The Internet of Shopping
How IoT Can Transform Shopping Malls
Introduction

There is a long list of elements that draw customers towards online shopping – ability to search (preference filters), dynamic personalisation, tailor-made deals, responsive user-interface, visibility and access to a diverse universe of products on a single web/mobile interface. Brick-and-mortar retail has been playing a catching up game owing to these differentiators which have enabled online-retail to offer a rich and personalised customer experience.

What if brick-and-mortar retail could imbibe most of these elements and still hold its own against online-retail through elements such as touch and feel, experience of a family outing, combining shopping with experiences such as eating-out, personal care, entertainment and a host of other real-world outdoor activities, which an online shopping portal cannot promise from the confines of a digital device.

The closest physical variant of a multi-category e-commerce portal is perhaps a shopping mall. Just like an e-commerce portal has multiple digital shop-fronts or brand pages, a mall has numerous physical brand stores. While e-commerce portals are trying hard to replicate real-world shopping experiences with digital tools such as virtual fitting rooms, they have not yet been able to match the instant gratification which physical stores provide in terms of touch and feel or try-then-buy. As a result managing returns is still one of the major pain-points e-commerce players struggle with.

Thanks to technology, online and offline retail no longer operate in isolation. Omni-channel as a retail buzzword has achieved a great degree of attention from both online and offline retailers. While online retailers have attempted to bundle the core online shopping experience with peripheral offline services such as same-day-delivery, click-and-pick etc; offline retailers have tried to launch their own online portals, giving the customers the flexibility to order the merchandise available at the outlets from the comfort of their homes. Thus, omni-channel so far has involved a major online play complimented by a supporting (minor) offline play.

What if offline retailers can turn the entire concept of omni-channel experience as it is defined today, on its head! The burgeoning Internet of Things (IoT) offers immense possibilities to do just that.

The following sections explore various ways in which connected devices help bring in the richness of online shopping experience in a pre-dominantly offline retail setup. While this paper has chosen a shopping mall setup as a case in point, most of the use-cases will be valid across any composite, multi-category shopping environment.
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Table 1: Benefits to various stakeholders in a connected shopping mall ecosystem

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<th>IoT Application areas</th>
<th>Targeted at</th>
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<td>Integration with Social Media</td>
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<td>People tracking and counting</td>
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<td>Enhancing Customer Life time value</td>
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<tr>
<td>Competitive intelligence</td>
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Customer Experience

Integrating offline features into online shopping

The ability to ‘search’ items across outlets in a mall or to get the ‘reverse-bids’ for an item from different retailers within the mall are some of the features that can enable digital-like experience within the physical premises of a shopping mall.

A connected ecosystem within a mall can bring the snapshot of the styles and designs available across outlets in a mall at the finger-tips of the shoppers. Just like they have the option to click through choices, search for their favorite items, specify style preferences and price range on an online shopping portal, they can do the same when in a connected mall. For instance, a shopper searching for a “size 42, green button-up shirt”, will get a search result comprising search results across shops having similar apparel. The shopper can then choose the ones she wants to go and see personally in the outlet.

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What’s more, these searches can be monetised by the mall owner – the retailers can be given a chance to make reverse-bids within the price range specified by the shopper. The mall owner makes money by allowing the retailers to bid, and then earns a commission on the deal that finally goes through.

Social Media Integration
Bringing social media to the real world

Social media strongly influences opinion, and our shopping choices are also heavily influenced by social preferences of those who we know and don’t know. Apparel and brands which have a higher number of Facebook likes are more likely to be sold. Stores that have a large number of followers on Facebook and Twitter have a proportionately higher number of physical walk-ins as well.

Figure 2: RFID enabled wrist-bands with Facebook’s like functionality

Figure 3: Real-time physical like counter placed in a store
The viral aspect of social media can be now brought to real world as well, thanks to IoT. Shoppers can use RFID enabled wrist-bands to like stores and items inside them by simply flashing their bands in front of them. The idea is to link a person’s Facebook Id with a device in that person’s possession and then enable the functionalities such as Like, Share in the real world through the device.

Even easier is to implement physical counters for Like and other social media statistics (number of tweets, shares, followers etc). The intent is to bring in the same adrenaline that is generated through increasing number of followers, tweets and online interactions about a brand or a business to the real world. Companies such as Smiirl and Flapit have their entire business model based around selling such physical social media counters.

People Tracking and Counting
One shoe fits all – The perfect solution

Tracking and counting people within a crowded mall can provide valuable inputs for its security force. It can also enable accurate conversion tracking while serving as a trigger to spot customers in distress or those who need assistance in any form.

Security: Security automation through intelligent video surveillance offers a reliable solution for monitoring crowded public places. Automatic analysis of crowd flow such as a sudden rush of people towards or away from a particular spot, spotting movements such as running, several people walking in a non-authorised direction etc. can be valuable preventative triggers for an alert security team. Digital signs in the mall can be used to communicate common messages, triggered automatically, based on emergency conditions across the premises.
**Conversion Tracking:** People-counting is no longer limited to traditional approaches such as using beam-break sensors. Advanced video analytics enable not only the means to count individuals but also through proximity and cluster analysis, comment with high certainty on which groups of people represent a single sales opportunity. Shopper-group counting is critical to get an accurate assessment of conversion rates for retail stores, as mere head-counting is likely to result in distorted figures. The technology can also be utilised to monitor the impact of in-store promotions, changes made in store layout and other events that may affect the spatial movement of customers.

**Customer Assistance:** Tracking tools are helpful while tracking customers who are in distress (such as those needing immediate medical attention) or who are simply lost in the vast premises of a shopping complex. The time spent by a person or a group of persons in and around a particular spot can be a useful indicator to segregate potential candidates who might need attention/assistance. Advanced video analytics can also spot through gait, body-types and other physical characteristics – senior citizens or children without any adults in close proximity, who may need assistance.

**Maximising Customer Value**

**Retaining customers and increasing ticket sizes**

A connected mall can develop a set of evolved smart analytics that can create personalised deals and offers for the customers, building in much needed customer loyalty and increasing the likelihood of them making a purchase.

For example, as soon as a customer parks their car in the parking lot of a mall, they get personalised notifications for designs from their favorite designers available in 3 outlets today; another notification mentions that the footwear store now has the size that fits them, for the shoes she tried on last time; yet another lures her to a restaurant at the food-court that is offering happy hour rates to her, if she places the order in the next 5 minutes!

All this is possible as the connected ecosystem of the mall now enables data aggregation and analysis at the mall level. The data is no longer confined to individual ERP modules of the retailer outlets and a richer analysis is now possible by mixing and matching customer preferences across outlets. Re-targeting and re-marketing are not new to e-commerce portals. They have for long been sending personalised offers to customers based on the pages visited on their shopping websites. When similar tactics are implemented in a physical universe of a mall, the likelihood of a conversion is much higher – as the customer is in physical proximity of the source of the offer, the moment of truth hits them more powerfully than an email-coupon would have.
Integrated Ordering and Payments
Generating a network of interlinked transactions

A connected mall is an opportunity for different outlets to leverage the network effect caused by other outlets in the mall. This opportunity manifests itself in the form of an integrated ordering and payments ecosystem that not only is a winning proposition for the retailers but also is a customer delight.

A customer shopping at a fashion outlet in a mall can redeem the points gained at the Italian restaurant on the floor above or the points accumulated through monthly grocery purchases at the mall can be used at the electronics store to buy the latest headphones! These are some examples of what an integrated payments experience may look like. Such seamless integration of ordering and payments will be an attraction for customers and an opportunity to cross-sell at an inter-retailer level. A popular retail brand will be able to charge a premium, monetising its awareness, to associate with an outlet that has recently opened and wants to have a payments-points arrangement with the popular retail brand.

Competitive Intelligence
Data generated will be a source of intelligence

The multitude of customer interactions taking place in a connected mall will generate data that will be a rich source of intelligence for players within and outside the mall.

The data generated inside a connected mall will effectively offer a snapshot of customer preferences across categories ranging from fashion, food, personal care to electronics and entertainment, and will have a premium attached to it. The data will offer rich insights into prevailing preferences, promotion design and effectiveness, new product development etc. The utility of the data will not be confined to retailers within the mall and the data will be of use to a wide spectrum of retailers focused on aligning their offerings with customer preferences.

Utilities for Aggregated Demand
Connecting people with common demands

The seamlessly connected ecosystem within a mall will not only enable retailer to customer connectivity but also connect the customers with each other. These customers placed in a common environment will be able generate a pool of aggregated demands and will look for solutions that economically meet those demands.
What are some of the ways shoppers at a mall can benefit from being connected with each other? People like to know if one of their close friends is also at the mall at the same time, a connected mall app can let Facebook friends or those in the contact lists marked as ‘Friends’/‘Family’, know that they are inside the same mall. Another efficient use of connecting customers can be car-pooling when leaving from the mall, people aiming to go in the same direction can quickly connect in person at the mall before hiring a cab. Customers can also use such connected interfaces to share their reviews/feedback about outlets in the mall.

Conclusion

The possibilities that IoT enables for a physical retail setup are endless. The Internet acts as a catalytic medium connecting the retailers and customers into a single ecosystem. The connected ecosystem through various applications serves one or more of the stakeholders – the mall owners, the retailers and the end-customers. The online world of social media can also be brought alive within the physical premises, blurring the boundaries between the two worlds. The brick-and-mortar retail environment transforms into a hybrid network of people and devices which has most of the attributes of online shopping experience with the flexibility that can only be experienced by being physically present in the store. As more and more devices get connected, this transformation is only going to accelerate and completely change the nature of retail as we know it today.