IMPROVE CUSTOMER EXPERIENCE, CONVERSION AND MARKET SHARE

HARNESS THE POWER OF THE LATEST CACHE TECHNOLOGY

Sponsored by: **intuitive**

Written by
Cristina Polo

About this report

Improve customer experience, conversion and market share
Harness the power of the latest cache technology

A PhocusWire Report in partnership with Intuitive.
Author: Cristina Polo

Published in 2021 by PhocusWire. We are a brand of Phocuswright,
a wholly owned subsidiary of Northstar Travel Media, LLC.

Contents

Selling package holidays online

History.

In the golden age of tour operators, customers would choose their next trip with limited flexibility. Fixed departure dates, due to a limited number of routes and flight rotations (weekly charters) would characterize prepackaged travel products sold offline. The offering was by definition limited in number, built based on a limited number of suppliers. The hotel component resulted from committed direct contracts.

Since then, the supply has developed tremendously.

- On the air segment, the low-cost carrier rise contributed to the offering increase while allowing customers to book their air tickets directly. Both low-cost and traditional airlines opened new routes and increased the frequency on existing routes resulting in a wider choice for the travelers.

- On the hotel side, bed banks have provided online travel agencies and tour operators the opportunity to access a larger and more flexible room inventory since direct contracting is not required anymore. From thousands to hundred-thousand hotel rooms.

- Thanks to component-based pricing, OTAs and tour operators now have billions of options to promote online giving travelers a great variety of flexible options.

Theoretically, dynamic packaging should satisfy traveler's appetite for unique, customizable, dream trips booked fast and easily online. Unfortunately, nothing is as simple and the ever-growing offering can be overwhelming and frustrating for the customer on the hunt for their next holiday.

On the OTA and tour operator's side, the issue is therefore to provide customers a great seamless experience to improve conversion and retention. This encompasses managing data from an ever-increasing number of suppliers, delivering an instant search whilst promoting their bestselling properties.

Accessing flight and hotel component availability and costs: The balance of live-vs-cache search.

The majority of tour operators and OTAs are still pulling availability and rates to package and sell them to the customer at the time of the search. They use "live search", meaning that once the client has defined their specific search criteria for air and hotel (date, destination, departure, number of travelers), the online platform connects and searches among all various supplier's availability and prices, before returning the best possible results to the customer. Availability and rates are accurate; however, the customer might perceive it as a "lengthy" process since they have less and less tolerance to the latency of the result (2-5 seconds at very best, often 20-60 seconds at worst before the results are displayed). In addition to latency, no recommendation is made from the agent side: specificities are required from the customer upfront and each potential destination needs to be searched separately.

"Cached-searches" offer a great alternative since caching combines speed and breadth. This isn't new, however, only a limited number of travel companies utilize it, with the exception of populating "special offers" pages.

So, how does it work? The cache stores the most wanted data "at hand" avoiding the lengthy search so the travel consumer gets search results instantaneously. As Intuitive's software architect, Matthew Abbott explains,

> "a cache is a huge database of pre-calculated rates – the work has been done during the build phase to create a resource of dates, durations, passenger combinations, with costs associated that can be used immediately – no work on a third party is required".

Regarding breadth, with caching technology, search parameters are quick and easy, even as far as allowing the customer to leave search choices blank (destination, date etc.) to generate inspirational search results. Instant filtering quickly allows the customers to narrow their

choices increasing the conversion rates. By widening the search, it allows customers to take control with tour operators and OTAs influencing the promotion and matching of their best-selling holidays. Utilizing caching technology allows you to import and store all flights and hotel costs from all your suppliers, making them available across all channels including B2C websites, mobile apps and meta-search comparison sites.

With each customer search you will dynamically package, flights and hotels creating literally billions of unique packages for the customer to choose from.

Changing the customer's narrative

From being forced to search
"I want to go to Ibiza on 16 August for two adults and one child who's 4-years old"

> To being able to just search
"I fancy a beach holiday in the Med"

Addressing customer needs with cached-search

Traveler's needs during the online purchasing journey.

In essence, travelers want to be inspired, they want flexibility and customization. Also, they book where it is fast and user-friendly.

As Google U.K.[1] restated in June 2021,

> *"when it comes to deciding where to go, consumers increasingly seek inspiration and ideas online."*

Post pandemic there is a pent-up desire to travel, to escape the routine, to explore new destinations and in some cases tick off their bucket list. They are looking for recommendations for their "dream holiday" in safe destinations.

Customers look for inspiration, ideas, regarding the destination. They also welcome alternative recommendations to their search on alternative dates at a better price to a similar destination. Once they find an appealing suggestion, they want it to be adjusted to their needs. This customization process includes criteria such as specific dates, meal plans, hotel star rating, budget, facilities, etc.

Unfortunately, based on recent research, most customers don't buy dynamic packages yet. Phocuswright's U.S. Consumer Travel Report 2020[2], shows that 86% of travelers buy travel components individually. Whether they haven't found a satisfying solution on one single platform (supply-related issue, speed of the platform), or they haven't realized they could do the customization online, **dynamic packaging represents a great opportunity for OTAs and tour operators and the interest of the youngest generation is obvious**. In this study, while 22% of the U.S. travelers bought a dynamic package, the share reaches 41% of the Gen Z travelers.
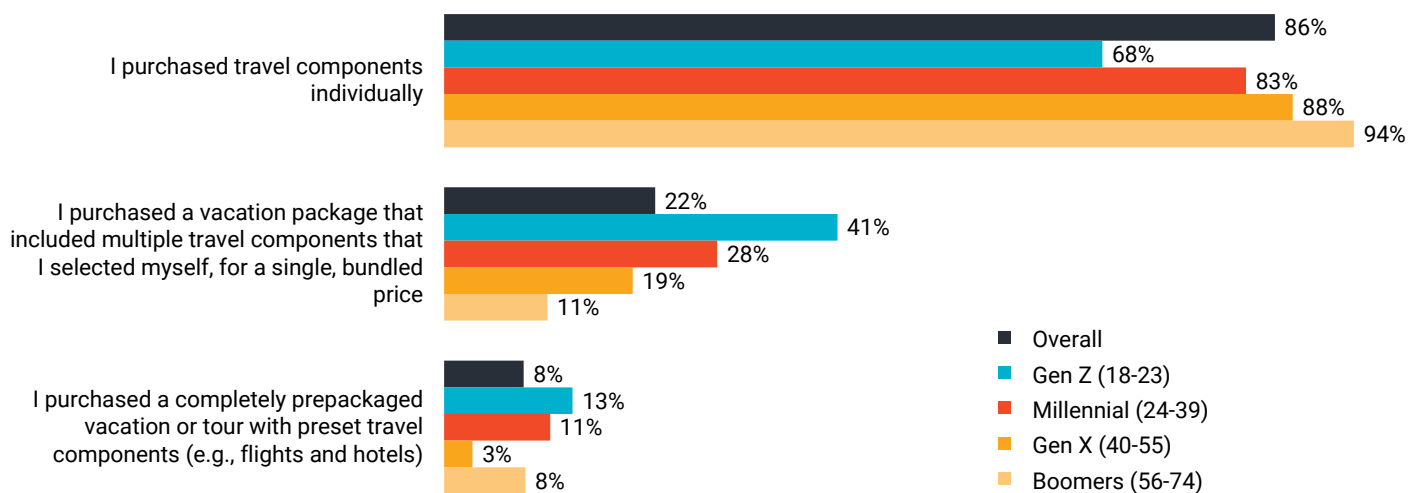
In Europe, the majority of the travelers also buy the travel components separately despite a strong travel package history as reported in Phocuswright's Europe Consumer Travel 2018[3]. The development opportunity for OTAs and tour operators is actually even bigger since much less customers have considered dynamic packages, including the youngest age groups (23% of the 18-24 years in U.K., 19% in Germany and only 13% in France had bought dynamic packages in 2017-2018).

---

1   "What's next for travel? Three actions to meet changing consumer demand" Paul Guerrieria, Finnbar Cornwall, June 2021, Google U.K..

2   Source: U.S. Packaged Travel Market Report 2020-2024, February 2021, Phocuswright

3   Source: Europe Consumer Travel 2018: Shopping and Booking, October 2018, Phocuswright

Figure 1 - Travel Component Booking by Age in the U.S.

I purchased travel components individually
- 86%
- 68%
- 83%
- 88%
- 94%

I purchased a vacation package that included multiple travel components that I selected myself, for a single, bundled price
- 22%
- 41%
- 28%
- 19%
- 11%

I purchased a completely prepackaged vacation or tour with preset travel components (e.g., flights and hotels)
- 8%
- 13%
- 11%
- 3%
- 8%

Legend:
- Overall
- Gen Z (18-23)
- Millennial (24-39)
- Gen X (40-55)
- Boomers (56-74)

Question: When purchasing travel components (e.g., airline tickets, paid lodging, car rental, rail tickets) for your [ ] leisure trip(s) in the last 12 months, how did you purchase them? Select all that apply.

Base: U.S. travelers (N=2,074)

Source: *U.S. Consumer Travel Report 2020*

Figure 2 - Travel Component Booking by Age in Europe

Legend: ■ Individually ■ Dynamic Package (OTA Bundle) ■ Prepackaged vacation ■ Escorted tour

France:
- 18-34: 84%, 13%, 12%, 2%
- 35-54: 77%, 14%, 15%, 4%
- 55+: 71%, 15%, 18%, 10%

Germany:
- 18-34: 80%, 19%, 19%, 1%
- 35-54: 70%, 21%, 23%, 2%
- 55+: 72%, 17%, 24%, 9%

U.K.:
- 18-34: 80%, 23%, 12%, 2%
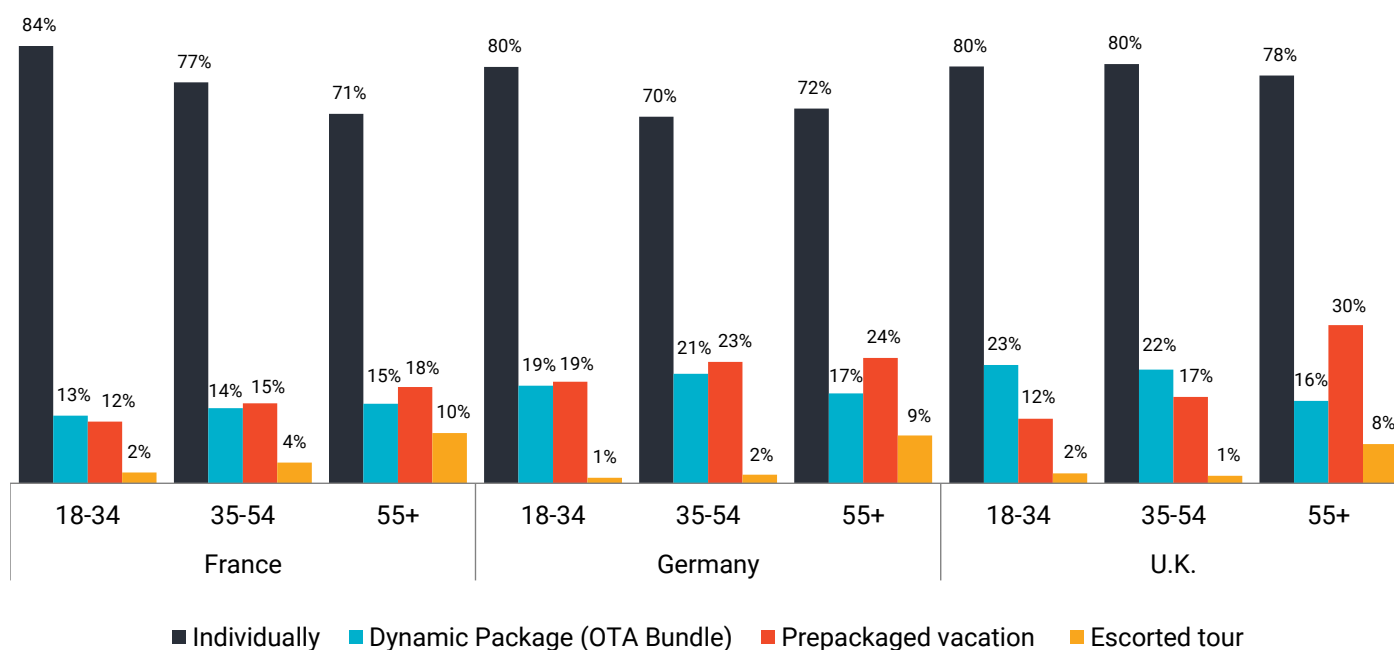- 35-54: 80%, 22%, 17%, 1%
- 55+: 78%, 16%, 30%, 8%

Question: When purchasing travel components (e.g., airline tickets, paid lodging, car rental, rail tickets) for your leisure trip(s) in the last 12 months, how did you purchase them? Select all that apply.
Base: French travelers (N=1,024); German travelers (N=1,114); U.K. travelers (N=1,006)
Source: *Europe Consumer Travel 2018*

How does caching address online-consumer needs?

Regarding **inspiration**, besides being a natural choice for natural language and voice search, caches provide the best answer since with a minimum of preselected criteria, customers can reach matching suggestions. Customers are always looking for the "best deal" offering flexibility to toggle between alternative dates provides them with a more informed choice and the ability to compare price options. Combined with instant filtering this customization process allows them to select their holiday based on alternative travel dates, meal bases, hotel ratings and facilities to meet their budgets and satisfy their desire for getting the "best deal" available.

On **personalization**, not only can the customer drill down with filters and preferences, but caching allows them to go a step further since the OTAs and tour operators now have insights about which are the best options to offer them as top results. Travel suppliers know their customers well enough so they can put the most suitable deals displayed at the top. Inferring on search data (the type of holiday, the number of parties etc.) and other information such as the IP address location, and used in correlation with a CRM, caches will allow OTAs and tour operators to suggest the most suitable search results leading to a conversion. For example, if the search criteria relate to a family client profile involving several parties, the top 10 search results displayed will be the closest to the desired search. It prioritizes the top 10 results among the bestselling deals for the same searches.

Improve customer experience, conversion and market share. Harness the power of the latest cache technology.

Undeniably, besides supporting the customers' need for customization, it is also a great marketing opportunity for the platform to be able to influence the search results. As summarized by Paul Nixon,

> *"the fewer criteria specified by the customer, the greater the marketing opportunity for the OTAs and tour operators"*.

Speed is a crucial UX component and the main reason why caching has been developed. As many studies agree[4], above three seconds loading time, pages lose around 53% of mobile users. On the same, Amazon has lost 1% of sales for every 100ms of delay. As a consequence, Google strives to load search results in less than one second and penalizes pages loading in more than two seconds.

Matthew Abbott highlighted in a recent blog post about Intuitive's holiday cache product[5] that

> *"DealFinder can search through hundreds of millions of results, in under 300 milliseconds"*.

Also, as a cache is an obvious choice for natural language and voice search.

---

4 "How Page Load Speed Affects Customer Behavior", June 2020, Business.com and "The psychology of web performance", June 2018, Uptrends.com blog post.

5 "Introducing DealFinder – instant search and filtering for holiday packages", December 2020, Matthew Abbott, Intuitive Blog

Challenges of building, maintaining, and using a cache

The initial investment

Before even starting to build a cache, it is important to mention that the initial investment might be a challenge. Hardware, infrastructure and knowhow resources involve a significant investment and it takes time to develop a performing (accurate) and fast cache.

It explains why only a limited number of online operators (mostly being the largest ones) invested in in-house cache solutions.

Building a cache

The benefits of caching are established, however, building, maintaining, and using a cache comes with some challenges and trade-offs.

In regards to building a cache, **the first and main issue is to collect the data from the various travel suppliers.** bed banks, flight aggregators, airlines (GDS) and hotels contracted directly, and other sources often provide data in various cache formats which are not standardized. In a nutshell, there are three types of formats:

- Full contract push: the detailed underlying contract data is pushed by the supplier and all cost permutations are rebuilt by the cache provider.

- Cache price files: the data can be sent in a file with all combinations by the supplier to the cache technology directly

- The cache provider scans the supplier's system to build the cache on their behalf.

It, therefore, involves the transformation of a great amount of data in a format supporting very fast searching. Cloud technology offers great opportunities in this regard as Matthew Abbott explained:

> *"Using cloud technologies such as AWS Lambda, we can optimize the process, allowing us to build a cache of one billion costs in less than two hours, and to build caches in parallel with serving requests, allowing for constant uptime for the OTA / tour operator, whilst a new cache is being provisioned."*

Maintaining and using a cache

Live searches take time however results are always up to date. A fresh direct query is done to all suppliers for each customer search; therefore, all changes (flights or hotels availability, margin updates) are taken into consideration. On the other hand, since caches work as pre-calculated databases they might lead to variations (live vs. cache).

To address these variations and guarantee data accuracy and recency, Intuitive came up with an innovative approach, including health checks and supporting incremental updates throughout the day.

At the end of each cache build, pricing and availability tests for each supplier are run to check the cache and take immediate corrective actions if required. Paul Nixon detailed:

> *"We ensure DealFinder data quality and accuracy thanks to five key activities. We start with self-certification during the development process. Then, we do frequent intraday updates (either full or incremental builds). These intraday updates focus on flight data updates; however, we also make margin updates throughout the day. Finally, we run auto self-certifications after each cache build".*

Figure 3 – DealFinder cache updates

- Overnight build with full data import and cache refresh
- Previous cache stored in case of critical issues
- Low-latency supplier cost updates available during the day
- Bedbanks typically "once per day"
- Flight typically "twice per day"
- "Live" sync with reservation system if required

Day 1   **Day 2**

Live → Standby

Standby → Live

Search

Supplier's live system ↔ **Healthcheck** ←
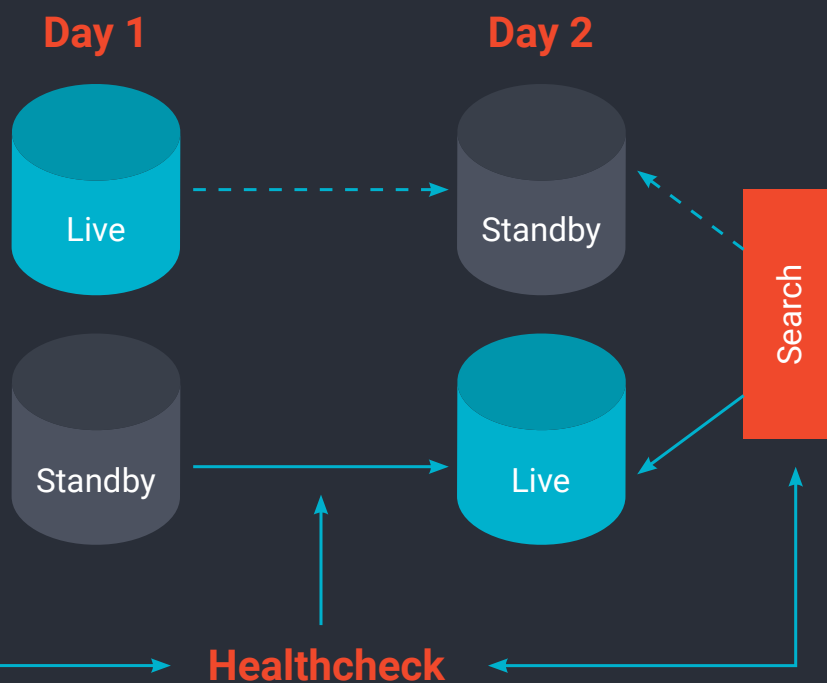
Assessing the need for a cache solution

Evaluating the UX performance

Speed impacts positively the trust in the brand and the look-to-book ratio since customers have no tolerance for pages perceived as slow-loading. They expect instant results and failing to do so will negatively impact the stickiness of the customer.

There are few areas to look at to analyze the current performance of an OTA or tour operator's website, to assess the need for utilizing a cache driven primary search, a good starting point is certainly to review the customer-journey-related metrics: the exit pages, the conversion from the landing page to the search form, and ultimately to the purchase of a trip.

To go further, it would make sense to check if previously identified customers' needs are met. Does the platform allow them to perform broad searches ("any destination / any departure")? Can customers search by theme? Can results be refined thanks to filters so the customer can find their ideal holiday?

Then, are the best possible search results displayed for that specific customer? Are the suggested top 10 search results displayed converting? This is crucial since people only buy what is put in front of them so it has a direct impact on conversion. As highlighted by Paul, Intuitive's co-founder and managing director, customers interact with DealFinder filters, converting without pressing on "more results". The initial selection which prioritizes the top 10 results among the bestselling deals for the same searches, suits them.

Benchmarking the back-end performance

In order to ensure the OTA or tour operator aren't losing customers due to speed, assessing and benchmarking speed is therefore key, and often the reason for moving from live to cached-search solutions. Mercury Holidays had an in-house cache solution which was returning results in eight seconds. For their new website, they used Intuitive's cache solution for their primary flight and hotel search and reduced that to less than a second.

Besides, it is interesting to evaluate the supply since it has an impact on speed and the offering.

- An increasing number of suppliers might result in increased complexity of the supply chains, while customers are looking for a fast, broad and easy search tool.

- On the other hand, a wide variety of choices is needed so appealing offers are suggested to customers.

As part of the assessment, OTAs and tour operators need to evaluate how many suppliers are integrated and distributed. Also, how many dynamic package combinations are the OTA or tour operator selling?

"Reducing the time it takes to deliver holiday search results to our customers from an average of eight seconds to less than a second creates a significantly better user experience. Coupled with the ability to search for multiple destinations and an entire month at a time makes the holiday discovery process quicker, more enjoyable, and virtually frictionless; ultimately increasing the likelihood of conversion. Having Intuitive handling the heavy-lifting of importing and packaging millions of cached prices has dramatically reduced the developer and infrastructure resources required to deliver and manage this on an ongoing basis. The DealFinder API itself is easy to work with and well documented which makes the integration process that much smoother."

Tom Bugeja
CEO of Mercury Holidays

Quick self-assessment

- ☐ What is the conversion from the landing page?
- ☐ What is the conversion from the search form?
- ☐ Does the platform allow customers to perform broad / open searches ("any destination / any departure")?
- ☐ Can customers search by theme?
- ☐ Do we offer a calendar view for customers to toggle between dates?
- ☐ Do our filters allow the customers to personalise their results?
- ☐ If filters are used, are holidays resorted instantly?
- ☐ Are customers interacting with these filters?
- ☐ Are customers using the "More results" option?

- ☐ Is the speed < 1 second?
- ☐ Are we offering all our key destinations and properties?
- ☐ Are we maximizing sort profiles to optimize the bestselling properties within the first 10 results?
- ☐ Are we building a cache that contains all our available properties?
- ☐ What is the cache miss percentage?
- ☐ How often are caches updated?
- ☐ What accuracy-related health checks are performed?
- ☐ What is the cost variation percentage?

Data accuracy should no longer be a reason for staying on live search since it is now possible to have a cache providing both speed and accuracy. Data accuracy results from the cache updates frequency and materializes in pricing discrepancies with the live data. It is therefore an important factor to consider when in the process of choosing a cache solution. There are three elements to consider when assessing the metrics of building a cache, cache-misses[1], cost variations and price tolerance.

- Cache-misses: following the successful cache data import, the results (total number of flights and properties) imported in the current build are compared to the previous day ones to ensure there are no significant differences.

- Cost variations: as part of the final build process, suppliers (flight and hotel) costs imported are compared to the live API. Variation percentage is measured and investigated where appropriate. Currently, Intuitive is experiencing above 95% accuracy (i.e., less than 1% difference between cache and live data).

- Price tolerance: the OTA or tour operator sets it either as a percentage or fixed amount to absorb any price fluctuations between search (cache data) and live pricing when the customers click to proceed in the booking process.

Of course, it is important to highlight that the ultimate accuracy factor is the quality of the data collected from the supplier.

---

1   A cache miss is an event in which a search result is not found in cache memory. If the data is however found in the main database, it is stored in the cache for future reference. A successful data retrieve from a cache is referred to as cache-hit.

Improve customer experience, conversion and market share. Harness the power of the latest cache technology.

Improving OTA and tour operators' cache capabilities.

In the event the performance review has brought to the light need for improvement, it is urgent to take action since conversion and market share will be positively impacted as confirmed by Matthew Abbott:

> *"Once the OTA has a great cache, it can achieve amazing UI with super-fast responses, broad/inspirational searches, and filtering. In other words, the OTA or tour operator allowing the broadest cache with the fastest and most intelligent search, in most cost-effectively way, will have the biggest (commercial) advantage".*

Unfortunately, while major e-commerce sites have great cache technology, currently, in the travel industry, most of the OTAs and tour operators are still working with live search. **The solution to moving promptly and effectively to cache technology could therefore be to outsource, relying on experts.**

For the few OTAs and tour operators already on cache technology, the benchmarking exercise might have still highlighted some need for improvement. It is then crucial to improve the existing cache capabilities:

• In the event accuracy issues were identified, solutions to improve the frequency of data import and solutions to increase the fidelity of data import have to be implemented (increase the frequency of data import from once a day to several times a day, auto self-certification during the development process and after each cache build, etc.).

• If speed issues are identified, storing flight and hotel

costs in separate database tables then combining them "on the fly" with pricing rules when a search is generated will dramatically reduce the response times. By adopting this approach, cache updates throughout the day require less time: only costs that have changed since the last import are updated.

• In case the infrastructure and hardware needs were too high, smart caching would be a solution. There is no need to rebuild a full cache: targeted, intelligent caching so you're only rebuilding the prices that are most important or most likely to be volatile.

Change technology can appear overwhelming, however outsourcing is a solution. In Paul Nixon's opinion, "getting functional performance is straightforward, however, getting the very best out of the technologies is key, and going beyond in-house teams may yield better results".

For example, DealFinder builds caches with a unique approach addressing these issues:

• It builds caches in less than 2h when it often requires 12 to 18h.

• Also, updates are small and fast to avoid a (too) high computational burden.

• Lastly with smart caching, cost updates from suppliers can be achieved without delay throughout the day without waiting for the next scheduled overnight cache build.

Changing or outsourcing travel cache technology

Supplier's data access

Further deciding to replace or outsource the cache technology, the first step is to list the various suppliers to commence a validation of their existing cache capabilities and preferred solution for accessing this data.

Normally, even if it is the first time that an OTA or a tour operator requests a supplier to provide data for caches, there are a number of solutions available. As the Intuitive team highlighted, their cache technology is agnostic to the reservation system of choice and besides supporting standardized import format, they have "out of the box support" for several third-party data formats.

The required data to build the cache includes credentials used to access the platform, the supplier products, rates and availability data, and the agreed supplier import frequency.

In some instances, accessing the data might involve import costs from the supplier's side which would need to be taken into consideration by the OTA or tour operator.

Mapping data and user interface integration

Once the data files are imported, supporting metadata is stored which will be used to map and build the final holiday price. This information will include, airports, regions, resorts, property facilities and pricing rules.

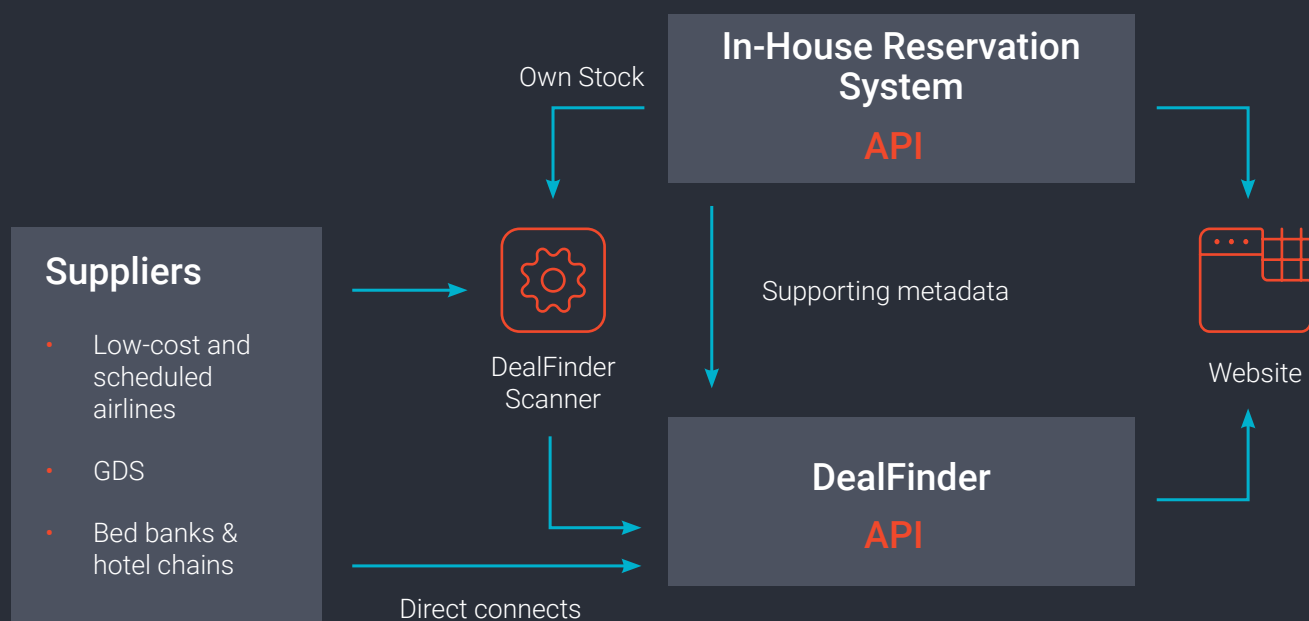Then, the process of the new API integration can take place.

> "When we began developing a new Thomas Cook platform, we knew customers would prioritize speed and simplicity. Working with Intuitive has enabled us to deliver a quick and easy search function as well as connect our various components in less than five months."

Peter Yip
Chief technology officer at Thomas Cook

Improve customer experience, conversion and market share. Harness the power of the latest cache technology.

Figure 4 - UI with DealFinder Caching solution

In-House Reservation System
API

Own Stock

Suppliers

- Low-cost and scheduled airlines
- GDS
- Bed banks & hotel chains

DealFinder Scanner

Supporting metadata

DealFinder
API

Website

Direct connects

Supporting metadata includes: Hotels, airports, routes, margins, profiles, meal bases, facilities
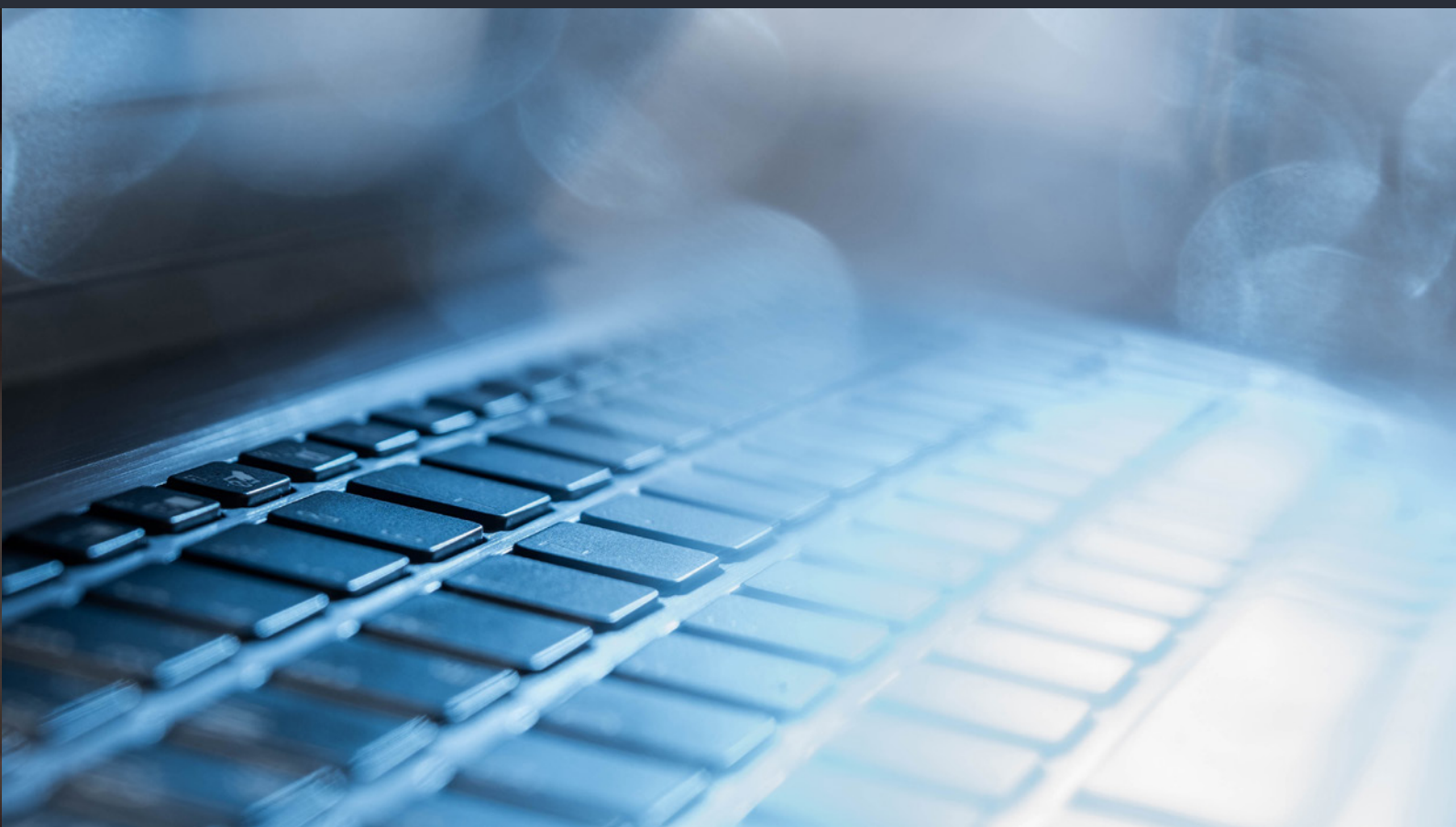
Conclusion: Caching in the coming years

Dynamic packaging represents a fantastic opportunity for OTAs and tour operators in many markets. Cache allows them to immediately respond to customer buying trends and market changes with availability and cost fluctuations. By remaining relevant and agile, customer experience will improve, increasing the conversion ratio and ultimately the OTA or tour operator market share.

Caching addresses consumer desires for speed, broad to narrow search approach, while giving the OTA or the tour operator the opportunity to inspire and recommend trips in the best possible manner. Cache technology ticks all the boxes, giving the customer flexibility to search (including with voice search) and filter results until they find their dream holiday.

It helps the OTAs and tour operators to manage the complex supplier relationships and data formats ensuring all content is available for the customer to search, even if today the multiple data import formats are a challenge. In fact, Paul Nixon predicts that in the coming years, widespread use of caches will certainly force suppliers to standardize their data formats to all parties' benefit.

DealFinder proves that challenges related to cache can be addressed. Firstly, accuracy is solved thanks to the scheduling of daily low-latency cache refreshes. Then, cache build times can be optimized with "smart caching" which allows scheduling of data imports to capture the latest costs from suppliers. Cloud-based cache solutions provide hardware and infrastructure efficiencies by offering horizontal scaling to meet increased website search traffic to maintain sub one second performance.

In fact, with the emergence of outsourced travel cache solutions, OTAs and tour operators now have a reliable alternative to the heavy and risky in-house option. Also, in Matthew Abbott's views,

> *"caches will become more pervasive, more intelligent and they will enable a new class of user experiences where speed is king and capabilities are wide."*

More OTAs and tour operators will therefore rightfully include cache technology in their digital transformation plans, and follow the steps of Mercury Holidays and Thomas Cook to improve conversion and gain market share.

Improve customer experience, conversion and market share. Harness the power of the latest cache technology.

PhocusWire

Powered by Phocuswright

About PhocusWire

PhocusWire is a comprehensive daily news companion for the industry, powered by Phocuswright, the most respected travel research authority and events brand in the world.

With an existing arsenal of deep, research-driven assets at its disposal, only PhocusWire provides daily exposure to sought-after research, valuable industry data and expert analysis.

Technology and distribution form the backbone of travel, tourism and hospitality, the planet's largest industry.

At PhocusWire we cover, analyze and debate the most important industry developments.

www.PhocusWire.com

intuitive

About Intuitive

Intuitive is a London-based travel technology solutions provider working with tour operators, online travel agents and wholesalers.

We partner with some of the most recognised and well-known brands in the travel industry delivering innovative and scalable solutions for end-to-end reservation platforms, direct contracting and 3rd party supplier connectivity.

DealFinder is a fully-managed, cloud-hosted caching solution that delivers the fastest and broadest search capabilities to reduce the speed it takes to return your holiday search results with average response times sub 300ms.

www.intuitivesystems.com