

The challenge

Events are big business. In the US alone, over \$24 billion is spent annually by 1.5 million exhibitors, reaching 80 million attendees at over 13,000 trade shows, conferences and expositions. Given the opportunities to build market presence, drive sales and gain market feedback, 99% of exhibitors still rely on their unique value (Center for Exhibition Industry Research).

Despite their importance evaluation is still largely based on subjective reporting and touchpoint measures using badge scanners and clicker counters. With so many stakeholders dependent on them; event owners, organisers and exhibitors desperately need a way to reliably evaluate their success.

Expo Analytics

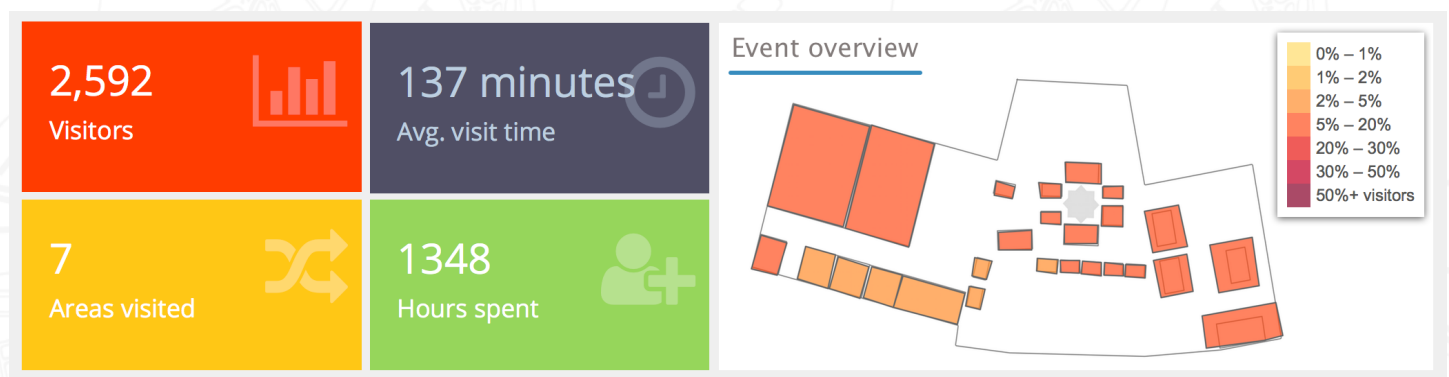


Fig. 1: Event overview

Expo Analytics is a plug-and-play addition to the venue Wi-Fi that provides visitor analytics to exhibitors, sponsors, event organisers and venue owners. Its detailed stand visit statistics, visitor flow analytics and premium location detection features help the venues attract and retain the best events and monetise their Wi-Fi investment, help the event organisers prove the ROI of attendance to the exhibitors, increase their rebooking rates and increase event revenue and help the exhibitors and sponsors to gauge the success of their event engagement strategy and optimise their event presence.

Since launch in August of 2015, Expo Analytics has been used by event organisers like Centaur and Microsoft and is being considered by some of the largest UK and European venues for inclusion in their service set.

Development

Expo Analytics initially developed analytics for the retail industry under the trading name Storesense, tracking millions of shoppers during 2015. During a meeting with employees of a large UK event organiser we became aware of the challenges in the event industry and the pressing need to start measuring and optimising clear performance indicators. We started developing the Expo in April and launched it in August of 2015.

Main objectives

While Wi-Fi is great for capturing movement without the need for visitor interaction, it has a few drawbacks: the visitors are anonymous, there are many Wi-Fi devices that are not worn by the visitors and the Wi-Fi location quality is far from optimal. Our main objective was to overcome the Wi-Fi limitations and use it as a data source to provide advanced analytics that provide concrete business value to our customers.

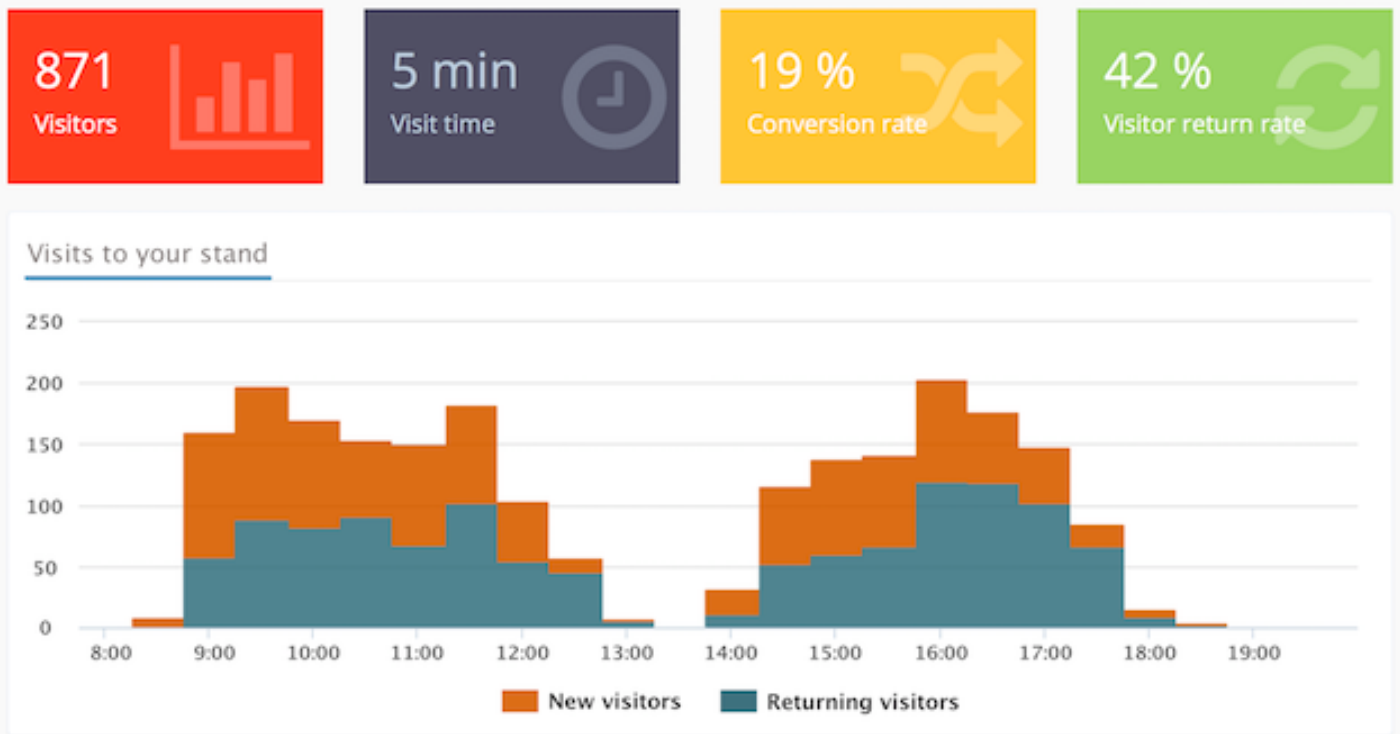


Fig. 2: Stand analytics overview

Value added services

We spoke with exhibitors, sponsors, event organisers and venues and defined the services they required:

Exhibitors: Track the number of visits to the stand, the time spent on stand, visitor distribution throughout the day and visitor return rates

Event organisers: Help prove the value of features to sponsors, prove the value of each location to exhibitors and help gain insights into visitor flows to optimise future event layouts

Venues: Provide additional services to event organisers and exhibitors and increase ROI from Wi-Fi infrastructure investments.

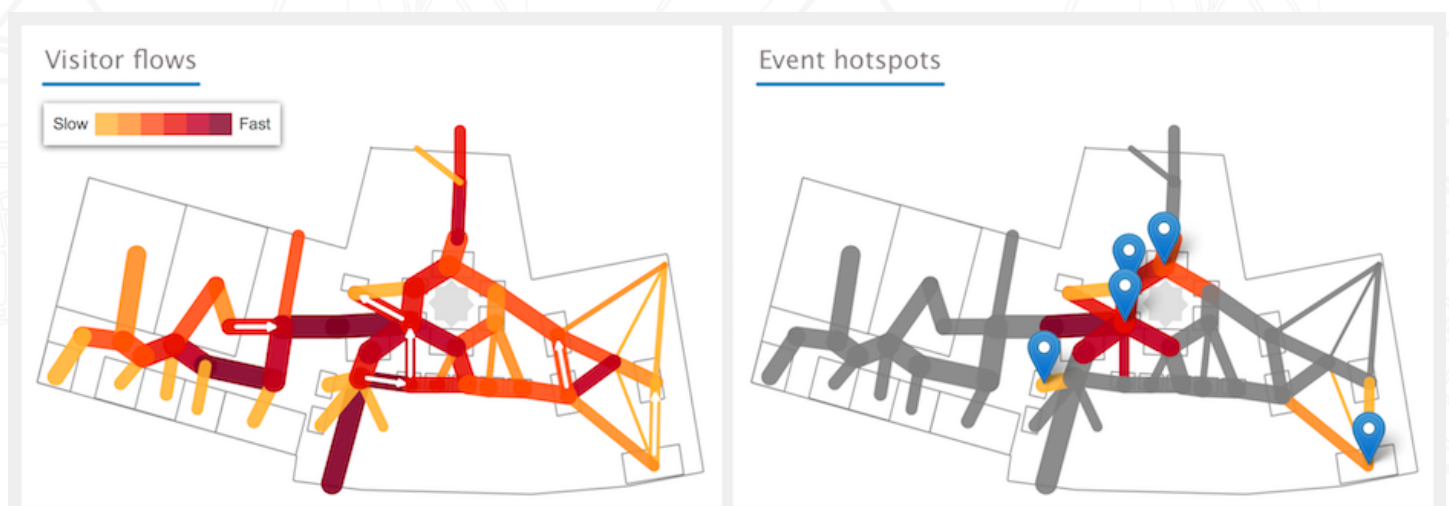
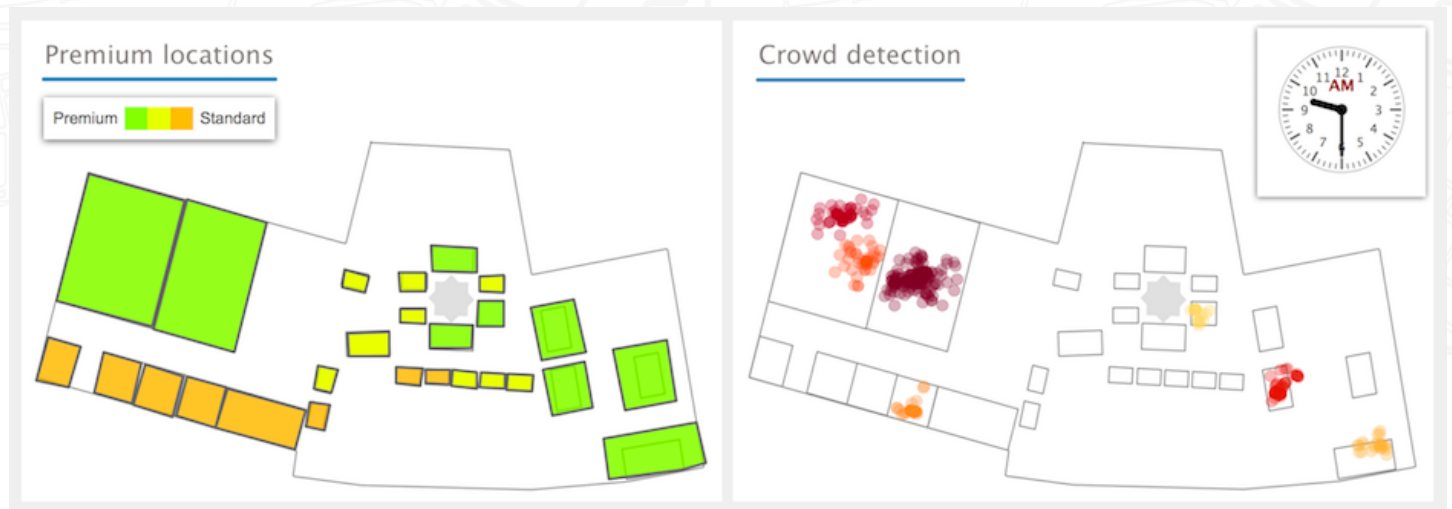


Fig. 3: Visitor flows



When we started developing Expo Analytics we discovered that the existing technology was insufficient for our purposes:

1. No location tracking solution assembled the detected visitor positions into paths
2. The venue layout was not taken into account
3. There were issues when a series of coordinates for a visitor began or ended abruptly
4. Wi-Fi location detection noise was not corrected, leading to very inaccurate detected visitor positions. The visitors would appear to teleport into the store or out, suddenly move a few meters and jump back, and walk through walls.

Path correction

Our initial vision for the service was simple: connect to a data source and use it to run analytics. However, as soon as we connected to actual Wi-Fi location data we discovered that it was too low-resolution for our needs. Once the coordinates were assembled into a path, the visitors would appear to teleport into the store or out, suddenly move a few meters and jump back, and walk through walls. We had to learn the typical Wi-Fi location noise to compensate for it, logically describe a store layout using a graph, determine the best way to fit a detected path to a graph and add potentially missing beginnings or end points.



Fig. 7: Conversion from raw detected visitor path to Expo Analytics corrected path

Visitor detection

The first feature we implemented was the counting of visitors. However, the customers' smartphones are not the only Wi-Fi enabled devices in the store - so are the laptops, badge scanners, other Wi-Fi access points, and similar. We had to develop a series of tests to distinguish the actual visitors from the devices and from the event staff, designing intelligent visit detection systems that adapt to a specific venue to accurately measure stand visits and take device movement, speed and visit time into account.

Big data

It goes without saying that the data sets we collect are extremely large. A medium sized event can generate millions of events daily. Our initial algorithms were more proof-of-concept; once we started working with actual customers we had to prepare an in-depth optimisation program that looked at each algorithm in turn and optimised it. As a result, we were able to shrink the average calculation time for a day at a medium event from 17 hours to 30 minutes.

Wi-Fi vendor support

We initially developed our solution for the Cisco hardware, taking its idiosyncrasies into account. When the time came to integrate other vendor solutions with our own, we discovered that they favour a variety of different reporting mechanisms. We had to build a special “middle-layer” that can now connect to different Wi-Fi vendors and even to Raspberry PI devices and presents the same logical interface to the rest of our analytics stack. To accomplish this we had to purchase network kits and determine the best way to connect to the data available and test it in live scenarios.

Results

We have prepared two case studies that showcase the results:

Festival of Marketing

“We were very happy with the detailed analytics Expo was able to provide us with. We know our sponsors will appreciate the level of insight as it will help them to prove the return on their investment. Expo Analytics has also provided us with insights into visitor flows which will help make the next Festival of Marketing even better.”

Bradley Cooper, Festival of Marketing, Centaur Media ([case study](#))

Business Travel Show

“Delivering ROI to the exhibitors is key to a successful event. Traditional measuring methods make it difficult as they are typically dependent on the exhibitors. With Expo delivering a complete event overview we could prove the value of event attendance and are in a great position to help the exhibitors receive even more value from the next event.”

Sam Cande, Group Commercial Director, Business Travel Show, Centaur ([case study](#))

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