

# The Internet of Things: Marketing's Opportunities and Challenges



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The Internet of Things (IoT) - devices and sensors connected to computing systems and networks - has received enormous attention in the last few years. The attention is due, in part, to the proliferation of connected devices, from about a million in the early 1990s to more than five billion today.<sup>1</sup> In addition, the technology for connecting the devices has become more affordable and easier to integrate.

The result is that IoT is helping to digitize more and more business processes, from the factory floor to tracking shipments across oceans. Digitized processes are providing a continuous stream of digital data. By analyzing the data stream, businesses can refine their processes by better understanding how those processes are performing, identifying possible issues sooner and uncovering areas for improvement.

While IoT is often applied to mechanical processes, it is also being used for processes related to consumers. Consumers are already tethered to the Internet via smartphones and other smart devices. And they will be even more connected in the next few years with increasing adoption of wearable devices and the introduction of self-driving cars. All these devices are providing continuous stream of data about the consumer from location to physical activity to consumption of media. This means marketers can apply IoT concepts and technologies to understand how consumers actually behave, identify when consumer loyalty falters and identify ways to improve the customer experience.

## Marketers' challenges

But while IoT provides unprecedented opportunities for marketers, it also provides significant challenges.

One challenge is working with vast volumes of IoT data. Most devices operate continuously and generate data 24/7. While a business unit may only need to deal with a fraction of the data, it still needs to filter the consumer data to identify situations or events that are relevant to the business and the consumer.

Another challenge is how to get a complete view of your customers. While IoT data can provide insights regarding a customer behavior, the insight is often limited to a subset of channels (such as web or mobile) or a specific type of behavior (such as web page views or location data). While these insights are valuable, they may be lacking information that is only available from other enterprise data sources (e.g., interactions in non-digital channels or customer profiles stored in a data warehouse). The problem is interacting with customers with incomplete data can result in either off-kilter interactions or missed opportunities.

The final challenge is providing a rapid response during a customer interaction. Speedy interactions are paramount in channels involving IoT. When customers are providing data in real time, the expectation is that responses are delivered in real time, too. For example, if a smartphone is providing the location of a customer, providing an offer minutes or hours after she left your store is an opportunity lost.

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<sup>1</sup> "Gartner Says 4.9 Billion Connected 'Things' Will Be in Use in 2015," Gartner, November 11, 2014.

## Using event-based marketing with IoT

So how can marketers use IoT to enhance customer experience? One way is by borrowing the event processing approaches from manufacturing processes.

Event processing analyzes streams of data from devices to identify key events and determines an action to address those events. For example, event processing is often applied to city traffic. Traffic cameras and monitoring data is continuously used to assess traffic, and look for significant slowdowns. These slowdowns are events that trigger actions to help alleviate traffic by changing traffic signal times or by providing rerouting traffic around tie-ups.

Event processing can also be applied to marketing. This type of marketing, called event-based marketing, can provide a framework to address the challenges of IoT driven marketing.

Event-based marketing identifies events in the customer life cycle that provide significant opportunities to interact with customers. Because the events often provide insight into a customer's current situation, it can offer opportunities for targeted and personalized marketing. Some events also indicate a customer willingness to consider new products and services, so the response rates are often higher than other forms of marketing.

Event-based marketing consists of two main steps. The first is to use data about the customer to identify significant events. The second step is to match the significant event and the customer's profile to determine an interaction that is the most relevant to the customer for that event.

This analytics approach for event-based marketing can be used to address the challenges of IoT-driven marketing. Instead of responding to every event, responding only to significant events reduces the burden on the organization. By only making decisions regarding customers with significant events, event-based marketing also provides a framework to use IoT data in real time.

## Event-based marketing solutions

SAS provides a two-part solution to unlock the benefits of event-based marketing.

The first is SAS® Event Stream Processing to help you analyze streaming data to make instant, accurate decisions. It continuously analyzes streaming data from various sources and can analyze millions of events per second.

SAS Event Stream Processing can be used to access IoT data streams to identify significant events. The solution can be configured to identify a single event from among the millions of events occurring each second. It can also be configured to identify patterns or more complex events that can be based on a series of events. The events can occur either simultaneously or over days or weeks.

The second is SAS® Real-Time Decision Manager, a decision-support solution designed to deliver the best real-time decisions. This solution combines predictive analytics with rules for the best decisions for a particular customer. Predictive analytics provides insight into customers' behavior, while a rules engine addresses business factors such as marketing considerations, eligibility rules and contact policy.

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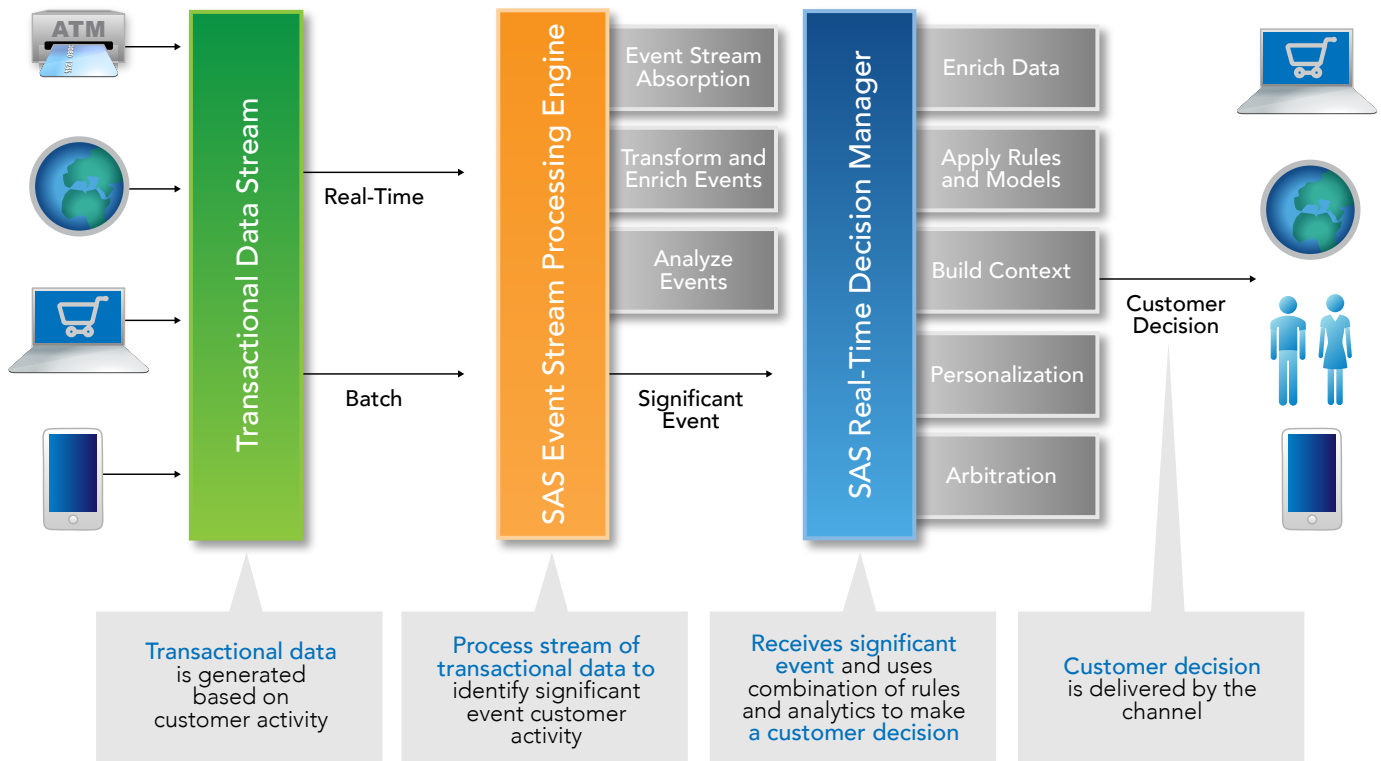
The significant event that has been identified by SAS Event Stream Processing can be sent to SAS Real-Time Decision Manager to trigger a real-time customer decision. SAS Real-Time Decision Manager can make customer decisions that are a combination of analytics and business rules. Although rules enable organizations to capture factors that are fundamental to making a decision, analytics can provide deeper insights for even better decisions. SAS Real-Time Decision Manager combines decision logic with analytics driven by the SAS®9 platform to develop a contextual understanding of the customer.

Combining these solutions provides the capability for event identification that triggers real-time customer decisions. SAS Real-Time Decision Manager can make a wide range of decisions. Financial institutions can configure the solutions to make financial decisions such as loan approvals based on customers' account activity and credit ratings.

Telecommunications firms can use SAS Real-Time Decision Manager to select a best action to take with a customer given her current context.

And retailers can configure the solution to determine the best offer to present to the customer as a cross-sell or up-sell opportunity. All these decisions can be sent to the appropriate channel (web, mobile or call center) that can also be selected via SAS Real-Time Decision Manager as part of the customer decision.

## Using Event Streaming and Real-Time Decision Manager Together



## Increasing revenue with event-based marketing

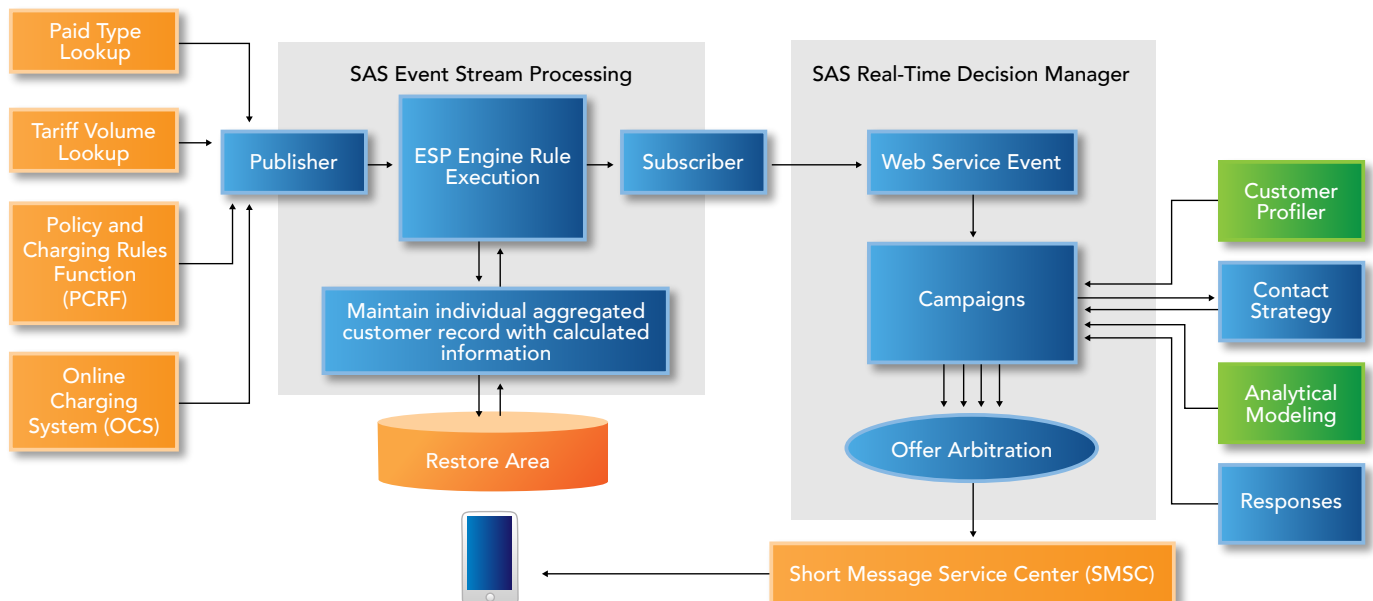
A European telecom had identified significant cross- and up-sell opportunities to customers with monthly data plans. For example, consumers typically reach their monthly data usage limit in the midst of consuming data (e.g., sending a large file). Because most consumers would like to consume data without interruptions or incurring high costs, these situations are significant opportunities to up-sell additional data.

The telecom first needed the ability to identify when consumers reach their data usage limit. When these events had been identified, they then needed the ability to evaluate the customer's current account and usage status and select a cross- or up-sell offer. Once the offer was identified, the telecom needed to deliver the offer in real time to the device used by the consumer.

The telecom implemented our solution that includes SAS Event Stream Processing and SAS Real-Time Decision Manager to address these challenges. SAS Event Stream Processing was configured to access consumers' device data usages from the firm's transactional processing systems. The solution was then configured to identify when a consumer with a data plan has exceeded their limit.

SAS Event Stream Processing was then integrated with SAS Real-Time Decision Manager to trigger a customer decision when the data limit event was identified. The decision triggered the retrieval of additional account and profile information, including responses to previous offers.

### Solution Overview —High-Level Architecture



The solution then applied rules and predictive analytics and determined the best offers for the consumer.

The decision also involves an arbitration process, where all offers that the consumer is eligible for are evaluated to consider the best offer given the consumer's current context. Once the best offer was selected, it was delivered in real time to the smartphone that the consumer was using via SMS.

Because the offers were timely and relevant, the telecom saw a significant increase in offer acceptance. The increase was significant enough to generate millions of euros in additional revenue. The offers also increased consumer satisfaction because they were timely and relevant.

## Conclusion

IoT brings significant opportunities for marketers by providing unprecedented insights into consumers' behavior. The insights could be used to create new revenue opportunities for a business and increase customers' satisfaction by providing relevant interactions. However, the challenge is to tame the flood of data to make the right customer decisions in a timely manner.

SAS Event Stream Processing with SAS Real-Time Decision Manager provides the framework to implement event-based marketing. The solutions provide the ability to identify the significant events associated with each consumer, and trigger real-time decisions based on the stage of the customer journey.

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