Recent Trends in Embedded Systems: Specialization-IoT on Aircrafts.

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Abstract: **To realize IOT on aircrafts with recent trend examples and innovative ideas that might happen in future.**

I.   INTRODUCTION:

Machines will rule the world!Although not exactly as Hollywood proposes.
Today there is a strong movement towards the Internet of Things,where machines communicate with other machines communicate with other machines to improve our lives.CISCO estimates that there will be 50 billion internet-connected devices by 2020-more than six times in the world's population.Imagine all these devices connected in a very smart way,thinking and planning.Everything will be bigger,better,faster and cheaper than ever before.
Nowhere is this truer than in aviationindustry.**The Internet of Things promises a new vision of aviation operations and business models.**

II.   IOT OUTLINE

"An **IoT** system consists of sensors/devices which "talk" to the cloud through some kind of connectivity.Once the data gets to the cloud,software processes it and then might decide to perform an action,such as sending an alert or automatically adjusting the sensors/devices without the need for the user."
**IoT in aircrafts***: In commercial aviation comprises many segments-
transportation,businessaviation,freight,sport,personalaviati on,and self-controlled unmanned aircrafts in recent times.
IoT has the ability to enhance reliability,quality,customer satisfaction and fuel efficiency in an industry that is predicted to grow extensively in an industry that is predicted to grow extensively in the coming years.
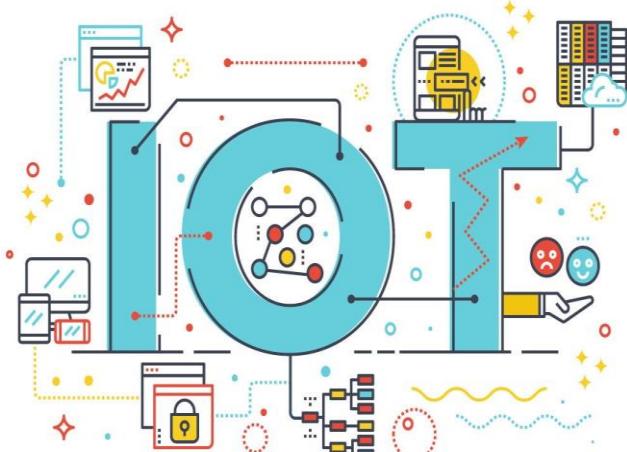
Aircraft maintenance,when aircraft has landed,the data can be taken as input and investigated.once we place IoT in the equation,data can be received in real-time by the maintenance staff on the ground rather than having to wait for the aircraft to touchdown.Maintenance troops will be ableto detect any issues and analyze them before the plane lands,thereby empowering them to ready with parts and engineers to get the issues resolved.by the time passengers claim necessitates the need for data collection.Consequently,fuel usage and emissions are reduced by a considerable amount,then engine performance proves significantly.

Rolls Royce recently collaborated with Microsoft to leverage IoT techniques in making their airplane engine 'brainy'endorsed Microsoft's Azure IoT Suite in order to determine probable faults in engines equipped with aircrafts in business around the globe.
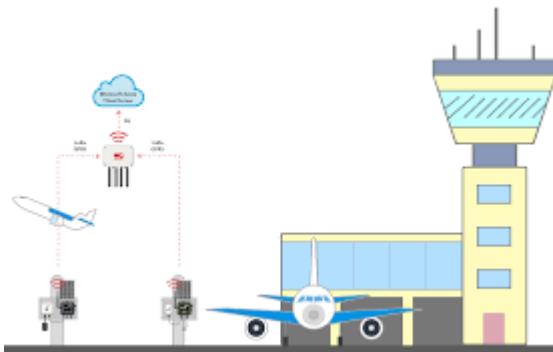
Similarly,some aircrafts such as the Helsinki Airport,LondonAirport,and Miami Airport as well as some airliners like Lufthansa Airlines,Qants,Delta and KLM have also commenced their IoT.

III.   RECENT REAL TIME EXAMPLES

Virgin Atlantic connected 787s: Virgin Atlantic is taking its use of IoT to new heights.Currently,the airline is producing a fleet of boeing 787 planes and cargo equipment connected via IoTdevices.The total data expexted to be produced over a flight will exceed a

Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Confcall - 2018 Conference Proceedings

staggering half a tetrabyte.Virgin Atlantic will have in real-time,Virgin Atlantic will have the information needed to recognize and solve a mechanical issue-before it even happens.

That equals safer flights,lessdelays,and an overall better customer experience.Things like high-fidelity IR arrays and UHF RFID will quickly prove data in physical stores is far better than online…once smart tech is at the helm.

JetBlue Automates Check-In: Any trip to the airport requires passengers to perform transactions that don't really add value to the travel experience.One of those activities is checking in.Realizingthis,JetBlue has put its technology into action;the airline has begun using IoT to automate the process.

After booking,customers are automatically issued a ticket and given a seat 24 hours before takeoff-without even having to log onto the app or website.The seat is choosen based on data about passengers preferences.
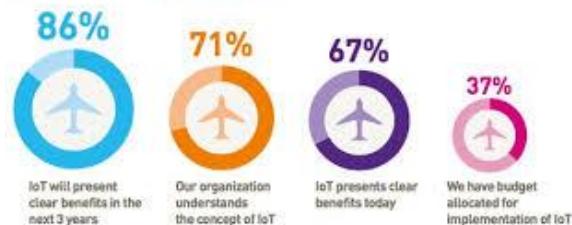
JetBlue makes it clear:withIoT,the airline has the ability to communicate across its systems and automate many aspects of air transport,liketicleting.Not only does this avoid problems if there is a flight delay caused by weather or mechanical eerrors,but also gives the airline the option to reallocate workers toward more critical operations.

IV.   INNOVATIVE IDEAS

"Some IoT devices do have the potential to swamp existing networks.Cameras send a lot of real-time rich data.New jet engines are laden with sensors and generate 10 gigabits per second when running,terabits per flight.Cars also are now recording massive amounts of information.If there's one part of the global IoT network that needs rapid upgrades to serve business,it'sthe"edge",the border between IoT devices and the computers on the Internet.The massive amounts of data being generated by the IoT need to be processed,reduced and analyzedbefore it hits the Internet.It's a big opportunity".

Challenges in IoT Technology-

"More and more IoTdevices,as well as a wider variety of devices,will enter the market that are IP enabled.In the short term this is going to create additional vulnerabilities and present challenges to security professionals across vastly enlarged attack surface everywhere from homes to enterprises to even automobiles.
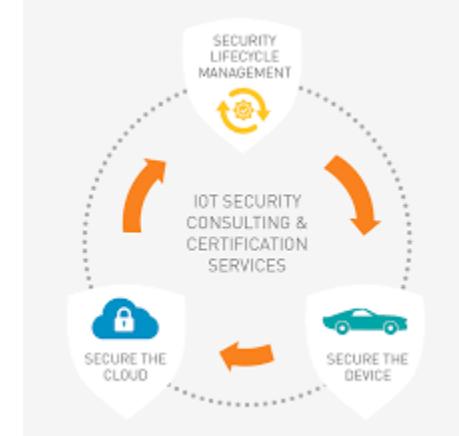
With higher value and higher consequences devices,like those found in an automobile,automakers will start to pay closer attention to security in a number of ways,from encrypting and securing control planes like CANbus-whick previously were assumed to be secured via obscurity-as well as wider use of OTA updates.Lower value devices,including IP cameras,routers among others,will eventually have more widely available updates,but these will be mostly manual,pullupdates.It is likely we will see more automated push updates may be made available later to help better secure a wide spectrum of consumer devices,at least to combat well known and documented threats".

V.   THE FUTURE OF IoT IN THE SKY

While IoT is not going to magically make airline travel a flawless experience,it can certainly make it more pleasant.IoT's capabilities are endless,and it's clear the Internet of things is going to transform the airline industry-and it's going to benefit both airlines and passengers.

Exactly what will be created and launched in the coming years remains to be seen,but what airlines are already doing is reason enough to be optimistic.The future of IoT in the sky is arriving,and it's looking quite nice.

REFERENCES:

Nick was the Senior Brand Journalist for Sabre from 2016 to 2017. He's covered the travel industry as a journalist and filmmaker for over 10 years. Prior to Sabre, Nick was AVP of Operations for Zomato, as well as reporter and global events lead for travel trade Tnooz. He's been an ongoing contributor to USA Today and his projects have been featured in Saveur, Travel + Leisure, Food + Wine, and APEX.

[1]   https://medium.com/iotforall/iot-explained-how-does-an-iot-system-actually-work-e90e2c435fe7
[2]   transforming aviation | World ... https://www.weforum.org ›
[3]   https://goo.gl/images/EBzovw
[4]   https://w3.accelya.com ›
[5]   https://www.hcltech.com
[6]   https://readwrite.com