Case 4.2

Business Case: Carnival Seeks to Keep Passengers Happier at Sea with IoT, NFC, and Edge Computing

Two years after Carnival Corporation, introduced its OceanMedallion, a Star Trek-like communicator device, it has become an important part of the Princess Cruise experience and has significantly improved its passengers' satisfaction level. To date, OceanMedallion and its accompanying Internet of Things (IoT) architecture has been deployed on five Carnival's cruise ships. The Caribbean Princess, Regal Princess, Royal Princess, Crown Princess and Sky Princess. The Caribbean Princess was the first ship fully outfitted with the OceanMedallion but it's a lengthy process that involves not only technology but also MedallionClass service—a whole new service level tier needed to support the IoT model.

The OceanMedallion is about the size of a U.S. quarter. It connects customers with the ship's various services in a personalized way, regardless of where it is used on the vessel. The OceanMedallioin is mailed to the passenger prior to their arrival on the ship and they can wear it as a pendant, in a clip, on a sports band or on a bracelet. It's essentially a wearable IoT device that connects to Princess Cruises' shipboard sensor and data network. Its micro-antennae enable both Bluetooth and near-field communication (NFC) to communicate with various sensors, kiosks and other connective devices on Carnival MedallionClass ships and is touted to be waterproof, sunproof and sandproof. Unlike previous devices provided by the cruise company that included swipe cards, keys and other devices synced to individual ships' services, OceaMedallion connects to everything from the passenger's cabin door to all the games in the casino.

The MedallionClass component of the technology is an example of edge computing. Deployed sensors and mobile data collection devices on the ship perform their operations close to where the

data orginates and interacts rather than sending every transaction all the way to a centralized database in the cloud. This reduces latency. Speeds up data analytics, enables a wider range of customized smart devices and reduces network traffic. All of this adds to making the passenger happier Security is paramount, too. Each interaction with the OceanMedallion uses a two-factor authentication process (customer ID and the OceanMedallion ID). One example of all of this is when a passenger checks in to board the ship. When they tap their OceanMedallion on an NFC reader at a kiosk it verifies them based on both the token and their ID number. This proves their identity and helps speed up the boarding process, getting the passenger to their cabin faster.

By incorporating technology like OceanMedallion, Carnival has gone a long way to eliminate friction in the passenger experience while minimizing the obtrusiveness of technology. This way, John Padgett, Chief Experience and Innovation Officer at Carnal says, “guest can be freed up to enjoy the experience more and consume more experiences.” To enhance the passenger experience of even more of its guests, Carnival expects to deploy the OceanMedallion on six more ships in 2020.