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Analytics-Of-Things Drives IoT Business Value: An Executive Perspective

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By Richard Hackathorn

Why should executives care about Internet-of-Things (IoT) applications in their companies? That is the question addressed by a study examining the business use cases for IoT applications by seven large companies, plus a city government. As shown in the table, they a potpourri of sizes and industries. In the detailed study, a vignette for each describes their business problem, solution involving IoT, and resulting benefits, along with an introduction to IoT technology.

Company	Use Cases
Vehicle Manufacturer	unnecessary maintenance, optional replacement, fleet management
Smart City	electrical consumption, transformer maintenance, grid balancing
Electronics Manufacturer	assembly line defective detection, reducing product returns
Gas/Electric Utility	peak period pricing, electric-vs-gas heating
Oil/Gas Producer	higher oil reservoir recovery
Railroad Company	steel wheel failure, scheduled maintenance
Paper Machine Manufacturer	process control, improved replacement parts, fleet management
Automobile Manufacturer	connected car, slippery road alert, zero fatal accidents

Lessons Learned

What are the lessons that executives can learned from this study? IoT is more than a fancy technology that improves a few business

processes. These companies created a variety of IoT use cases for reducing costs, increasing efficiency, improving customer service, and exploiting innovative business opportunities. These use cases impacted cross-organizational issues and exploited strategic opportunities, both requiring executive attention and action. The lessons learned are:

1. IoT value to your company depends on analytics

2. IoT value can be expanded incrementally from initial use cases

3. IoT value should flow from operational to strategic use cases

4. IoT value can be limited by technology assimilation within your company

5. IoT value requires investment in an essential infrastructure

Value Dependence on Analytics

Business value from IoT technology depends on the Analytics-of-Things (AoT), which is the integration, management and analytics of the IoT sensor data required to distill business insights. In the past, IoT generated a data stream of measurements that drove descriptive dashboards for operational control. Today, IoT business value comes from a holistic view of the business environment across time, locations and functions, along with business insights from predictive analytics.

The good news is many organizations have a data warehouse and analytic skills, implying that AoT is just focusing existing skills and tools at new sensor datasets. Further, recent advances have enabled the capture and curation of most sensor data into a low-cost data lake and to link this data into an integrated data warehouse, enabling innovative cross-organizational applications. Data analytics can now be applied to this integrated sensor data to extend beyond

operational efficiency into strategic planning.

Value Expansion from Use Cases

IoT can be like breeding rabbits – fun, easy and profitable! Once the infrastructure is established, the initial use case stimulates ideas and questions about product improvements and business opportunities. That leads to further analyses, more instrumentation, deeper questions, and new use cases. Executives can leverage a simple single-purpose IoT use case into a value-expansion enabler for:

- Refining the effectiveness of the initial use case (more accuracy, finer resolution)

- Expanding the use case to other operational issues (more applicability)

- Collaboration among functional units (more linkages around related processes)

- Introducing new data-centric services (new revenue opportunities)

Value Evolution from Operational to Strategic

Contrary to popular opinion, IoT is not applicable only at the operational layer. Long-term value impacts of IoT come from maturing operational IoT use cases into strategic AoT business initiatives. In other words, IoT use cases should evolve upward through the management levels, which requires executive leadership based on a strategic vision. For

example, the smart city has co-located the operations team optimizing hour-by-hour building consumption with the strategic team predicting long-term maintenance program.

Value Limitation by Technology Assimilation

As with the assimilation of any technology, organizational culture plays a critical role in its successful adoption. In particular, recommendations based on new IoT analytics are sometimes viewed suspiciously by established experts who have honed their skills over decades of experience. The challenge is to achieve a synergism that blends human and analytic expertise to achieve results that cannot be done separately.

Value Requirement for Infrastructure Essentials

Business value requires that a company mature from IoT operational use cases to AoT strategic initiatives, the essential drivers of which are shown in the figure.

Note the crucial role of AoT drivers, without which IoT use case is limited to a single-purpose application monitoring one business process. To unleash its value potential, an IoT infrastructure should support the following:

- Data Curation – Clean, organize, and archive raw sensor data into a data lake or refined data into an integrated data warehouse.

- Data Warehousing – Integrate data as a continuous effort to combine

subject areas into a cross-organizational data warehouse.

- Data Analytics – Establish benchmark trends, create operational/tactical dashboards, provide easy access to detailed data, govern standard test datasets, and apply predictive algorithms.

Recommendations

Executives should lead the adoption of IoT use cases based on a clear vision of business value, while avoiding technology for its own sake. They should challenge their companies to expand IoT use cases from single-purpose, to multi-purpose, across functional areas, and toward new value-added service offerings. The good news for realizing IoT business value is that AoT technology is rapidly improving and that existing IT infrastructure can be leveraged. Potential limitations are the lack of creativity to conceive of new innovations and the willingness to embrace those innovations.

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