

MOBILITY & ANALYTICS SERVICES

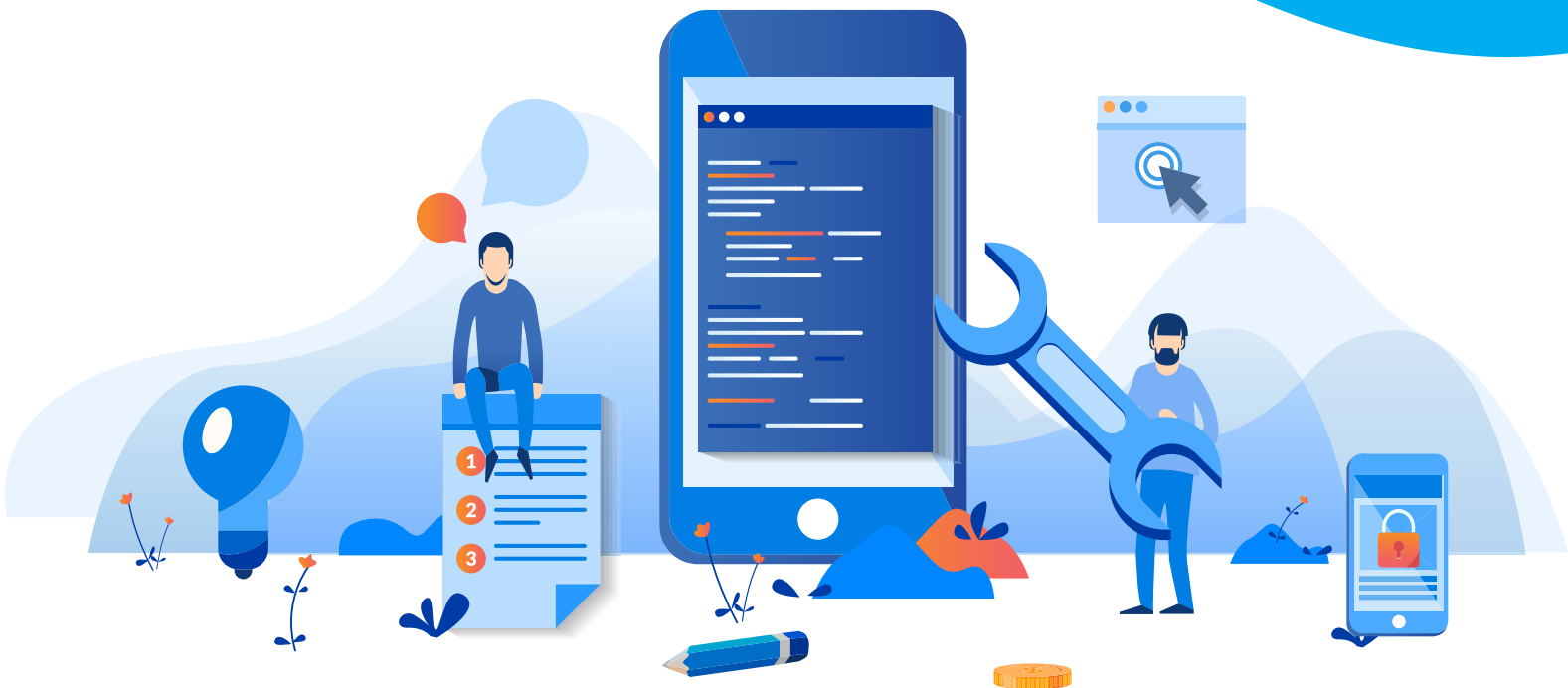


INTRODUCTION

At HCL's Digital & Analytics division, we help design and build key platform components of customers' Digital-Technology-Footprint to power their Digital transformation journey. Our team of design-thinkers & industry-process experts help our customers break down barriers by combining deep knowledge of business processes with user-centered design principles – to truly visualize the potential of digital technology.

HCL's Digital & Analytics services brings its entire gamut of expertise – from consulting to implementation – to ensure that digital journeys can enable an end-to-end IT its transformation.

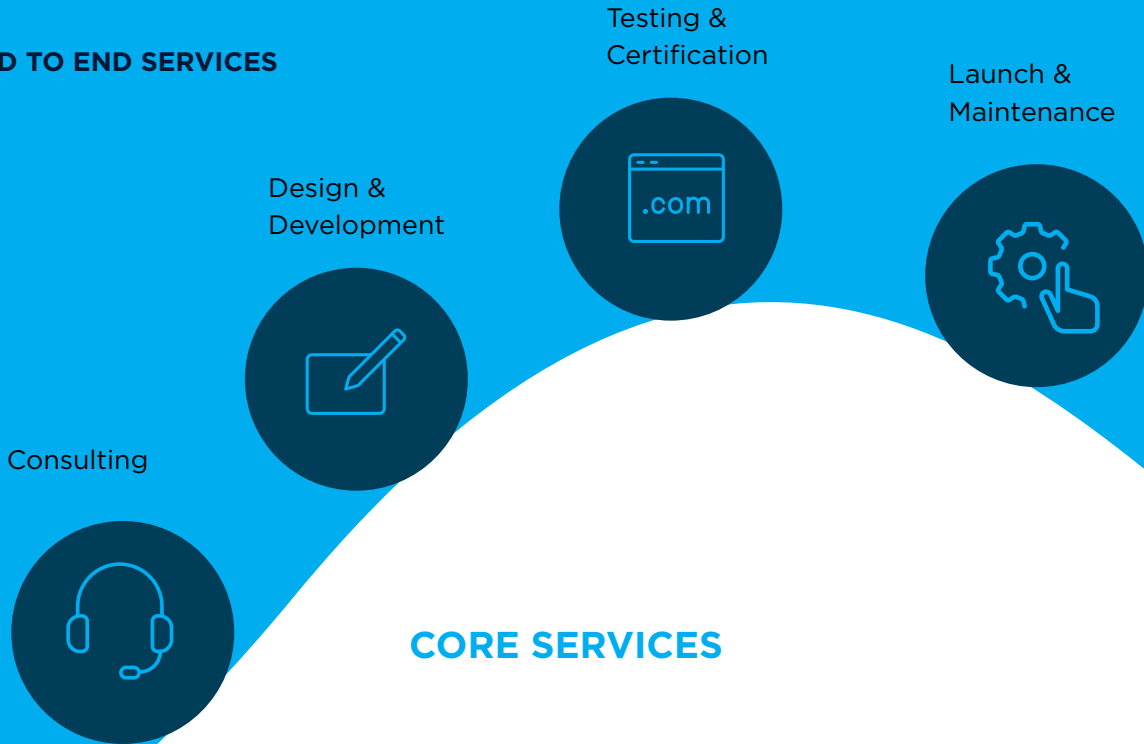
We believe that every enterprise has a unique DNA. We help amplify this uniqueness, through the power of digital technologies and analytics.



MOBILITY SERVICES

MOBILITY COE

END TO END SERVICES










CORE SERVICES

- Wireframe
 - Visual Design
 - Responsive/ Adoptive web design
- Native Apps**
- Custom built Hybrid App Write Once Run anywhere - Mobile App Frameworks
- Mobile Web Apps**
- Manual
 - Automation
 - UI Compatibility
 - Performance

| | | |
|------------------|------------------------------|----------------|
| UX DESIGN | DEVELOPMENT PORTFOLIO | TESTING |
|------------------|------------------------------|----------------|

INDUSTRY SEGMENTS

| | | | |
|---|---|---|--|
| Manufacturing  | Aerospace  | Telecom  | BFSI  |
| Medical Devices  | Online & ISVs  | Media & Entertainment  | |

MOBILITY SERVICES – TECHNOLOGY LANDSCAPE

CONSULTING

- Consulting Framework
- App Development approach selection tool
- IT and Technology Landscape
- Reference Architecture
- Best Practices and Guidelines
- Application & Technology Roadmap

EVALUATION & TRAINING

- New Technologies Training
- Swift Training
- Automation Tools Training
- IKM Assessment

DEVELOPMENT

- Phonegap
- Titanium
- Angular IS Xamarin
- Objective C
- Swift, Android SDK
- React, Flex, Rapid
- CQ5, HTML5
- CSS3
- Apache Wicket
- JQuery Mobile
- Sencha Touch

TESTING & CERTIFICATION

- UI Automation
- See Test, Robotium
- Selenium
- Crashlytics
- Ruby, Calabash
- Cucumber

ENABLERS

- Test Automation Framework
- MMA
- Factory Model for Mobile Dev and Sustenance

BUSINESS BENEFITS

QUANTITATIVE BENEFITS

Overall
Effort
Savings

32% - 37%

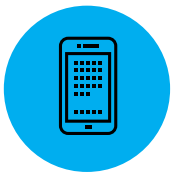
Overall
Cost
saving

**20-25%
Approx.**

Time to
market

**3 to 4
Months
Approx**

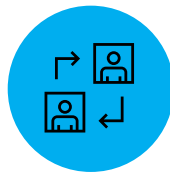
QUALITATIVE BENEFITS



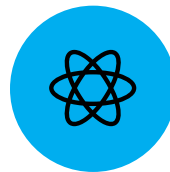
Platform can be leveraged to enable Mobile as an Aggregator + Monitoring & Controlling in IOT ecosystem



Overall product cost reduction due to usage of platform features



Competitive Advantage



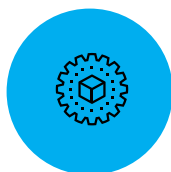
Reusability across products / projects



Compliance to Standards and Guidelines



Device Connectors for enabling communication through Mobile



Customizable according to the needs



Expertize in Mobility



Ready to use and Future Proof



CASE STUDY : MOBILE INTEGRATED PARKING STATION SYSTEM DEVELOPMENT

SCOPE

Mobile Integrated Parking Station development with third party cash recycler system.

CLIENT

Parking Station Manufacturer

HCL APPROACH

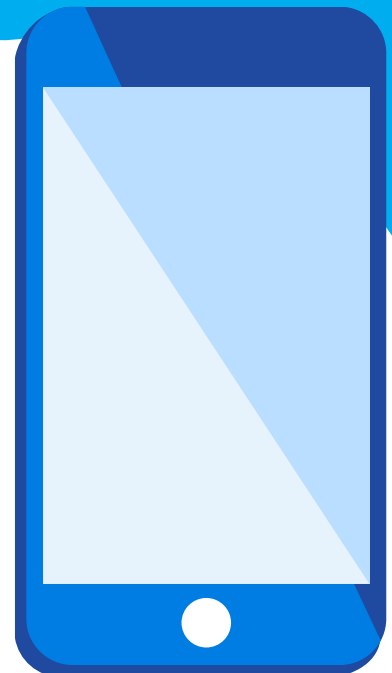
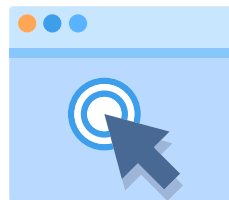
- End to End development of the system
- Leveraged the Linux Customization Expertise @ HCL
- HCL UxD CoE to design UI for Mobile/Tablet
- Team Leader with experience in J/XFS
- Firmware team comprises of Device Service experience

TECHNOLOGY/TOOLS HIGHLIGHT

- ARM Cortex-A8
- Linux, Android, C++/C, JNI, Java
- RabbitMQ, Tomcat, Client 's RDC
- J/XFS
- Third Party Cash Recycler

HCL SOLUTION

- Mobile Interface to Parking station
- E-Receipt to mobile
- Cash Deposit functionality
- Balance Dispense functionality
- Admin Functionality
- Diagnostic module
- Display Driver
- Service Utility





ANALYTICS SERVICES

ANALYTICS COE

CREDENTIALS

Investment in Cognitive Analytics CoE dedicated to Machine Learning, Deep Learning, Statistical Techniques, & other Advanced Analytical Methodologies

Consulting

- Business Use Case Definition
- Data Quality and Integration Assessment
- Ecosystem Monetization
- Information Management System Design
- Technology and Tools Stack Evaluation/ Recommendation

Expertise in implementation steps of Analytical Solution: Architecture & Design, Data Governance, Data Warehousing, Business Intelligence, Agile Analytics Solutions, Data Science

Engineering

- Agile Analytics Integration with Legacy/ Upcoming Applications
- Enterprise Data/Data Science Platform Solution
- Digital Engineering
- Information Management Platform
- Benchmarking and Tuning

Accelerators like Data Science Lab & Re-useable Components

Operations

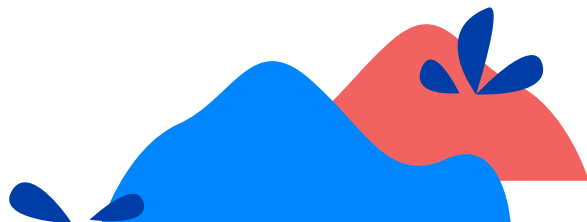
- Data Management Platform Management
- DevOps Integration (Data Sc/Application)
- Shared Services and CoE
- Change and Configuration Management
- Streamlining Business Process
- Data Standardization

UNIVERSITY PARTNERS

Carnegie Mellon University



INDUSTRY PARTNERS

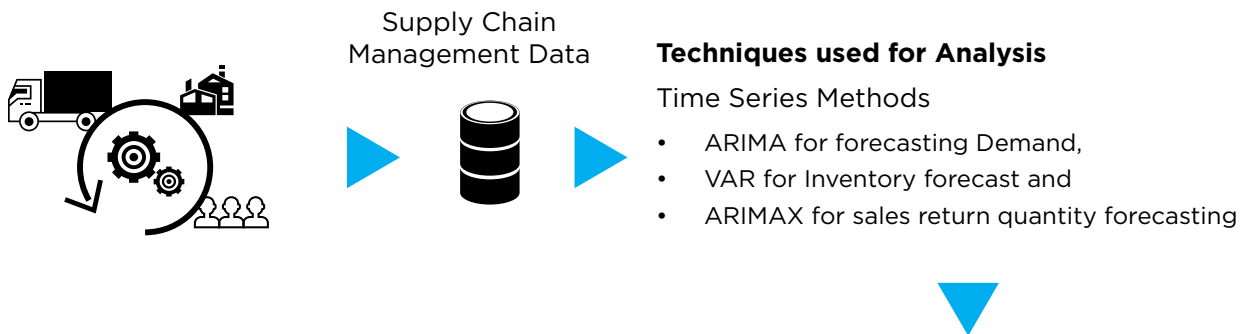


CASE STUDY : SUPPLY CHAIN MANAGEMENT - INVENTORY FORECASTING

BUSINESS CASE

An U.S based ERP software development company wants to incorporate analytical solution to

- Improve operational efficiency
- Optimize resource planning



Forecasted results leading to

- Optimal inventory management
- Efficient order fulfillment
- Improved resource allocation

Key observations:

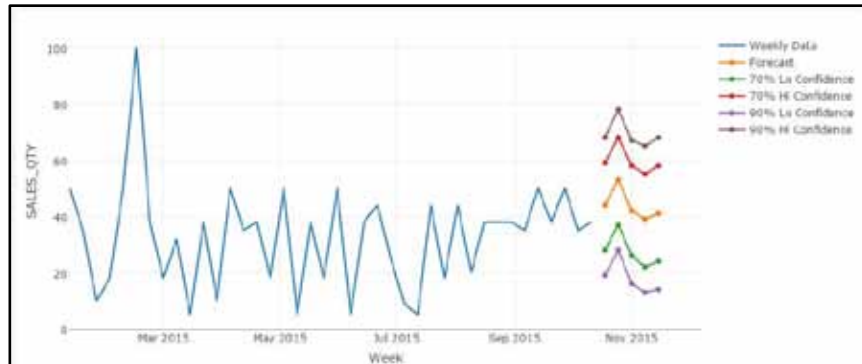
- Forecasting for Optimal Planning
- Improved Operational Efficiency
- Effective Cost Management
- Enhanced Reporting

SOME OF THE REPORTS GENERATED RESULTING INTO INSIGHTS:

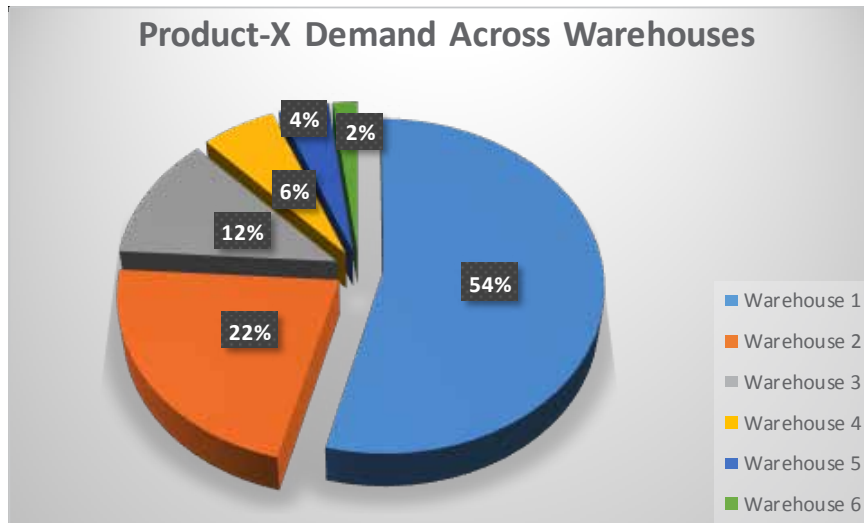
Forecasted Weekly Numbers



Weekly Forecast - Product wise



Product-X Demand Across Warehouses



CASE STUDY : PROGNOSTICS OF MACHINE HEALTH

BUSINESS CASE

A Engine manufacturing company wants

- Condition-Based-Monitoring for its products
- Integrate analytics to the system where sensor data is used to predict hazardous status



Sensor Data

Methodologies used for Analysis & Modeling

- Data Pre-processing with Normalization for creating usable features
- Identification of extensive Multicollinearity
- Non-Linearity in data
- Ensemble methods like Random Forest did not return sufficient accuracy

Techniques leading to key observations:

- Fuzzy Forest used to select important features
- Extreme Gradient Boosting used for classification

The Following insights were derived related to the issues:

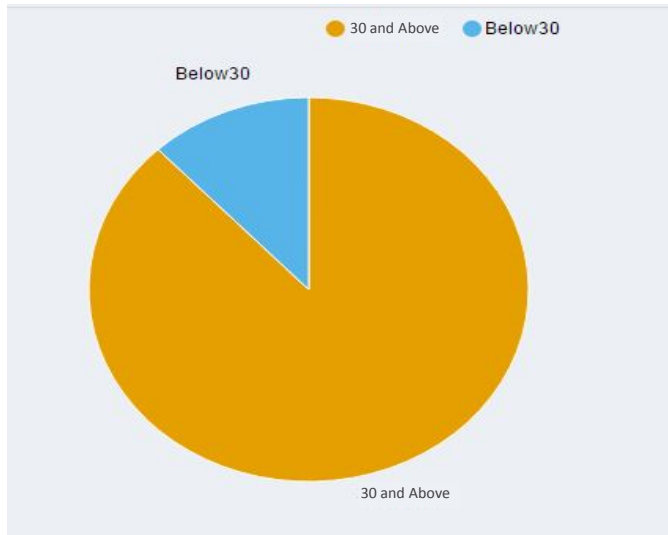
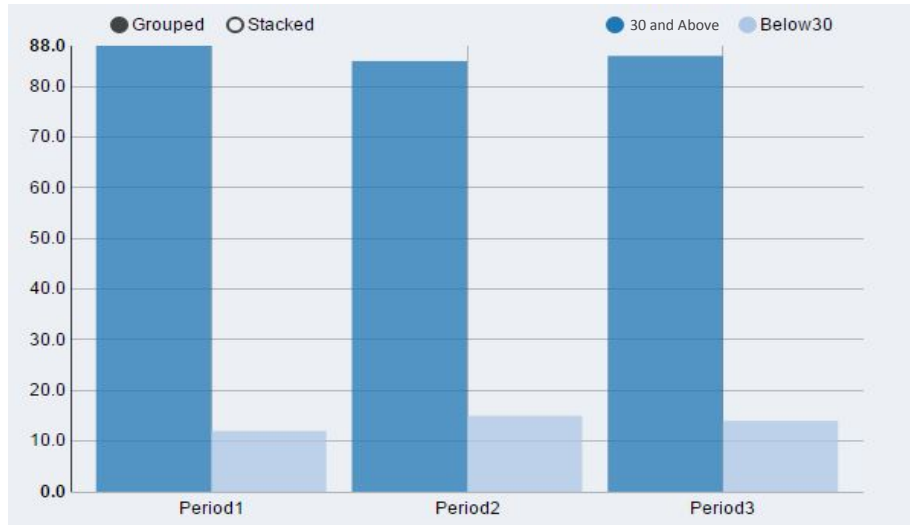
- Model to compute and continuously update residual life distributions of partially degraded components
- This forms basis for alert notification to service engineer
- Predicting the risky zone beyond which it is not preferable to operate the engine

Techniques leading to key observations:

- Threshold beyond which it is not preferable to operate the engine
- Patterns that alert for real-time condition monitoring information



PERIOD WISE MONITORING OF ENGINES





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Relationship[™]
BEYOND THE CONTRACT

HCL