check or carry-on baggage?
- Seat upgrade?
- Restaurant or lounge?
- Jump the line or stuck waiting?
- Buy-on-board or pre-purchase?

It is helpful in curating choices for these moments to understand the “center stage effect” first uncovered some 25 years ago: even when offered identical products, 70% chose to buy from options placed in the middle.²⁸ Since that discovery, for many retail and food service offers, three choices have become the magic number. The reason, as behavioral economist Dilip Soman explains, is that this middle option typically appears “most reasonable.” At a coffee shop, for example, customers are typically presented with three coffee cup sizes. Even when Soman experimentally manipulated the volume of a middle option cup of coffee up or down two ounces, 70% of consumers chose the middle and claimed the size was “just right” for them.²⁹ This begs the question: for all the small, momentary, but important spending choices passengers make on the day of travel, which follow this basic behavioral economic principle?



There may be three classes of travel but are there three transportation or parking options? Three meal options: frugal, average and luxury? Treating passengers who purchased the very lowest fares (from their savings piggy bank) as if they are in one class of service and product offering throughout the day of travel misses out on so many opportunities. Instead, tap into the many pure impulse, pocket money moments that passengers liberally spend on while at destination.

Keeping passengers in their airline app as they navigate the day of travel options is an important way to build and maximize ancillary revenue opportunities. For many of these choices, three options, not two, is the smart way to optimize these choice sets.

bespoke travel throughout the purchase path

curating destination activities

For a key area we have identified as a tremendous shared revenue opportunity – attractions, activities, events, and tours – choice sets become critically important. Almost half, 48% of experience bookings are happening once travelers arrive at their destination.³⁰ A comprehensive study of 30,814 travelers in the US was conducted along with a review of 82 scholarly papers.³¹ This research assessed the timing of advertising exposure, the degree to which the advertising affected the trip decision, the impact of destination advertising on trip-related decisions, and whether travelers altered (i.e., increased, decreased, or stayed-the-same) the number of attractions visited in response to advertisements. It recognized that advertising in one specific area of travel may not result in a direct purchase, but it had the potential to influence various other aspects of the customer journey. One key overall finding: of all the elements of travel spending, attractions and events are the most influenced by advertising. While the average customer will spend 10% of their travel budget in this area³², advertising will influence an *additional* \$200 spend on attractions than originally planned.

Curation of attractions is a central opportunity for airlines to offer up to their customers. It is key to use categorization to reduce choice overload of activities and attractions. While the use of taxonomic categories (e.g., attractions, tours, current events, etc.) is best at quickly reducing overload, there is a trade-off: it results in less exploration than thematic choices (e.g., beautiful scenery, adventurous areas, fun things to do with kids, etc.).³³ During a flight, consider making thematic choice sets available that entice customers to explore. Without pressing time constraints, a pleasurable set of thematic considerations served up on mobile – online or offline – will appeal to travelers, prompting purchases through “suggested impulses.”

Even short of purchases, consider having passengers provide ratings of various sorts. After landing, serving up a utilitarian taxonomic set of options that allow for fast navigation will make more sense, appealing with “reminder impulses” (e.g., “likely to sell out”, etc.) to prompt purchases. Evidence in support of this approach includes the recent advertising research finding³⁴ that images of escapes to natural scenery create more initial interest among viewers, however, cultural destination attractions (i.e., historical, cultural, and religious pilgrimage sites) prompt more desire to purchase.

Essentially, consumers need to be enticed at the right time to explore. Then when they want to buy, they need as efficient a method as possible to sort choices and to buy. The role of the curator is to recognize these different moments in every traveler’s journey.



bespoke travel throughout the purchase path

curating memories

Finally, at the end of the journey, small non-mentally taxing decisions fall into the category of “the more the merrier.” Souvenir shopping, for example, is found to benefit from more choices, not less, as it results in more sales and lower regret. Travelers are happy sorting through the (mentally) trivial task of looking for souvenirs, especially when they believe it leads to “unique” findings.³⁵

More important to airlines than souvenirs, however, is how they remain connected to their passengers beyond the current trip. Building loyalty is more than just about Rewards points, it is about establishing some credibility with customers such that offers and suggestions for future trips are considered based on previous great experiences. A lingering question remains though: will consumers entrust airlines to deliver on their travel escapes, especially destination activities?

customer relationship status: it's complicated

Certainly, any airline can prompt customers with an advertisement to leave their site and book an activity with a partner. That easy route is becoming more practiced in the industry. Unfortunately, this approach degrades attachment rates since customers are essentially being nudged to continue exploration outside their app, leaving substantial revenue opportunity on the table. Product recommendations have a positive impact on purchases, while links to external sites do not.³⁶

Airlines that establish themselves as the value-added booking partner in their mobile app go down a trickier but more lucrative path. The tricky part does not start with the technology per se but rather with building customer trust. Trust in online marketplaces has three essential components³⁷ which we review below. Airlines would do well to consider where they stand on each.

Our working hypothesis is that most airlines perform very well on the first component - **competence**. Simply, will the app perform as expected and fulfill the transaction? Most airlines have mastered online booking and have well established their credibility with passengers to transact online.

The second component of trust is **integrity** - fulfilling promises and keeping customers secure including their privacy. Promises made equal promises kept; what marketing advertises, operations deliver. Additionally, transparency initiatives such as plain-language disclosures alongside abilities to use proxy/implicit information instead of explicit customer data³⁸ builds this element of trust. Despite a few terrible moments that get amplified in social media, we are inclined to view airlines in a positive light given the ten million-plus passengers who fly every day. Our working hypothesis is that airlines have a great deal more trust established than do online tour operators, events promoters, etc. When airlines curate activity offers, they are leveraging not only their transactional competence but also their trusted relationship with customers to keep them secure.

The third component of trust is where things get tricky - **benevolence**. This part of trust is based on a customer having a positive view toward their airline and with that, a belief that the airline will not act against their interests. It is about belief in fairness, especially on price, while standing behind the product. On this measure, our working hypothesis is that many airlines have some work to do.

Much of ancillary revenue to date has simply been scaling back services, from extra baggage to legroom, and then charging for it as extras. Customers may have caused this by insisting on the lowest ticket prices but acknowledging it is not the industry's fault is not the same as suggesting it is not their problem to solve. The problem bluntly stated is this: will a customer who just felt gouged on a baggage fee stay in the app and buy a walking tour? In behavioral economics, this notion relates to "loss aversion".³⁹ Consumers mentally account for their losses at 2x (or more) what they perceive as their gains.

Many airlines could do a better job of framing costs around their customers' interests, including when appropriate, a reminder of the great deal they got on their ticket. More importantly, though, they ought to be ensuring that for every "negative" charge, there are two to three value-added, delightful purchases they offer. Customers will and already do buy impulse extras on the day of travel, paid for out of their pocket money. Day of flight opportunities to do so abound. Airlines who establish themselves as offering small value adds on the day of travel, whether parking deals, extended insurance discounts, or enticing meal options, are not only capitalizing on immediate revenue opportunities, they are building the trust necessary to stay with a customer through the entire destination experience. Research confirms this approach.

Consumers who buy have flow experiences whereby they are able to gain confidence in use of the mobile navigation through search challenges, so it must be nurtured prior, and be combined with trust, for consumers in turn to engage impulse purchases.⁴⁰



mobile app design matters

Having an existing customer to nurture propels airlines far ahead in the game of selling travel extras. Almost 96% of retail website visits do not end with a purchase. Mobile devices, as a sub-set, convert just 1.2%.⁴¹ For visits to online travel websites in the US (including airlines and aggregators), 53% of visitors will make more than three visits, accounting for 94% of transactions. With an average user making 19 visits over an average of 10 days, it is very clear that shopping for deals is top of mind from the onset of a travel experience. The net result is a 2.4% conversion rate accumulated across all travel websites.⁴²

From the moment a flight ticket is purchased, airlines can capitalize on first-mover advantage. The most important thing for an airline mobile app to achieve from that moment onwards is a psychological state of flow. Reinforcing all our previous path to purchase points of view, this flow is achieved by producing a simple psychological path: performance on the initial purchase → satisfaction with its execution → a willingness to purchase further necessary items → confidence in these transaction → willingness to make an add-on purchase.⁴³

increasing delight & engagement

Shortcuts do not work. This is particularly true assuming that airline customers initially engage in their airline mobile app experience with muted expectations. When gaps exist between expectations and perceived performance, mobile apps that perform better than expected will make users experience what psychologists call “positive disconfirmation.” It is part of a logical decision-making process. When online consumers become delighted with their experience, this informs not only their online repurchase intentions, but also the upsell recommendation opportunities.⁴⁴ High expectation gaps at the beginning followed by unexpectedly high delight after the core purchase can result in a very positive slingshot effect.

While an airline app must facilitate convenience, from the moment of first engagement it must equally inspire confidence. So, while ease of use remains a priority of product design, the app as a shopping experience ought to be “exciting, enthusiastic and inspiring” such that positive emotions are triggered. They are the necessary ingredients and precursors to impulsive buying.⁴⁵ Research on tourism-specific applications confirms this: impulse buying occurs when a website or app is found to be functionally sound, convenient, *and* pleasurable. If customers are simply inundated with offers, then not only is focus lost but out of app straying is promoted.⁴⁶ The goals from the moment of booking should be to keep the customer in your app and engaged.

Long term thinking and relationship nurturing are also key to success. Unfortunately, some airlines follow the route of many aggregators and approach upselling as if modelled after an overly enthusiastic salesperson: way too pushy and solely focused on attach rates. As a very recent study⁴⁷ states:

“... the greatest return on personalisation (3X investment) are those whose primary business objectives are centered on long-term nurturing—as gauged by customer loyalty or lifetime customer value measurements—over short-term goals like conversion rates, increasing AOV [average order value], and reducing bounce rate. It’s clear that when businesses are truly customer-focused, promising results follow.”

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Keeping passengers in app

Customers visit websites and spend time on apps for five essential reasons⁴⁸ and in our opinion, none can be neglected in the development of a mobile airline app intended to garner ancillary revenue. Trying to sell too early in the process and selling too hard through offers such as discounts ironically drives attachment rates down. It diminishes the perception of the brand by throwing out offers that are unrelated to customers search.⁴⁹ Instead, mobile airline apps ought to encourage all five reasons for customer usage:

1. shallow exploration (passing the time looking at fun things to do when you arrive at destination),
2. search and deliberation (find the thing you and others would love to do),
3. knowledge building (build out a plan of the time, distance, weather issues, etc. when it makes sense to go),
4. hedonic browsing (see what others loved about it, get some great visuals, think about ideas to explore), and
5. directed buying (digitally transacting the entire buying experience).

Focusing solely on the last one and ignoring the other four is a quick exit. Apps, like people, must earn the right to an opinion in order to sell. To greatly assist with this process, technology solutions abound.



investing in AI recommender system solutions

When we speak of curation, much of it involves sourcing and then sorting through large volumes of options and then presenting a curated and manageable selection to users. Recommender Systems know who customers are and present to them their best options. For a traveler, this requires knowing not only their destination but also other important considerations such as their purpose in traveling, the weather conditions they will face, and the time they have set aside for fun activities.

When we think of marketing, our mind goes to advertising. Instead of delivering passengers advertisements, contextualized experience opportunities are woven into the mobile journey. Machine Learning intelligence brings to bear the much-needed context to help passengers with knowing what is available at their destination based on a sophisticated algorithmic prediction as to what they, or others like them, tend to like to do on such an occasion. Adjustments can be made based on dates and anticipated weather, who they are with, route preferences and perhaps the budget they have in mind. It is not about a pop-up ad banner in the airline passenger app. It is about passengers seeing things they may enjoy and connecting them to that social activity. Smart systems surface what is pleasurable for travelers to consider while doing the heavy logistics search work for them.

In a nutshell, machine learning algorithms can personalize in-destination experiences for every user. These generally include:

Content-based filtering which is a starting point for recommending tourism destination activities. After cataloguing tens of thousands of destination activities around the world, the discrete elements can be broken down, tagged and characteristics of these items can then be matched to additional items with similar properties.



Collaborative filtering which in tourism generally relies on several intersecting facts, including: i) a user's past purchase behavior (or wish lists); ii) satisfaction ratings by the user for the items, iii) the purchase behaviors of others who can be matched to users, and iv) these matched users' ratings.

context aware recommender system

A typical system provides both content and collaborative filtering, a so-called Hybrid Recommender System. In tourism, these systems are further personalized with contextualized results that account for not only history and what others like, but also their place in the overall purchase path, the geographic place and time the user is (via their mobile device) and what local circumstances they will encounter. These next level systems are known as "Context Aware Recommender Systems" (CARS) that are particularly important for the tourism industry.⁵⁰ Examples of what these systems can become "aware" of, to filter offers include:

Location: Users are informed and guided toward points of interest (POIs) according to their selected categories of interest in a user-defined range with respect to their current location.⁵¹

Time: Recommendations are varied by several time sensitive variables including what stage the user is in their travel planning, when the actual dates/times are that they are available, the duration of the activity, and the time it takes to get to and from it.

Weather: Users are engaged in mobile recommendations by being updated on weather conditions that in turn sort through relevant local in-destination activity choices. Important weather features include "precipitation intensity" and "visibility."⁵²

Group Preferences: Profiles are generated that take in personalized group descriptions (e.g., "activities for families with young children" for families traveling or "space left for parties of 10" for a group travelling together) and user-generated content in the group (e.g., when everyone rates the appeal of certain events and the app aggregates the preferences and sends back recommendations.)⁵³ The latter approach is particularly intriguing when it comes to how group preferences are made. For tourist destinations, algorithms can simply average preferences but can also solve for the highest voted items or the "least misery" items that avoid negative ratings.⁵⁴

Social Media: Systems make personalized suggestions based on a user's tourism-related, user-generated content on social media.⁵⁵ These can be further refined by looking at changing social sentiments over time.⁵⁶

Knowledge Base: Personalized suggestions are made based on explicit knowledge of the decision-making process customers go through, including dependancies in their customer preferences, in order to serve up the best assortment of choices.⁵⁷ It models human reasoning processes for learning and problem solving.⁵⁸

the cold start problem

One critically important issue for airlines newly venturing into Recommender Systems is the “cold start problem.” Knowing what to recommend to a customer when there is either small or no history of usage from them is a major challenge. First impressions matter with mobile applications because getting this right from the onset is critically important to engaging passengers and not having them shut it off after their initial transaction. To overcome this challenge, there are three main solutions that help to prime the proverbial pump: 1) initial surveys, 2) examining social profiles and demographics, and 3) assessing the popularity of items, ratings they have received, and how recently the items were chosen or purchased.⁵⁹

To assist in building out a successful Recommender System for airlines as it relates to destination activities, Guestlogix deploys all three tactics. First, a few non-invasive surveys are delivered at various touch points to help build out user preferences. For example, flight crews are encouraged to complete an engaging brief survey of destinations they have explored and activities and attractions that they have enjoyed. Passengers are then presented with “staff picks” while planning, on route, and at their destination which builds app engagement and system confidence.

Additionally, while browsing, users can be encouraged to “pick favorites” without an obligation to buy. This combination of “shallow exploration” and “hedonic browsing” provides ratings that also feed the system.

Finally, as users engage in search queries, they essentially are providing survey-like touchpoints that update their preferences relative to the in-destination experiences. For example, users can input route preferences for certain activities such as method of transport (e.g., walk, ride, drive, public transit, etc.) and time tolerances (i.e., activity duration plus travel time), from which algorithms can serve up suitable options.⁶⁰

Examining social profiles and demographics is another starting point, essentially conducting initial segmentation analysis to put passengers into categories of people like themselves. Some segments are obvious such as surfacing children’s activities for passengers traveling with children, but others are more sophisticated. Recognizing the imperatives of individual privacy demands, much can be gleaned by examining a combination of click-through patterns along with where a passenger is in their journey from planning through to trip completion. Of note, context aware Recommender Systems are algorithmically evolving such that they can protect privacy both at the context level (e.g., location, time, weather, group members traveling, etc.) and the user interface level (e.g., personal ratings).⁶¹

Third, in addition to the above “first-party” data (i.e., the airline passenger data), Guestlogix combines this with anonymized “second party” data access (i.e., destination partner data) that shows how frequently certain activities are purchased, their associated ratings, and the recency of their usage. Of importance, Guestlogix’ Recommender System approach recognizes that unlike a Netflix application where what you browse, you typically immediately consume, passengers are engaging search over an extended period before the likely transaction. This time aware conversion is a critically important element that, when overlooked, is the subtle culprit compromising many other existing recommendation algorithms.⁶²

Rather than a traditional approach of simply surfacing three banners with rows of curated activities based on “what is popular” (top row), “best-rated across all activities” (middle row) and “newly offered activities” (bottom row), Guestlogix can shift it to what is “best-rated across all categories” (top row), route-specific “flight crew picks” (middle row), and the “#1 best of each category” activity. From there, the user can begin to navigate their own search. This approach has been demonstrated to provide maximum coverage and to induce category exploration which is ideally suited to converting first-time users.⁶³ Attachment (conversion) rates for new users is highest with this approach versus a simplistic “buy this because others did” approach which not only results in lower attachment rates but also discourages the continued use of the mobile application for exploration.

benefits of context aware recommendation systems to airlines



Along with all the necessary components of a modern retail website, “real-time product recommendations create demand for products and services the consumer didn’t intend to purchase in the first place.”⁶⁴ They generate 35% of sales for Amazon and two thirds of the movies watched on Netflix.⁶⁵

Personalized, context driven recommendations have become a travel marketers’ new best friend. Monetate’s 2019 survey of 600 senior marketers in the retail, travel & hospitality and insurance sectors found that organizations are increasingly investing in these AI solutions; currently, 23.2% of businesses already invest in machine learning and 48.5% plan to do so within a year.⁶⁶

Overall, the mobile-first app approach airlines ought to take is a simple bet on the future. Capabilities to browse, research and buy online will continue to grow with “humans in the center” AI-driven solutions. Offering airlines the opportunity to have a “passengers in the center” AI driven mobile application solution will bring them the untapped ancillary revenues they have waiting for them.

conclusion

Many airlines are awakening to the opportunity of connecting passengers to the world of experiences that surround their travel. A Total Addressable Market of over \$1.2 trillion of ancillary revenue can not be ignored. From early days of travel inspiration and planning through to destination and return, airlines are in a unique position to curate great moments for their customers. To do so requires new ways of thinking and of executing on these novel ideas.

Pursuing only incremental gains in ancillary revenue misses the proverbial boat (or plane). It is time to help passengers do more than simply travel from A to B. Reducing the stress of travel while offering up great experiences throughout the traveler's journey is key. Step change is the way forward. Driving 10x in ancillary revenue is within reach using the latest AI-driven technology, underpinned with design based on behavioral economics principles, and offered up on a mobile-first commerce platform.

Airlines have always been in the business of connections. It is time to connect their passengers to the world of experiences that surround their travel.

about guestlogix

Guestlogix is a Travel Commerce company whose platform enables airlines to significantly increase ancillary revenues while improving traveler satisfaction across their entire journey.

Powered by AI and machine learning, the Guestlogix platform incorporates digital concierge services into an airline's mobile channels, delivering highly relevant, personalized information and offers to travelers. With an extensive marketplace of bookable content, ancillary revenue teams can offer the products and services travelers are looking for at every phase of their journey, from planning through to the end of their trip.

Guestlogix works with some of the most innovative airlines in the world including Southwest, Westjet, KLM, and FlyDubai, transforming how they provide value to their passengers while empowering them to become better retailers. Visit www.guestlogix.ai for more information.

endnotes

1. <https://www.statista.com/statistics/564717/airline-industry-passenger-trafficglobally/>
2. https://www.iata.org/pressroom/facts_figures/fact_sheets/Documents/fact-sheet-industry-facts.pdf
3. <https://allplane.tv/blog/2019/2/11/airline-bankruptcies-the-2019-list-is-open>
4. <https://www.iata.org/publications/economics/Reports/Industry-Econ-Performance/Airline-industry-economic-performance-update-Jun19-presentation.pdf>
5. IATA, 2017 Global Passenger Report.
6. WTTC. (2019). The Global Picture. Retrieved from: <https://www.wttc.org/about/media-centre/press-releases/press-releases/2019/benchmarking-italy/>
7. Transparency Market Research. (2019). Travel and Tourism Spending Market – Global Industry Analysis, Size, Share, Growth, Trends, and Forecast 2019 – 2027. Retrieved from: <https://www.reportlinker.com/p05775452/Travel-and-Tourism-Spending-Market-Global-Industry-Analysis-Size-Share-Growth-Trends-and-Forecast.html?>
8. Bouwer, J., Esque, A., & Riedel, R. (2019). Retrieved from: <https://www.mckinsey.com/industries/travel-transport-and-logistics/our-insights/leading-from-the-front-line-how-airlines-can-boost-ancillary-revenues>.
9. Jong, A., Liu, B., & Quinby, D. (July 2017). Tours & Activities Come of Age: Global Travel Activities Marketplace 2014-2020. Retrieved from: <https://www.phocuswright.com/Travel-Research/Destination-Activities-Marketing/Tours-amp-Activities-Come-of-Age-Global-Travel-Activities-Marketplace-2014-2020>.
10. Retrieved from: <https://www.globenewswire.com/news-release/2019/07/18/1884698/0/en/Recent-Research-Global-Car-Rental-Market-Is-Estimated-to-Grow-USD-116-39-Billion-With-Healthy-CAGR-of-14-16-by-2019-2025-Says-Global-Report-Store.html>
11. Expedia Group. (2018). MULTI-NATIONAL TRAVEL TRENDS: A Global Look at the Motivations and Behaviors of Travelers. <https://info.advertising.expedia.com/multi-national-travel-trends-in-the-tourism-industry>.
12. Retrieved from: <https://www.adroitmarketresearch.com/industry-reports/travel-insurance-market>
13. Carey, R., Kang, D., & Zea, M. (February 2012). The trouble with travel distribution. McKinsey & Company. Retrieved from: <https://www.mckinsey.com/industries/travel-transport-and-logistics/our-insights/the-trouble-with-travel-distribution>
14. Expedia Group. (2018). MULTI-NATIONAL TRAVEL TRENDS: A Global Look at the Motivations and Behaviors of Travelers. <https://info.advertising.expedia.com/multi-national-travel-trends-in-the-tourism-industry>.
15. Amadeus. (2016). Shaping the Future of Luxury Travel: Future Traveller Tribes 2030. Retrieved from: <https://amadeus.com/documents/en/travel-industry/report/shaping-the-future-of-luxury-travel-future-traveller-tribes-2030.pdf>.
16. Heneghan, L. (September 17, 2017). Retrieved from: <https://aeon.co/ideas/we-have-a-new-word-for-that-feeling-when-travel-makes-everything-new?>
17. U.S. Affluent Traveler Trends 2018: Annual Survey on Travel Behavior. Retrieved from: <https://research.skift.com/report/u-s-affluent-traveler-trends-2018-annual-survey-on-travel-behavior/>

endnotes

18. Google data. US. April 2015 to March 2016 vs. April 2017 to March 2018. Retrieved from: <https://www.thinkwithgoogle.com/data/mobile-searches-for-things-to-do-near-me/>.
19. Chan, T. K., Cheung, C. M., & Lee, Z. W. (2017). The state of online impulse-buying research: A literature analysis. *Information & Management*, 54(2), 204–217.
20. Thaler, R.M. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12, 183–206.
21. Pine II, J.P. & Gilmore, J.H. (July/August 1998). Welcome to the Experience Economy. Retrieved from: <https://hbr.org/1998/07/welcome-to-the-experience-economy>.
22. Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology*, 79(6), 995–1006.
23. Park, J.-Y., & Jang, S. (S. (2013). Confused by too many choices? Choice overload in tourism. *Tourism Management*, 35, 1–12.
24. Mcshane, B. B., & Böckenholt, U. (2017). Multilevel Multivariate Meta-analysis with Application to Choice Overload. *Psychometrika*, 83(1), 255–271.
25. Google/Greenberg (December, 2018). Global, Travel Tours and Activities Survey and Behavioral Study. Retrieved from: <https://www.thinkwithgoogle.com/consumer-insights/travel-experience-marketing/>
26. Aparicio, D., & Prelec, D. (2019). Choice Overload in Online Platforms. *SSRN Electronic Journal*.
27. Rianthong, N., Dumrongsiri, A., & Kohda, Y. (2016). Optimizing customer searching experience of online hotel booking by sequencing hotel choices and selecting online reviews: A mathematical model approach. *Tourism Management Perspectives*, 20, 55–65.
28. Christenfeld, N. (1995). Choices from Identical Options. *Psychological Science*, 6(1), 50–55.
29. Soman, D. Behavioural Economics and Financial Well-Being, University of Toronto. Retrieved September 10, 2019: <http://www.heqco.ca/SiteCollectionDocuments/Soman%20Summary.pdf>.
30. Google/Greenberg. (December, 2018). Global, Travel Tours and Activities Survey and Behavioral Study. Retrieved from: <https://www.thinkwithgoogle.com/data/travel-experience-booking-behavior/>.
31. Choe, Y., Stienmetz, J. L., & Fesenmaier, D. R. (2017). Measuring Destination Marketing. *Journal of Travel Research*, 56(2), 143–157.
32. Expedia Travel Trends 2019, Ibid.
33. Yun, J. T., & Duff, B. R. (2017). Is utilizing themes an effective scheme? Choice overload and categorization effects within an extensive online choice environment. *Computers in Human Behavior*, 74, 205–214.
34. Lisheng, W. & Zhuowei, H. (2018). A Study of Tourism Advertising Effects: Advertising Formats and Destination Types. *Travel and Tourism Research Association: Advancing Tourism Research Globally*, 8.
35. Sthapit, E. (2018). The more the merrier: Souvenir shopping, the absence of choice overload and preferred attributes. *Tourism Management Perspectives*, 26, 126–134.

endnotes

36. McDowell, W. C., Wilson, R. C., & Kile, C. O. (2016). An examination of retail website design and conversion rate. *Journal of Business Research*, 69(11), 4837-4842.
37. Wu, I.L., Chen, K.W., & Chiu, M.L. (2016). Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users. *International Journal of Information Management*, 36(3), 284-296.
38. Gerlach, J.P., Eling, N., Wessels, N., Buxmann, P. (2018). Flamingos on a slackline: Companies' challenges of balancing the competing demands of handling customer information and privacy. *Information Systems Journal*, 29(2), 548-575.
39. Thaler, R.M. (1999). Ibid.
40. Wu, I.L., et al. (2016). Ibid.
41. Aparicio, D., & Prelec, D. (2019). Choice Overload in Online Platforms. *SSRN Electronic Journal*. doi: 10.2139/ssrn.3044096
42. Park, C.H. (2017). Online purchase paths and conversion dynamics across multiple websites. *Journal of Retailing*, 93(3), 253-265.
43. Martínez-López F.J., Esteban-Millat, I., Argila, A., Rejón-Guardia, F. (2015). Consumers' Psychological Outcomes Linked to the Use of an Online Store's Recommendation System. *Internet Research*, 25(4), 562-588.
44. Lin, C., Wei, Y., & Lekhawipat, W. (2018) Time effect of disconfirmation on online shopping, *Behaviour & Information Technology*, 37(1), 87-101.
45. Shirmohammadi, M., Ghane, N., & Ebrahimi, M.R. (2015). Investigating and prioritizing the effective factors on internet impulse buying behavior of customers (case study: discount group sites). *International Journal of Information, Business and Management*, 7(3), 275-290.
46. Rezaei, S., Ali, F., Amin, M., & Jayashree, S. (2016). Online impulse buying of tourism products. *Journal of Hospitality and Tourism Technology*, 7(1), 60-83.
47. Monetate. (2019). 2019 Personalization Development Study. Retrieved from <https://get.monetate.com/2019-personalization-dev-study/>.
48. Moe, W.W., (2003). Buying, Searching, or Browsing: Differentiating Between Online Shoppers Using In-Store Navigational Clickstream. *Journal of Consumer Psychology*, 13(1-2), 29-39
49. McDowell, W. C., Wilson, R. C., & Kile, C. O. (2016). An examination of retail website design and conversion rate. *Journal of Business Research*, 69(11), 4837-4842.
50. Neidhardt, J., Kuflik, T., & Wörndl, W. (2018). Special section on recommender systems in tourism. *Information Technology & Tourism*, 19, 83-85.
51. Amoretti, M., Belli, L. & Zanichelli, F. (2017). UTravel: Smart Mobility with a Novel User Profiling and Recommendation Approach. *Pervasive and Mobile Computing*, 38, 474-489.
52. Trattner, C., Oberegger, A., Marinho, L., & Parra, D., (2018). Investigating the utility of the weather context for point of interest recommendations. *Information Technology & Tourism*, 19, 117-150.
53. Weiwei, D., Peihu, Z., & Jian, M. (2018). Enhancing group recommendation by knowledge graph. *PACIS 2018 Proceedings*, 214, 1-8.
54. Dara, S., Chowdary, C. R., & Kumar, C. (2019). A survey on group recommender systems. *Journal of Intelligent Information Systems*, 1-25.

endnotes

55. Missaoui, S., Kassem, F., Viviani, M., Agostini, A., Faiz, R. & Pasi, G. (2019). LOOKER: A mobile, personalized recommender system in the tourism domain based on social media user-generated content. *Personal and Ubiquitous Computing*, 23(2), 181-197.
56. Zheng, X., Luo, Y., Sun, L., Zhang, J., & Chen, F. (2018). A tourism destination recommender system using users' sentiment and temporal dynamics. *Journal of Intelligent Information Systems*, 51, 557-578.
57. Mandl, M., Felfernig, A., Teppan, E., Schubert, M. (2011). Consumer decision making in knowledge-based recommendation. *Journal of Intelligent Information Systems*, 37, 1-22.
58. Bahramian, Z., Abbaspour, R. A., & Claramunt, C. (2017). A Cold Start Context-Aware Recommender System for Tour Planning Using Artificial Neural Network and Case Based Reasoning. *Mobile Information Systems*, 1-18.
59. Silvaa, N., Carvalhob, D., Pereiraa, A., Mourãoc, F., & Rochab, L. (2019). The Pure Cold-Start Problem: A deep study about how to conquer first-time users in recommendations domains. *Information Systems*, 80, 1-12.
60. Campigotto, P., Rudloff, C., Leodolter, M., & Bauer, D. (2017). Personalized and Situation-Aware Multimodal Route Recommendations: The FAVOUR Algorithm. *IEEE Transactions On Intelligent Transportation Systems*, 18(1), 92-102.
61. Polatidis, N., Georgiadis, C.K., Pimenidis, E., Stiakakis, E. (2017). Privacy-preserving recommendations in context-aware mobile environments. *Information & Computer Security*, 25(1), 62-79.
62. Ji, W., Wang, X., Zhu, F. (2017). Time-aware conversion prediction. *Frontiers of Computer Science*, 11(4), 702-716.
63. Rezaei, S., et al. (2016). Ibid.
64. Chen, L., Ayanso, A., & Lertwachara, K. (2018). Performance Impacts of Web-Enabled Retail Services: An Empirical Study. *Journal of Computer Information Systems*, 58(4), 301-311.
65. Lee, D., & Hosanagar, K. (2014). Impact of Recommender systems on sales volume and diversity. Proceedings of International Conference on Information Systems. Retrieved from: <https://aisel.aisnet.org/icis2014/proceedings/EBusiness/40/>.
66. Monetate. (2019). Ibid.



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