



SAP
Innovation
Awards 2019



SAP Innovation Awards 2019 Entry Pitch Deck

Connected Battery-Powering India to the digital age!

Exide Industries Ltd

THE BEST RUN





<https://www.youtube.com/watch?v=g2PsGfB1dno>



Connected Battery

Exide Industries



“Quote”

“We would like to convert the perception of the Home UPS (Uninterrupted Power Supply) battery from a **dumb and most forget full device to a Smart Appliance**”

Mr. Gautam Chatterjee, MD& CEO – Exide Industries Ltd

“Even if the battery failure happens due to negligence of the customer, it’s the **manufacturer who gets the blame**”

Dr Dipak Senchoudhury- President R&D – Exide Industries Ltd

Explore newer business models of selling energy/power as a service rather than selling batteries

Mr. Subir Chakraborty- Director Automotive – Exide Industries Ltd

Challenge

We are incurring 2.3% of our annual revenue from Home UPS segment as warranty cost, which is a huge amount . Also with the increased competition in the market it is required to differentiate with the product offerings to retain and increase the market share

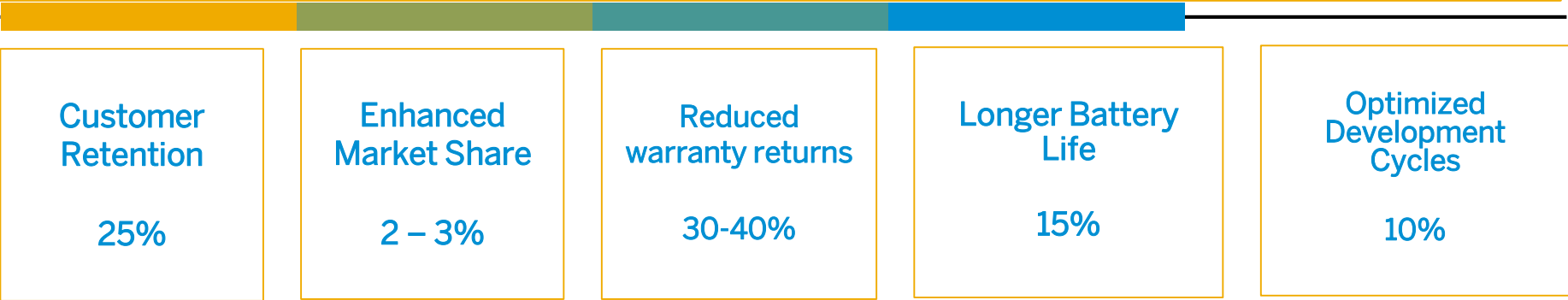
Solution

Make product smart by embedding sensors in the battery to monitor in real time the health of the battery and enable remote diagnosis and predictive maintenance to improve the battery revival rate , reduce warranty cost and improve Service Levels & Innovate with business model by offering power as service

Outcome

Offer better smarter product to **half a million customers every year** and provide with enhanced customer experience as in the existing Digital Economy “EXPERIENCE MATTERS”.

Reduction in warranty claims by 30-40 % and increased market share by 2-3%





Partner Information

SAP & Bosch

Change Agent, Trusted Advisor & Technology Provider



SAP team has led the entire engagement as a trusted advisors and experts in the area of business innovation. Their approach had been entirely on “Business Outcomes” right from the beginning and every aspect of the engagement was driven by adeptness. Whether it was winning confidence of business leaders with an outcome driven Design Thinking workshop or selection of System Integrator or the fundamental design of the solution, SAP has led every aspect with great accomplishment.

SAP also enabled Bosch to become a One-stop-shop for all the needs related hardware, design, system integration, communication solution provider as well as post go to market service provider. They complement their expertise very well in business and technology domain respectively to offer end to end solutions in order to meet business needs.

SAP & Bosch came out with the working prototype showcasing the IoT hardware design and SAP Leonardo IoT services based application providing the real time operational insight in no time and this was greatly appreciated by our Chairman because in a project like this, time to market plays a very important role. Going forward, we are aligning with Bosch for more use cases in Industrial Application of batteries and developing a one-fit all retrofit for any kind of battery which would need minimal design changes as per the application of the product.





Business Challenge & Objectives

- Increasing warranty cost as percentage of revenue
- Lack of timely availability of data from service centers for warranty analysis
- Lack of accuracy of data for coming out with CAPA
- Very high time line of factory trial
- Time and personnel shortage for digitizing the defect database for analysis
- Lack of knowledge bank to benchmark battery performance data
- Lack of Understanding of the implied needs of consumer
- Meeting aggressive cost and time target of production
- Manual Performance tracking of prototype data

- Provide Enhanced Customer Experience to increase retention
- Create Market Differentiation & increase market share
- Simplify & Automate the warranty management process by reducing warranty claims occurrence & reduced warranty claim costs
- Get insights in product operating conditions, usage & customer install base to offer more customized products, campaigns and service offerings in lesser development time.
- Build Statistical model from data to diagnose battery failure faster. Eventually, increase service technician and team's productivity by equipping them right tools for faster customer complaint resolution
- Achieve higher Motivation for employees with greater sense of accomplishment and pride of bringing innovative solutions to market

Use Cases involving various stakeholders in the value chain



Customer

- Registration of Battery serial no and warranty information
- Remaining Charge and time to discharge visibility
- Raise requests , complaints with status updates
- Get visibility in to battery state of charge/state of health
- Proactive alerts to customer Charge/discharge initiation for extending life of battery
- Auto Reminders to customers for up to date data download
- Auto Reminder for customers for renewing Service contract



R&D Engineer

- Benchmark Installation performance data for faster diagnosis and root cause analysis
- Get Warranty claim insights
- Incorporating product performance and warranty data for product improvement , product design



Service Center Incharge

- Battery Health visibility
- Proactive Services delivery
- Faster turnaround of customer request/



Dealer

- Get Insights for Proactively reaching out to customer for replacement
- Remote Diagnosis



Service Technician

- Installation data capture at site, Geo Tagging of Installation location
- Battery health visibility
- Remote Diagnosis
- Capture installation periodic test and inspection data



Sales and Marketing

- Retain customers by proactively reaching out for life based replacement
- Inventory Visibility
- Proactively Reaching out to customer for AMC service contract renewal
- Segment customer based on usage information and other attributes
- Offer Pay per use and Premium services model
- Proactively reach out to customer for upsell , cross sell opportunities
- Offer Right product at right price point to right customers for increased sales

Value proposition for all the personas in the value chain



Customer

- Improved Customer experience
- Increased Battery Life
- Reduced Maintenance cost



R&D Engineer

- Improved Product Performance
- Availability of real usage data for improving product performance
- Reduced Warranty claims



Service Center Incharge

- Faster turnaround time of customer requests/ complaints
- Increased revival rates
- Reduced Service Logistics cost
- Higher Utilisation of Resources



Service Technician

- Faster Root cause analysis
- Reduced travel time



Sales and Marketing

- Increased customer retention
- Increased market share
- Proactively reaching out customers with upsell/cross sell opportunities
- Incremental Revenue with premium services
- Reduced loss of sales with timely replenishment
- Extend Smart battery offerings to other customer segments for increased revenue



Dealer

- Increased customer retention
- Increased Replacement battery sales
- Better utilisation of technicians



Benefits and Outcomes

Business / Social

- Improving lives of millions of rural and urban citizens with uninterrupted power supply. **(Half a Million households buy home UPS batteries every year)**
- Empowering small businesses like gym owners, apparel manufacturers etc to run uninterrupted
- Better working tools and environment for service technicians
- Reduced Warranty claims **(Current Warranty costs @ 2.3% of revenue today)**
- Faster turnaround time on issue resolution
- Optimized Development Cycles

IT

- Integrated smart product into the existing SAP backend and front end applications for seamless flow of information around R&D, Supply chain and Sales and marketing areas
- Cloud based IoT platform for faster time to market and ability to scale up with newer use cases and cross-product/segment application
- Intuitive UX with easy to use apps and analysis from ERP and Smart product data for enabling predictive use cases in future

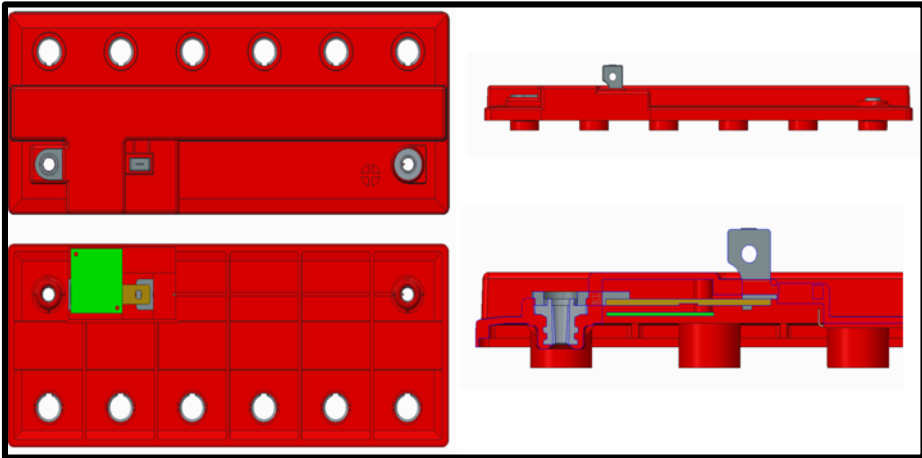
Human Empowerment

- Empowered customer with complete control on battery usage, availability and performance information
- Empowerment employees across services, R&D, Sales & supply chain teams with data driven decision making abilities
- Highly motivated employees owning culture of innovation
- Availability of platform for faster product innovation, building prototype, testing and scale out

Highlights of Engagement so far



Design Thinking Workshop



First Cut Retrofit CAD Drawing



First Cut Retrofit Prototype



Actual 3D Printed Retrofit

Rollout of Smart Battery to Industrial Batteries planned for 2019





Architecture

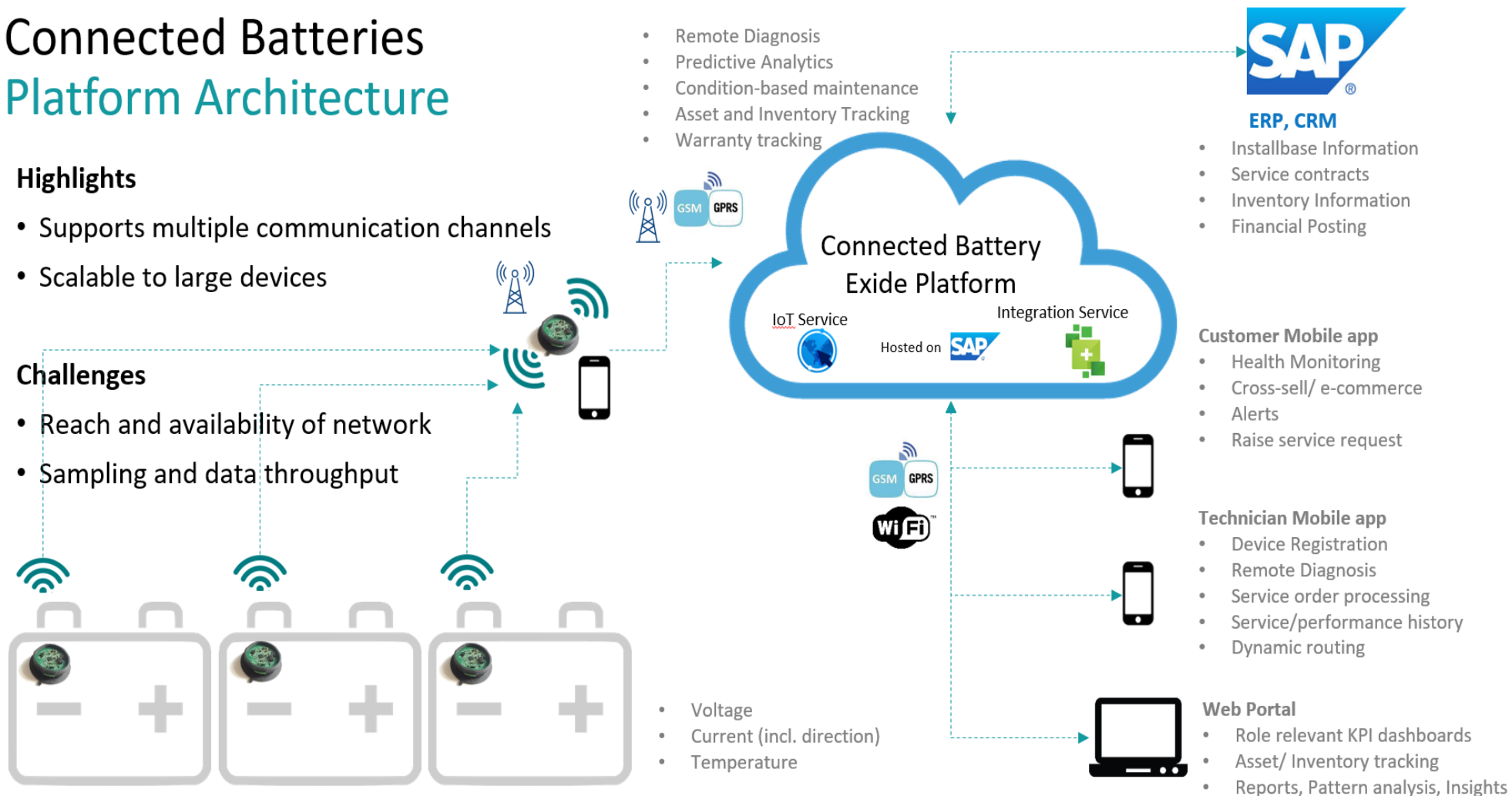
Connected Batteries Platform Architecture

Highlights

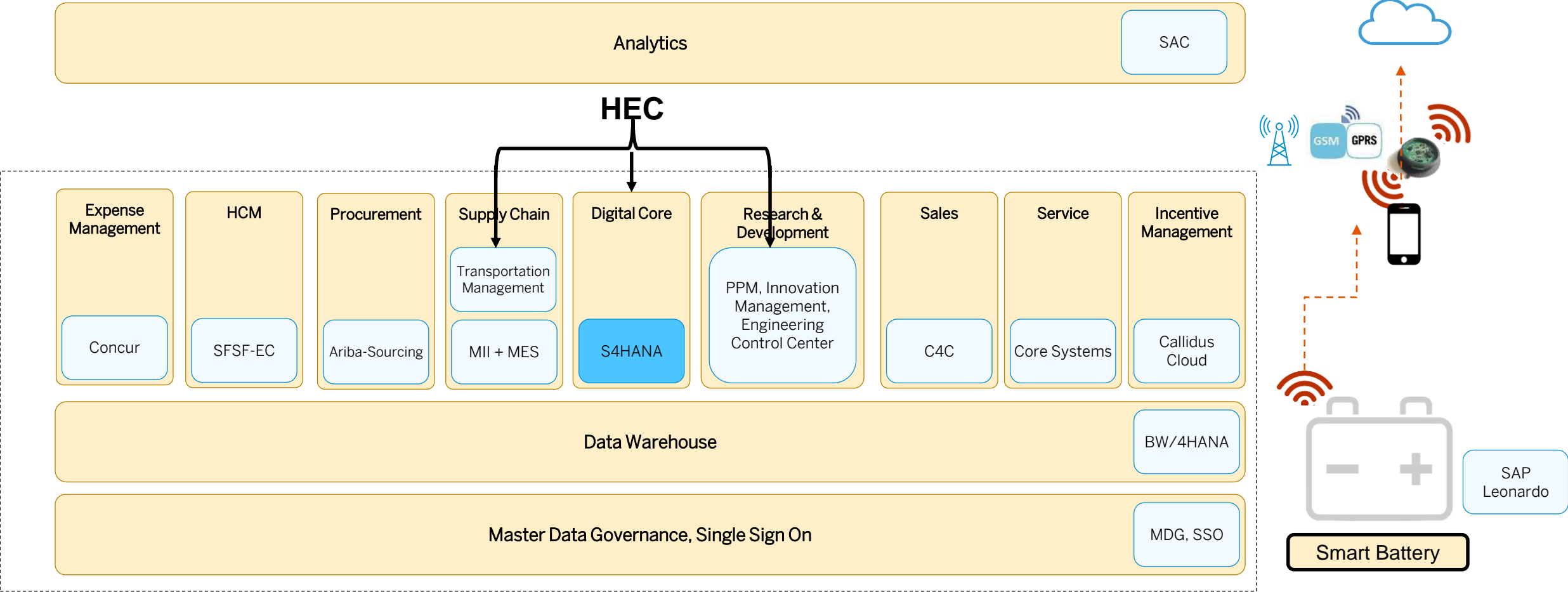
- Supports multiple communication channels
- Scalable to large devices

Challenges

- Reach and availability of network
- Sampling and data throughput



End to End Solution Architecture at Exide Industries on SAP platform





Deployment

Date of Deployment or POC: 10th August 2018

Number of live users: Anticipated 20000 connected batteries

SAP Technologies Used:

SAP Cloud Platform Internet of Things

Central part of the solution. Data from battery sensor streamed and stored using this.

SAP CP SAP HANA service

DB for storing sensor data and creating analytical reports.

SAP CP mobile service for development and operation

Platform for building mobile applications for battery owners and Service Technicians

SAP S4HANA and BW4HANA

SAP Analytics Cloud

Server Processor: SAP Cloud Platform deployed solution

Linux Distribution: SAP Cloud Platform deployed solution



Emerging Technologies and Use Cases

The following Emerging Technologies and use-cases are part of the project and describe the contribution

	Technology or Use Case	Yes/No	Contribution to Project
1.	Machine Learning / Artificial Intelligence	No	
2.	IoT	Yes	Central part of Smart Battery solution to capture key battery parameters and derive insights
3.	3D printing	Yes	The retrofit casing holding all the electronics and sensors is manufactured using 3D printing (see video and pics in slide 9) to enable millions of such casings to be produced for a quicker time to market
4.	Blockchain	No	
5.	API Economy / Integrate the Intelligent Enterprise	Yes	Integration with sales (C4C), services processes (Core Systems) & backend warranty management (S4HANA)
6.	Cloud Native / Event Based Architectures	Yes	Cloud based architecture to reduce capital investment in on premise data base and platform
7.	Extending the digital core with SAP CP / ABAP in SAP CP	Yes	Smart Battery portal for R&D Engineer and Sales & Marketing team built on SAP CP to provide with insights in KPIs
8.	SAP Leonardo Application (extending SAP application, using Industry Innovation Kits or result of Design Thinking workshop)	Yes	Design thinking approach has unearthed multiple use cases for different personas in the value chain. Current application is targeted on service technicians & R&D Department to start with. This is being further extended to the industrial battery segment of battery banks for telecom towers.

Thank You!

Appendix

To be processes post introduction of Smart Battery

New Battery or Replacement Battery Installation (1st Phase)



Customer



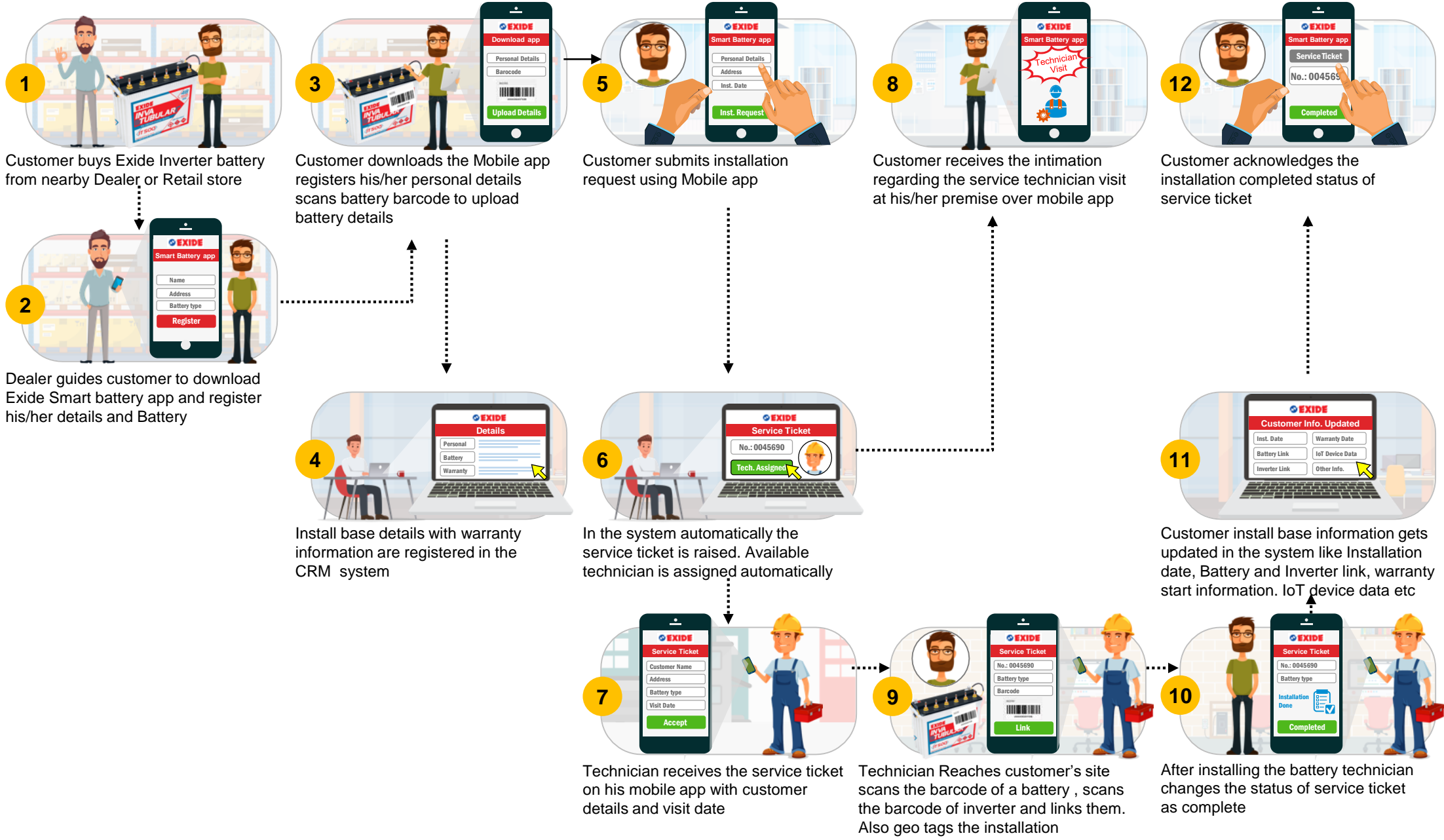
Dealer/
Retail Store



Service Center
Incharge



Service
Technician



Repair & Service Request Processing with Intelligent Insights (1st Phase)



Service center Incharge



Customer



Service Technician



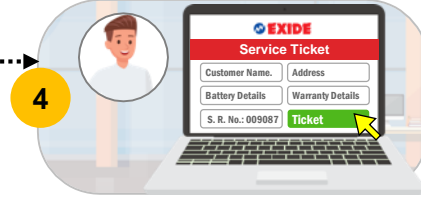
R&D Engineer



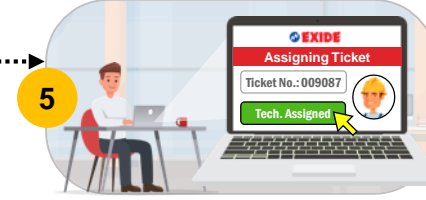
1 Service Incharge has visibility of battery health status of all the installations



3 He receives predictive Alerts on battery health condition



4 Service ticket gets logged in the system with Customer Installbase information



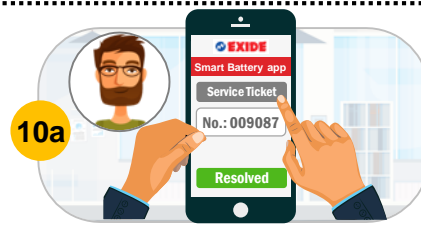
5 Service Incharge allocates the job to available technician and changes the ticket status



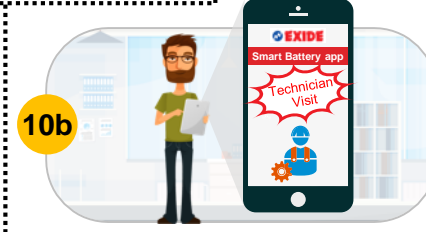
2 Customer also receives notification of battery health condition on his mobile device. He/she raises the service request



6 Customer gets update of service ticket status



10a Customer acknowledges the problem resolution



10b Customer is intimated on planned technician visit



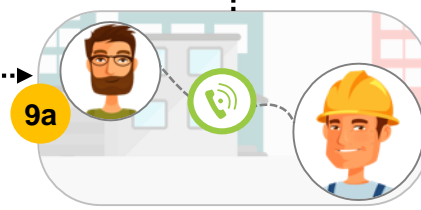
13b Customer gets status update about its request and able to track the battery status till its final status is declared



7 Service technician receives new job on his mobile device having customer details



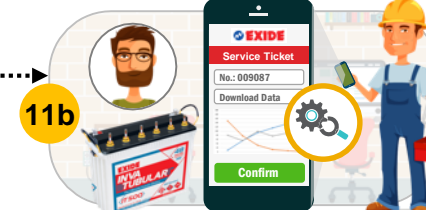
8.1 Service technician remotely accesses the battery details and does the remote diagnosis.



9a If the problem can be resolved remotely service technician intimates the same to customer



9b If the problem can not be solved remotely. Technician plans the site visit with all the testing tools



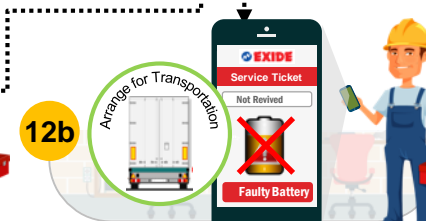
11b After reaching the site technician downloads all the data about the battery performance, starts testing



8.0 R&D Engineer has access to all the data regarding customer installation, type of complaints, previous root cause analysis done on various types of fault, battery age, Performance benchmarks etc. to devise the remote diagnosis analytics method. The service technician are trained on the same



12a If the battery is revived with initial testing and diagnosis, technician declares it as healthy and gets acknowledgement from customer



12b If the battery is not revived at site technician declares the battery as faulty and arranges for transportation to send it to service center

AMC Service Contract Renewal (2nd Phase)



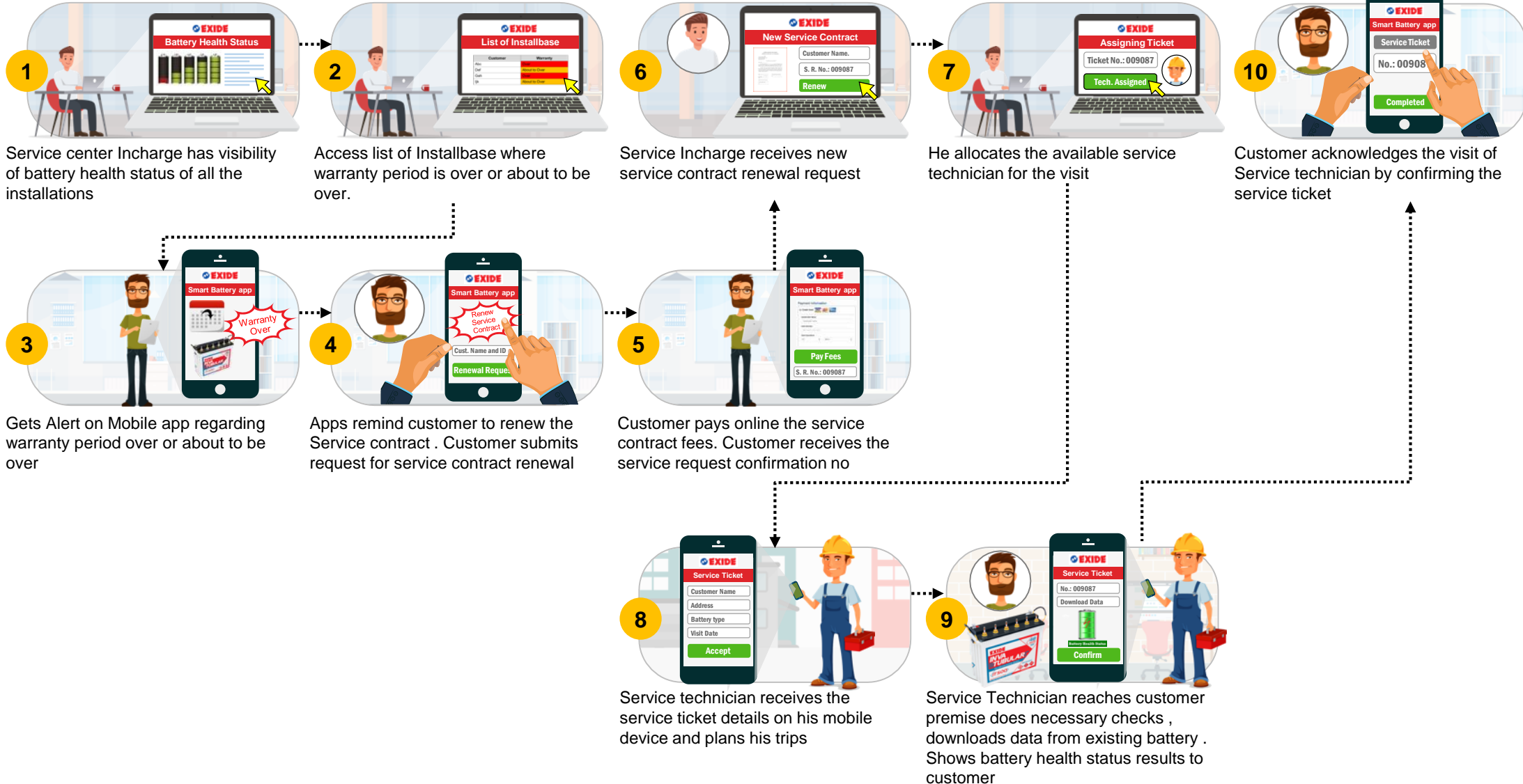
Service Center Incharge



Customer



Service Technician



Proactive Alert for Charge/Discharge Initiation (2nd Phase)



Service Center Incharge



Service center Incharge has visibility of battery health status of all the installations

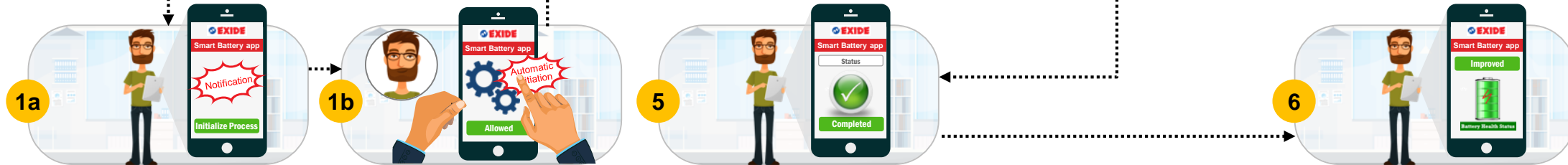
He monitors alerts regarding battery charge/discharge requirements to increase the life of battery

Customer is intimated about the required charge/discharge initiation to extend the life of battery

Charge / Discharge is initiated remotely on customer's consent



Customer



Customer receives Notification about the required charge /discharge initialization through mobile app

Customer allows charge /discharge automatic initiation or he/she initiates him self required charge/discharge cycle

On completion of required level of charge/discharge the customer is notified about the status

Customer gets visibility into improved battery health status and remaining life

Auto Reminder to Customers for Up to date Data Download (2nd Phase)

