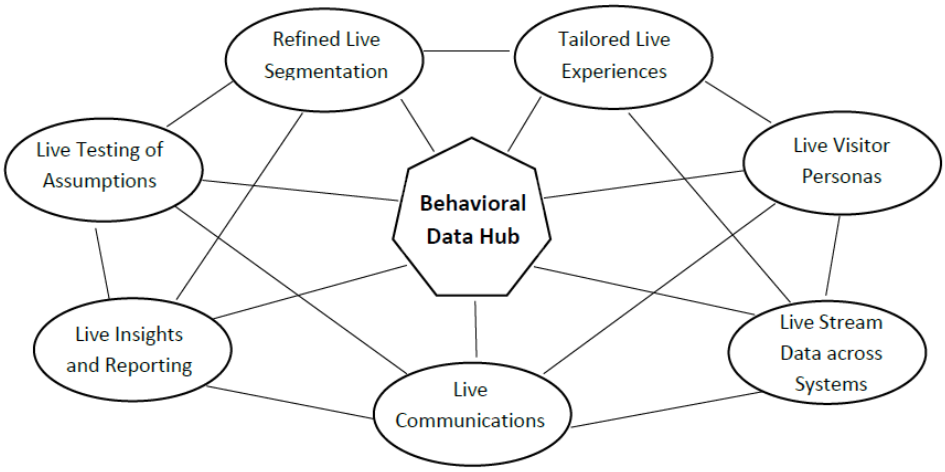
FANPLAYR WHITEPAPER

The Digital Last Mile in E-Commerce:

The Fanplayr Behavioral Data Hub



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1. From Research Project to Life Changer

In the 1960s, US government-funded research into building robust, resilient computer networks led to what came to be called the Internet. In 1989, the World Wide Web added a system of linking and sharing information over this super network, as a tool to benefit humanity. Then the graphical web browser made the Web user-friendly, and there followed a rush of innovation perhaps unparalleled in human history.

The innovation tidal wave was propelled by motives that were no longer rooted in idealism, but instead in what Adam Smith, in *The Wealth of Nations*, described as "a certain propensity in human nature … to truck, barter and exchange one thing for another."[1] We will soon mark the silver anniversary of what has been viewed as the beginning of these activities in the new digital world: the birth of e-commerce with the Netscape IPO. E-commerce is an elastic term, and can mean different things to different people. It obviously includes online retailing, digital music subscription services, financial services, travel websites, and many more activities where consumers and businesses purchase products or services from sellers, whether individuals or companies. But it also includes activities where individuals pay for something, typically digitized information (news, music, videos), with their attention, their personal information, or both. It includes financial services of all kinds: payments, transfers, monitoring of balances, asset management, information gathering, and more. And it includes the digital ecosystem that has been invented to make rich information delivery and seamless interaction possible.

To call this digital ecosystem life-changing is no exaggeration.[2] People from every country and at every income level browse, search, interact, and transact over the Internet or its digital

cousins, the wireless telecom networks. Education, matchmaking, job seeking and investing all occur in this new digital world. In some cases, there is an important physical component: the delivery of a product or showing up at the office when you are hired, but sometimes digitization takes over completely, such as in taking an online class, or making financial transactions. Even when the delivery of physical products is essential, the power of digitization has driven a profound change in the economy, what is increasingly termed a "retail apocalypse:" the closing of brick and mortar stores or the demise of entire retail chains. Products increasingly go from the warehouse to the customer's house, without ever sitting in a physical retail store. In another example, travel agents in physical offices have almost disappeared, as travel services can be offered and purchased digitally, even though the actual travel remains palpably corporeal.

What is the essence of the restructuring taking place? Information that was earlier gathered, shared or transmitted in a variety of ways is now all managed in the digital world. And this digital world has become incredibly complex, not just in terms of what customers and potential customers see, but in terms of the hidden infrastructure that makes every view, every action, and every interaction possible. This complexity is heightened by the richness of that data that can be used in managing the activities that take place in the new digital world, the variety of transactional arrangements that can be implemented, and the unprecedented scope of what can be done digitally. This paper argues that the rush of innovation and the complexity of the e-commerce ecosystem have produced an unevenness of development, and even a neglect of that most important last mile, when a potential buyer or client is digitally exploring and interacting with a seller or service provider. For the core of e-commerce, all the driving of traffic, monetization of eyeballs, and explosion of content are useless if this digital last mile is poorly handled.[3]

The next section describes the changes in retailing wrought by digitization and the new possibilities for interacting and transacting via the internet. It draws on Singh (2017), which argued that both textbook models and practitioners were not paying enough attention to the digital last mile of online retailing, the customer conversion stage. But it goes on to show how

this perspective extends to a range of services that either occur, or are guided and managed, online, in areas such as travel and financial services.

Section 3 drills down from the conceptual frameworks of Section 2 to the practical challenges of e-commerce websites. For example, data has to be rich but relevant, this data then has to lead in real time to productive classifications of website visitors, and in turn this process has to create productive action options for visitors. There are feedback loops and further complexities in all this, encapsulated in the idea of what Fanplayr, a pioneer of this approach, has called a ***Behavioral Data Hub***.[4] The concrete outcome of this focused system of software is, to use Fanplayr's description, to ***"make behavioral data actionable in real time."*** [5] This section also provides concrete illustrations of Behavioral Data Hubs in action for several sectors (retailing, travel and hospitality, telecoms and utilities, and banking and insurance).

Section 4 concludes this paper by pulling back to the broader challenges of the new digital world. The flood of data and lack of clarity in how it is accessed and used have hindered productivity and raised privacy concerns. One can make the case that the approach encapsulated in the ***Behavioral Data Hub*** provides greater precision in the capture and use of data, increasing productivity as well as reducing privacy concerns, creating a virtuous triad for e-commerce.

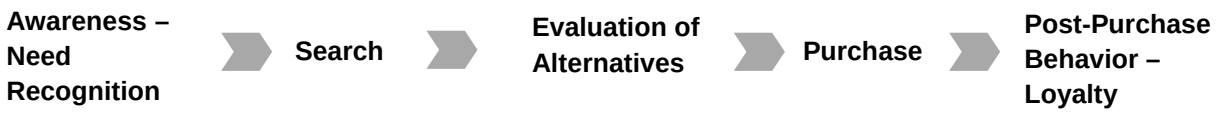
2. Models of Online Retailing and Beyond

What was thought of as modern retailing – before the advent of the Internet and Web – evolved in the 20th century through continuous refinement of a basic model of supply chain logistics, physical displays, and mass advertising, all revolving around the retail brand. Retailers took advantage of economies of scale and scope, just as manufacturers did thanks to the industrial, or factory, revolution. Online retailing disrupted this situation of seemingly sophisticated efficiency, in ways that only slowly became apparent. One after the other, large retail chains have succumbed to the pressure, particularly from the omnivorous maw of

Amazon.com, which has taken scale and scope to levels unimaginable before the creation of e-commerce. This is the retail apocalypse that is hitting the headlines now.[6]

There are two aspects of this momentous change. One is the more visible reconfiguring of physical spaces and business value chains, leading to emptying malls and thriving logistics firms. The other is the more nuanced change in customer interactions with sellers. Analysts have been scrambling to adapt post-World War II models of consumer behavior, which first drew on modern psychology, and later, neuroscience and behavioral economics, to provide guides for the conduct of online retailing.[7] The new models seek to capture the new reality of rich data and new forms of interaction, for crafting strategy to serve existing and potential customers and clients in the digital world.

Figure 1: The Consumer Decision Process



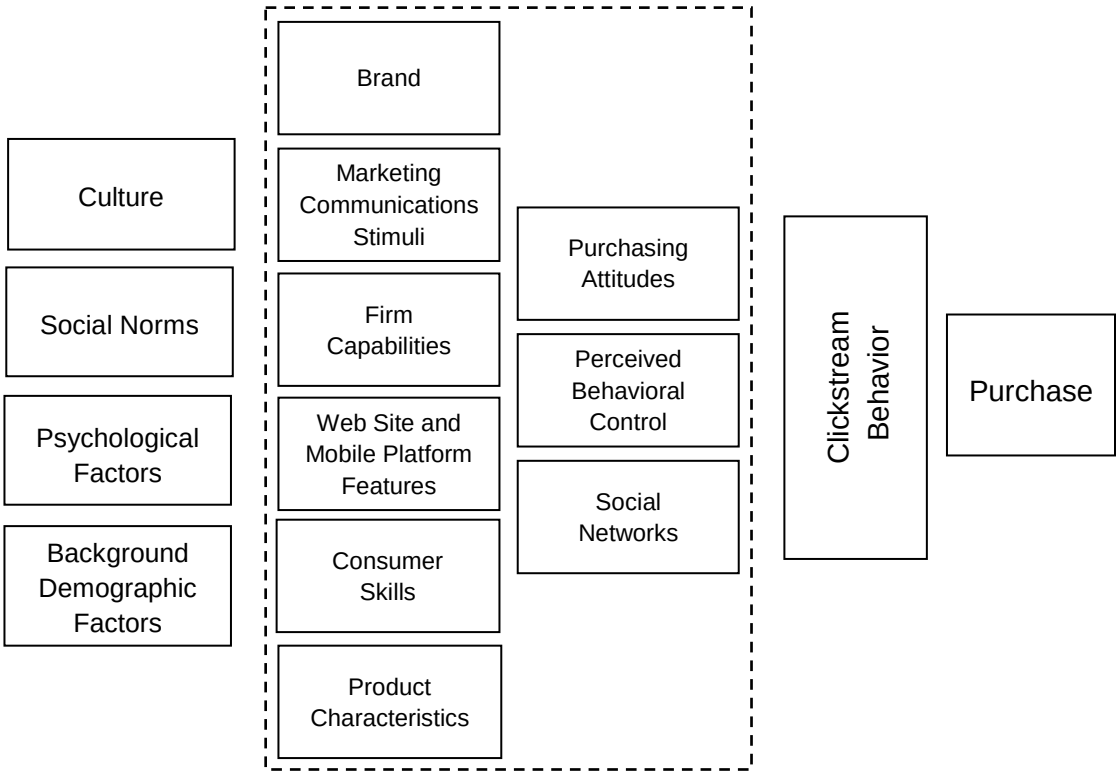
Source: Singh (2017), adapted from Laudon and Traver (2016)

Figure 1 is a five-stage "textbook" illustration of the consumer decision process, at a high enough level that it is not tied to any specific channel of investigation, interaction or transaction.[8] The chart itself is simple and self-explanatory, though one can elaborate on it in various ways.[9] The complexity of the online retailing environment has led to more elaborate schemas, as exemplified by another textbook representation (Figure 2), designed to capture the special features of the digital world.

The comprehensiveness of the representation in Figure 2 is useful, but it also carries the danger of losing focus. With so many variables and sources of data, the key aspects of the interaction with the customer (existing or potential) are relatively neglected. Physical retailers are realizing

this, to some extent. After a long period of cutting back service in the name of efficiency, to the point where store visitors could wander the premises aimlessly and helplessly, brick and mortar retailers are trying, with varying success, to pay attention to those who seek them out. It is ironic that online retailers, who can potentially do much better in this dimension, given the right digital tools, have been slow to do so.

Figure 2: A Textbook Model of Online Consumer Behavior

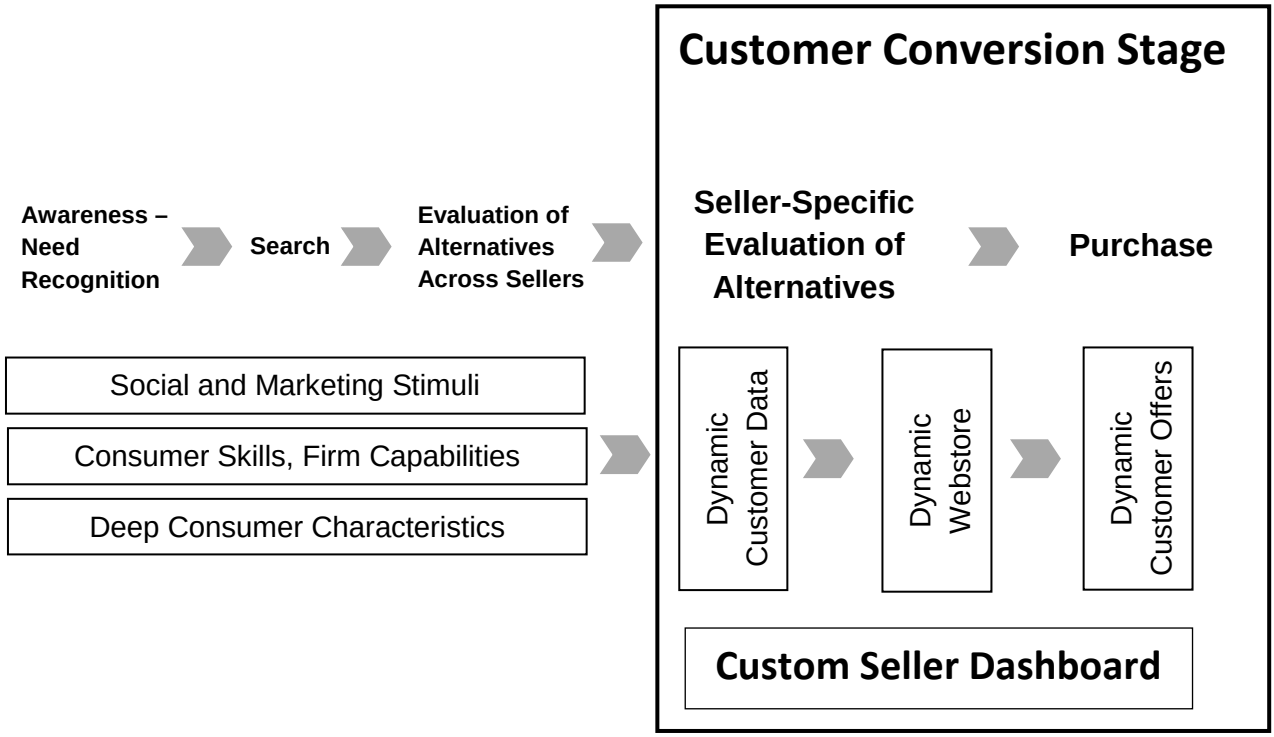


Source: Singh (2017), adapted from Laudon and Traver (2016)

It is important first to re-envision the consumer decision process. This is done in Figure 3 (introduced in Singh, 2017), which makes the last mile of that process, namely, the customer conversion stage, the focus of strategic attention. This representation combines elements of both textbook charts, recognizing the complex reality of consumer behavior in an information-rich environment, but with different emphasis and new highlights. In particular, this

representation acknowledges the importance of digital tools for dynamic responses within the digital last mile, summarized in the chart as a "Custom Seller Dashboard."[10]

Figure 3: Customer-Focused Online Retailing



Source: Singh (2017)

Figure 3 was developed in the context of retailing, but it applies to all e-commerce situations where there are two sides interacting. Consider a couple of examples. In many definitions of retailing, such as that of the US Department of Commerce, travel is not included, but treated as a separate category. In this case, physical services are being provided, possibly including different modes of transportation as well as lodging. Myriad bundling options and combinations are possible, and the services themselves have almost infinite scope for variation. The purchaser is still a customer, but the website is not a virtual store, in the sense of being a digital

analogue of a brick-and-mortar premises, but instead is a service location, replacing the travel agent as intermediary. The airport, airplane, car rental location and hotel still exist – only the process of planning and purchasing changes. This process is crucial but also complex, because the choices are complex. Ultimately, customer satisfaction will depend on the quality of service delivery (was the vacation fun?), but a well-crafted digital process can be vital in creating a service bundle that is more likely to lead to a satisfying final outcome. Furthermore, post-purchase interactions (featured in Figure 1 but omitted from the subsequent charts) can also be made more productive and satisfying.

Financial services provide another good example of the power of the perspective in Chart 3. In this case, visits to an ATM or a safe deposit box still require physical presence, but almost all financial services and transactions can be completely digitized, leading to a different kind of transformation than what retailing is experiencing. Bank branches are disappearing, and those that remain are being reconfigured. The physical location is needed for interactions where high-touch is needed, or where regulations kick in. A bank customer (or client, with a slightly different connotation) may be required to physically sign documents to open a particular kind of account, but there is also a matter of comfort and assurance in discussing options and procedures face-to-face. Where does an effective digital presence fit in? Many financial transactions are routine or automated. But when a customer or client, existing or potential, wants to initiate a process of doing something less routine, such as a reallocation of investments, the website must be up to the task of managing this, from initial information gathering to setting up an appointment at a physical location, if needed. Here one has the complexity of travel services, along with a need for comfort and reassurance. Vacations are fun, planning for retirement is fraught with anxiety.

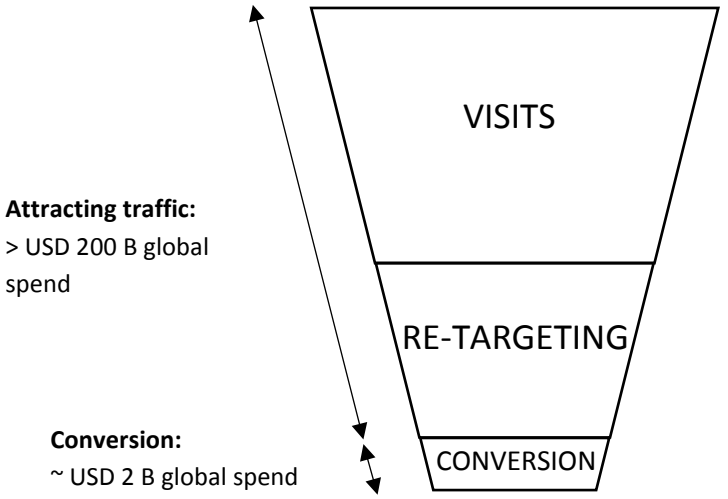
Financial services are also a good example of a category where relationship building and relationship management are supremely important. Other services, such as utilities, also involve ongoing relationships. Online retailers such as Amazon have also developed this focus, through loyalty and membership programs. In all these cases, the “Customer Conversion Stage” of Figure 3 expands in scope, to become a “Customer Conversion and Care Stage,” but the

central focus remains that of efficient dynamic responses to the consumer's wishes, with a "smart" website. How to achieve this is the topic of the next section.

3. Data – Analysis – Action

Now we drill down from the conceptual frameworks of the previous section to the practical challenges of e-commerce websites. Figure 4 concretizes the imbalance hinted at in Figure 2: it is a representation of a "conversion funnel," showing how online traffic is channeled to websites, in the fierce competition for eyeballs. Hundreds of billions of dollars are spent globally in attracting visitors, and trying to get them to return. But only a tiny fraction of that, as little as one percent, is spent on the digital last mile, on converting those visitors to customers or clients, or optimizing the value created for those already "converted," namely, existing customers or clients.

Figure 4: The Conversion Funnel



Source: Adapted from Fanplayr documents, 2019

The right hand portion of Figure 2, and the bottom of the conversion funnel in Figure 4, both illustrate how the crucial digital last mile for e-commerce is unwittingly reduced to relative insignificance in commonly used graphics. Unfortunately, this inattention has held back innovation for the customer conversion stage. Figure 3 visually corrects the imbalance, but what are the requisite details of making this conversion stage work better, for consumers and for providers of products and services?

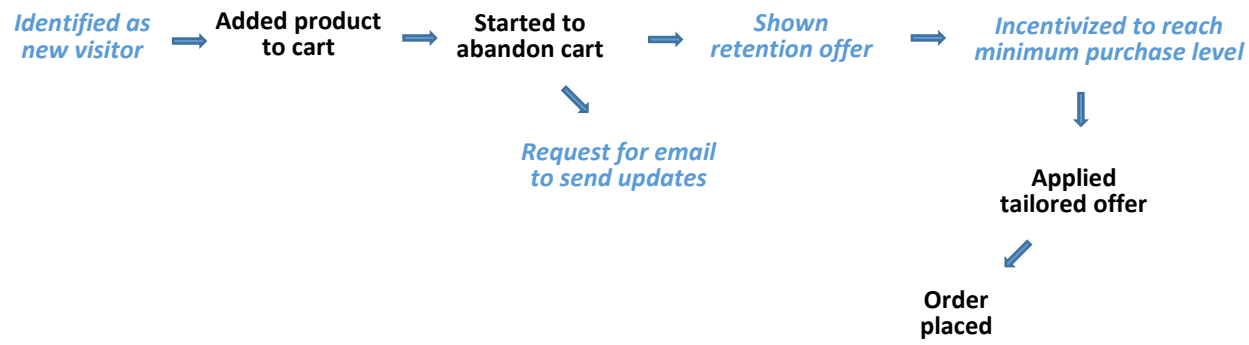
First, rich and relevant data has to be collected at the conversion stage. There are potentially hundreds of dimensions of data that can be valuable, including referring sites, previous visits, time spent on site, intervals between visits, browsing characteristics (such as speed, page views and exit intent), and interest in specific categories and products. Of course, the more data that is captured, the more one needs sophisticated, calibrated tools for making sense of it to guide responses from the provider.[11]

Second, the data has to lead, in real time – say in milliseconds –, to productive classifications of website visitors. This means refined segmentation based on the detailed behavioral data, rather than coarser, and likely less relevant, demographic data that is the focus of the approaches exemplified by Figures 2 and 4.

Third, the real-time segmentation has to lead to action options that are productive for visitors. A visitor who spends 15 minutes browsing all the different mobile phone plans on a telecom provider website might be offered a live chat to help make a satisfying decision. A first-time visitor to an online retailing site who has put two items in their cart but is moving the mouse toward closing the web page might be offered an instant discount for an immediate purchase.

Clearly, there are productive feedback loops between the different steps: accumulated data on responses to options in step 3 will guide models for segmentation and data collection in steps 1 and 2. This framework, built around a software system that Fanplayr calls a ***"Behavioral Data Hub,"*** permits careful, targeted experimentation and efficient learning, in ways that coarser methods, focusing too much on the earlier stages of the consumer decision process (Figure 1) or the maelstrom of the top of the conversion funnel (Figure 4), can never match.[12]

Figure 5: Intelligent Customer Conversion



Source: Adapted from Fanplayr documents, 2019

Figure 5 illustrates the customer conversion stage with a step-by-step example. Someone coming to an e-commerce site is identified as a first-time visitor. Intelligent software recognizes this in milliseconds, and begins the process of refined segmentation: this is indicated by the blue italic font. The visitor adds a product to their online cart, but then begins to abandon the potential purchase. These actions are monitored by the software, which is typical, but more significantly, tailored responses are triggered, based on the data assembled and analyzed up to that point. The visitor may simply be asked to provide an email address for the seller to send future updates, or, more actively, they may receive a real-time retention offer such as a 10 percent discount. If the resulting total falls short of a threshold to qualify for free shipping, a further real-time offer or suggestions may be made by the software. Finally, the dynamically tailored offer is applied and the order placed. The first-time visitor has become a customer.

Nothing about this process is easy. Conversion rates in such cases are low. But there is evidence that intelligent software that guides this stage of the consumer decision process can have significant impacts on these conversion rates. Increasing a conversion rate from 2% to 3%

represents a massive 50 percent gain for the seller. The key to this gain can be summed up in the goal, ***"make behavioral data actionable in real time."***

Figure 5 is just one illustration. Table 1 provides further examples, across several online verticals, of what can be accomplished with customized ***Behavioral Data Hubs*** for each vertical. Typically, these goals are pursued with software that is insufficiently rich and responsive, relying too much on static demographic data, rather than real-time, actionable behavioral data.[13] The table also shows how the "digital last mile" involves broader goals than just conversion, encompassing ongoing customer and client interactions, what we have termed "conversion and care" in the previous section.

Table 1: Behavioral Data Hub Goals

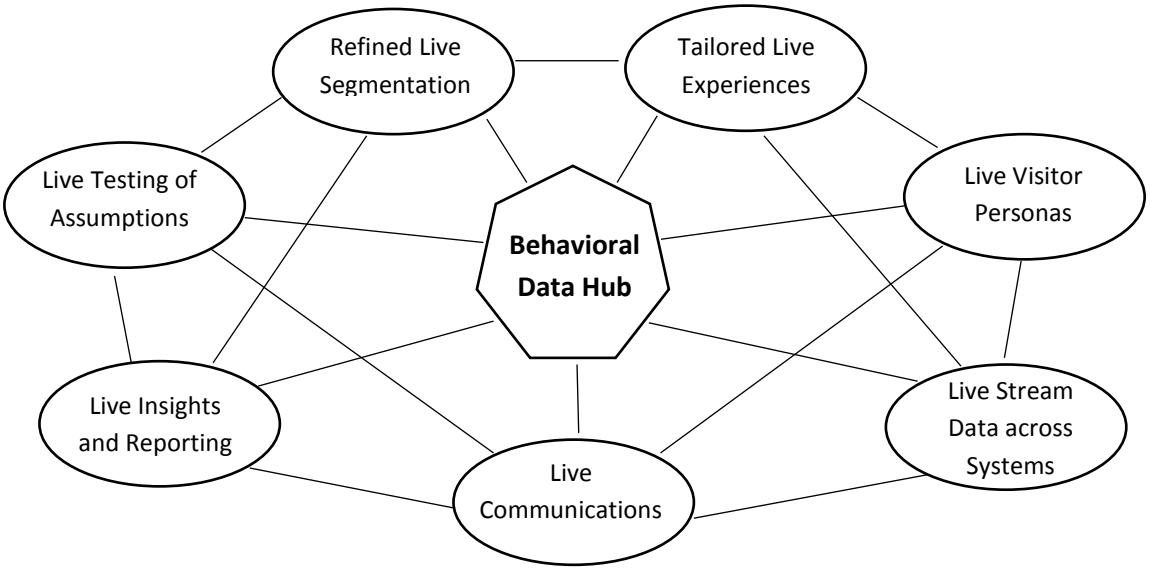
Retail	Travel & Hospitality	Telecom & Utilities	Banks & Insurance
Upsell and cross-sell	Push low occupancy routes	Reminders for limited time offers	Book appointments
Prevent cart abandonment	Manage reward programs	Lead collection	Target inactivity during form filling
Re-targeting	Upsell class of service	Customer service interaction	Lead collection
Newsletter subscriptions	Multi-player marketing partnerships	New offers	Customer service interaction
Recent purchase data	Flight status updates	Usage feedback	New offers

Source: Adapted from Fanplayr documents, 2019

It is also worthwhile to abstract from the examples in Figure 5 and Table 1, to provide an integrated visualization of the ***Behavioral Data Hub***. This is done in Figure 6, which combines

seven different aspects of this new approach to managing the customer conversion and care stage that was discussed and illustrated (Figure 3) in the previous section. This visualization pulls together the different concepts and examples discussed throughout this paper.

Figure 6: Fanplayr Behavioral Data Hub



Source: Adapted from Fanplayr documents, 2019

4. Conclusion: Precision, Productivity, Privacy

The life-changing tidal wave of digital innovation surrounding the internet has increased complexity and created a sometimes-confusing set of responses in the world of commerce. The retail apocalypse is one economic symptom of the resulting societal maelstrom, but it extends to a broad range of services provided to households, including telecoms, utilities, finance, travel and hospitality. This paper has argued that too much attention and too many dollars have focused on the earlier parts of the value delivery chain, rather than on the "digital last mile."

Tackling this new last mile problem requires focus and precision. The previous section illustrated what precision means in practice, in terms of real-time, actionable behavioral data delivered via a software system encapsulated in what Fanplayr has labeled a ***Behavioral Data Hub***.

The precision of these new, more focused digital solutions to the needs of buyers and sellers, clients and service providers, delivers on the promise of greater productivity that has often been unrealized up to now, in the rapidly evolving world of e-commerce. Productivity translates into shared tangible benefits, better returns on digital investments on one side of the market, and greater satisfaction on the other.

The precision of behavioral data hubs also addresses a looming problem for the digital world: that of individual privacy. European regulators have already begun to act on increasing concerns for the protection of demographic and personal characteristic data that fundamentally erodes privacy.[14] An approach that is based on more precise behavioral data, not necessarily tied to fundamental personal identities, delivers productive digital interactions and transactions with greater privacy protection. Such an approach is a better way forward for everyone.

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Appendix: Examples of Real-Time Actionable Behavioral Data[15]

Increasing Product Awareness

Highlight the chance to customize the product or service being purchased. For example, add custom patches to sneakers.

Customizing Navigation

Show visitors customized banners with specific copy or call-to-action based on users' behavior and history on the website in order to push them to do specific actions.

Making Targeted Offers

Interact only with users with a proven lower chance to convert by showing them the most relevant offer with the best timing according to your goals.

Enabling Smart Customer Service Interactions

Invite users to interact with the customer service or use live chats only when they seem to need help, for example after an error message or in case of an out of stock product.

Managing Abandonment

Retarget Site and Cart Abandoners with notifications related to products visited or in cart, inviting them to complete a purchase, even with a promotional incentive.

Prevent site abandonment inviting users to complete data entry and finalize the process.

Enhancing Customer Communications

Customize direct e-mails sending thanks to the data collected during user's navigation, such as pages or categories viewed or products added to abandoned carts.

Re-targeting feature that uses Fanplayr segmentation rules to personalize communications to users once they leave the site.

Endnotes

[1] This quote is from the first page of Chapter II of Smith's work, which was written in 1776 and is available in pdf format on the Web.
[2] An early analysis of this phenomenon was the book by Frances Cairncross of The Economist magazine (Cairncross, 1997).
[3] We use the term "digital last mile" to distinguish it from the "last mile" of fulfillment, which involves logistics for physical products, and a great variety of actions for digital products and for services.
[4] The source for this term is multiple Fanplayr documents. Related concepts and details can be found at fanplayr.com.
[5] Again, the source for this phrase is multiple Fanplayr documents.
[6] News stories have been highlighting the phenomenon and the phrase that describes it for several years now, as traced in a dedicated Wikipedia article (https://en.wikipedia.org/wiki/Retail_apocalypse) but there is no sign that the process is over: see Duprey (2019).
[7] For a simple illustration of these applications, see Ezra (2016). Important examples of the research behind this approach are Ariely (2010, 2016).
[8] Indeed, this model is taken from a leading textbook on e-commerce, Laudon and Traver (2016).
[9] For example, there may be a looping back and forth between search and evaluation. Or the search for alternatives may lead to a modification of the initial need recognition, or the triggering of additional needs. The evaluation of alternatives may end with the process being abandoned, without reaching the purchase stage. The fifth and final stage contains a complex set of actions that constitute post-purchase behavior, as well as the possible build-up of customer loyalty, affecting future iterations of the process.
[10] For a more detailed discussion of conceptual models of online consumer interactions with sellers, especially the "Customer Engagement Hub" proposed by Gartner Research, see Singh (2017).
[11] This is just one example, albeit a commercially vital one, of the challenge of navigating the overwhelming amount of data now potentially available. For example, an article on the data economy (The Economist, 2017) observes that, "Their abundance notwithstanding, flows of data are not a commodity: each stream of information is different, in terms of timeliness, for example, or how complete it may be." And, "The new economy is more about analysing rapid real-time flows of often unstructured data…"
[12] The Fanplayr Behavioral Data Hub can also be seen as a very specific example of data analytics, which as pithily put by The Economist (2019), converts raw data … into useful predictions … with the help of clever algorithms." According to that article, data analytics and artificial intelligence (AI, which is what can put the cleverness in the algorithms) may create $2.9 trillion in "business value" by 2021, with retail and logistics standing to gain the most.
[13] Further examples of the use of real-time behavioral data are in the Appendix.
[14] For example, see De Groot (2019) for a discussion. The European Union's own site (eugdpr.org) is very blunt about the changes, which will have global impacts, not just in Europe: "The EU General Data Protection Regulation (GDPR) is the most important change in data privacy regulation in 20 years. The regulation will fundamentally reshape the way in which data is handled across every sector, from healthcare to banking and beyond."
[15] These examples are based on Fanplayr documents.