

Jabil Software Services (JSS)

Embedded
Systems



Web &
Mobile



IoT



Cloud

Wireless
Networking

Wireline
Networking



CASE STUDY

Smart Packaging Auto Replenishment

JABIL

Customer Needs

Jabil's *Consumer Packaged Goods* sector manufactures a broad range of smart packaging solutions enabling automated ordering, improved consumer engagement and data-driven product innovation. Smart packaging solutions include embedded sensor technology used with foods, pharmaceuticals, and many other products to extend shelf life, monitor freshness, display quality information, improve safety and facilitate auto replenishment.

Consumer Packaging required the development of an IoT-enabled cloud-based management platform and mobile app to facilitate auto replenishment and other advanced features for smart packaging solutions. The solution enhances the consumer experience in purchasing, using and re-stocking consumable products (such as laundry detergent) whilst collecting actionable data to facilitate analytics, insights, and promotions for companies providing such consumer solutions.

The solution leverages components including:

- Embedded IoT-enabled sensors within the smart packaging solution, providing real-time data regarding consumption levels. E.g. Liquid levels.
- Communications between the IoT-enabled sensors and cloud-based services (leveraging Bluetooth® Low Energy technology and/or Wi-Fi).
- Mobile app for consumers, including features such as auto replenishment.
- Cloud-based services, including data analytics, remote configuration, and fulfillment services.
- Web dashboards providing streamlined interfaces to all cloud-based services.

Scope

JSS was engaged by Consumer Packaging to develop a cloud-based back-end and a mobile app for the smart packaging auto replenishment solution. The solution was tested leveraging an IoT-enabled liquid dispenser. The cloud-based back-end was developed on AWS, along with a fully web-enabled dashboard.

JSS dedicated a team of 9 staff to developing the Smart Packaging Auto Replenishment platform, including architects, cloud developers, mobile developers, and testers.

Deliverables

JSS provided the following key deliverables to Consumer Packaging:

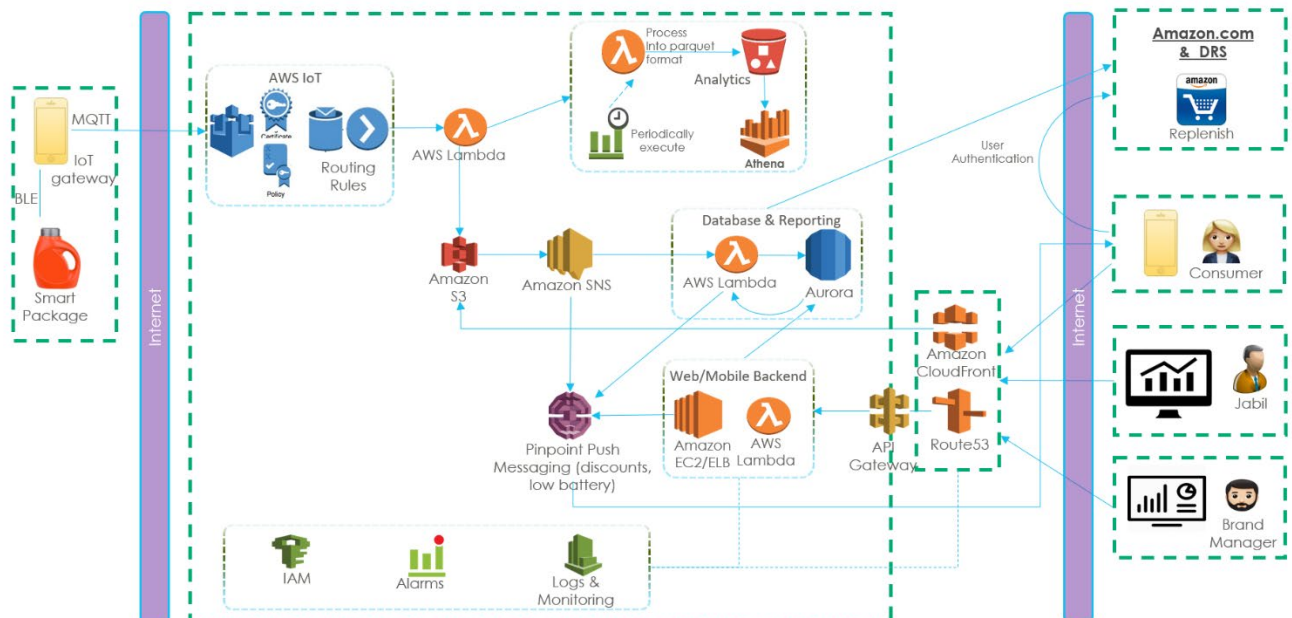
- Fully configurable cloud-application and web-enabled dashboards.
- Fully configurable mobile apps for iOS and Android, which double as IoT gateways facilitating cloud connectivity.
- Comprehensive documentation.

The Smart Packaging Auto Replenishment solution was developed by JSS leveraging an Agile methodology across several sprints over a 5-month period. JSS and Consumer Packaging clearly agreed scope and schedule expectations, and JSS leveraged a formal project management methodology to ensure efficient delivery.

The cloud-application leverages AWS, including IoT APIs, lambda functions, DB, and analytics. The web dashboards also leverage AWS with server-based JS.

The mobile apps were developed with Xamarin Forms to be fully cross-platform, leveraging Bluetooth® Low Energy technology and MQTT. They include features for user registration, device onboarding, device upgrading, the management of thousands of connected devices (maintaining the chain-of-trust from cloud to device), and customer specific branding. The mobile apps support connectivity via Bluetooth Low Energy technology/Wi-Fi, logging, and bi-directional event caching.

A block diagram of the architecture is shown below:





Strategic Value

The Smart Packaging Auto Replenishment platform provides the customers of Consumer Packaging with a curated, integrated, easily extensible and well supported platform for developing customized Smart Packaging solutions.

“Consumer Packaging is delighted with the development services provided by JSS. The commitment and hard work of the JSS team has contributed to the delivery of an advanced solution which meets and exceeds all of our requirements.”

Amanda Williams, Sr. Business Unit Manager

About Consumer Packaged Goods

Jabil's *Consumer Packaged Goods* sector manufactures a broad range of smart packaging solutions enabling automated ordering, improved consumer engagement and data-driven product innovation. Smart packaging solutions include embedded sensor technology used with foods, pharmaceuticals, and many other products to extend shelf life, monitor freshness, display quality information, improve safety and facilitate auto replenishment.

Consumer Packaging delivers an end-to-end smart packaging digital replenishment solution including bespoke packaging design, tools & molding, embedded electronics, firmware/software development, mobile application development, and data analytics.

About Jabil Software Services (JSS)

Jabil Software Services (JSS) delivers a broad range of advanced software services across several industries, leveraging an experienced team of architects, software developers and quality assurance engineers. JSS specializes in the efficient development of embedded systems, web & mobile apps, IoT solutions, cloud solutions, and networking solutions (wireless/wireline).