Enhancing Customer Service through the Internet of Things and Digital Data Streams

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Executive Summary

Organizations are facing a new IT era of low-cost, small electronic devices with sensing, communications and computing capabilities, commonly known as the “Internet of Things” (IoT). Changes driven by the IoT will likely be far more profound than those brought about by previous IT eras. In particular, the digital data streams (DDSs) generated by the widespread adoption of IoT devices will create opportunities to transform the business landscape. To deliver their value proposition, IoT devices need four capabilities deployed in concert: identifying, sensing, communicating and computing.

To harness the IoT and DDSs to business strategy, CIOs must focus not on technology, but on the business value potential of data generated in real time from DDSs. Previous work has identified five archetypes of value creation through DDSs: DDS Generation, DDS Aggregation, Service, Efficiency and Analytics. We contend that the DDSs stemming from the widespread adoption of the IoT can produce value in each of these areas. The full article describes how organizations can apply the Customer Service Life Cycle (CSLC) framework to harness the IoT to enhance customer experiences. The CSLC has four phases—Requirements, Acquisition, Ownership and Retirement, each of which is divided into several stages.

Using the Customer Service Life Cycle to Identify IoT Business Opportunities

The CSLC has been used in information systems research as a framework to understand customer service and strategic differentiation. However, its primary value is in guiding managers in envisioning new initiatives by providing examples of how they can use advanced IS at each stage, both to enhance the service offered and to create value. Using a slightly modified version of the CSLC, the full report describes and illustrates, with examples, new opportunities that open up at each of the 13 CSLC stages as organizations deploy IoT-enabled devices to enhance their products and services.

In the Requirements phase, a potential customer identifies new product and service needs. Attributes and characteristics of that offering are then specified according to customers’ preferences. There are two Phase 1 stages: establish requirements and specification. In the Acquisition phase, the customer decides where to buy the product, and how to order and pay for it; he then takes possession and tests its functionality. There are five stages in this phase: source selection, ordering, authorization and payment, acquisition, and testing and acceptance. In the Ownership phase, which has four stages: integration, usage-monitoring upgrading and maintain, the customer integrates the product with existing resources, monitors its use, modifies its characteristics when conditions change and repairs it if it malfunctions. In the Retirement phase, which has two
stages, the customer decides whether to replenish, replace, recycle or dispose of the product. There may also be an opportunity to account for the cost and expenses derived from its usage.

We analyzed 191 IoT initiatives, which were identified from public sources, and categorized them by CSLC phase and stage. Only two impacted all four phases, and only 19 had an impact on three phases. The bulk of the initiatives impacted only one (34%) or two (41%) phases. This finding is not surprising since the IoT functionalities built into products are often narrow and aimed at a specific customer need. The Ownership phase accounted for the bulk of the examples (73%), followed by Acquisition (41%), Requirements (22%) and Retirement (14%). 70% of the initiatives involved some type of usage monitoring. No other CSLC stage came anywhere near this. We also found that technology startups accounted for over two-thirds of the initiatives. The household durables and electronic equipment sectors were the biggest contributors of IoT initiatives, accounting for over a quarter of the total.

Lessons Learned

1. Create Direct Real-Time Customer Relationships. Historically, physical products were generally sold through intermediaries, and manufacturers found it almost impossible to provide any value after purchase or to learn from their customers’ experiences. However, when IoT sensors and connectivity augment physical products, manufactures can harness the digital data streams the devices create to produce customer value, thus facilitating direct customer relationships and loyalty.

2. Leverage IoT Digital Data Streams and Communities of Users. The identifying, sensing, communicating and computing characteristics of IoT devices allow physical products to become platforms for data generation. At each stage of the CSLC, a firm has the ability to provide value to existing customers. At the same time, it has the opportunity to generate data about its customers’ behavior. Organizations can then package and sell the data their devices generate.

3. Leverage Your Existing Competitive Position and Competencies. The CSLC can stimulate thinking about how industry incumbents with distinctive competencies or established value propositions can harness the IoT to leverage their competitive advantages. For example, a dominant player in packaging machinery has embedded sensors in its machines so it can gather relevant data for preventive maintenance. This company’s IoT initiative is predicated on, and leverages, its scale—one of the barriers that prevents the erosion of its competitive advantage.

4. Seamless Interoperability is a Prerequisite for Value Creation. Standards wars are common in the early development of innovations, but without interoperability or consolidation, the potential of the IoT is constrained. Ideally, smart IoT devices should be able to interact with each other and offer a seamless experience to users. Without such interoperability, customers have to acquire a plethora of different apps with limited functionality—an inconvenience that dissipates value.

5. Beware Reliability, Security and Privacy Traps. Reliability is a key concern for successful IoT initiatives. Because much of the computing power for IoT devices is cloud-based, IoT services face reliability issues that the physical products they are replacing did not have to contend with. Security problems are emerging as an even bigger concern and threaten to slow the adoption of IoT-enabled products and services. Many stories are emerging of hackers or security researchers taking control of IoT devices, including home lighting systems, thermostats, fire alarms and door locks. Privacy is another concern, particularly with IoT services that monitor the home via network connections and home security cameras.

In summary, the IoT promises companies an unprecedented opportunity to accelerate value creation and improve customer service. Nevertheless, exploiting the IoT’s potential is not an easy task due to the novelty of the phenomenon, security concerns and the disruptive changes it may bring in multiple industries. The full report provides managers with a framework (the CLSC) for stimulating creative thinking on how to exploit the opportunities offered by the IoT. The CSLC model provides managers with a tool for discovering where customer value can be created, thus enhancing the relationship with the customer.

Our research confirms that for many organizations, even innovative ones, the IoT may, at present, be more hype than reality. But firms are beginning to see through the hype and are creating new business models, customer value propositions and profits. The IoT is becoming, and will become over the next few years, as important, and as disruptive, as previous eras of IT innovation.