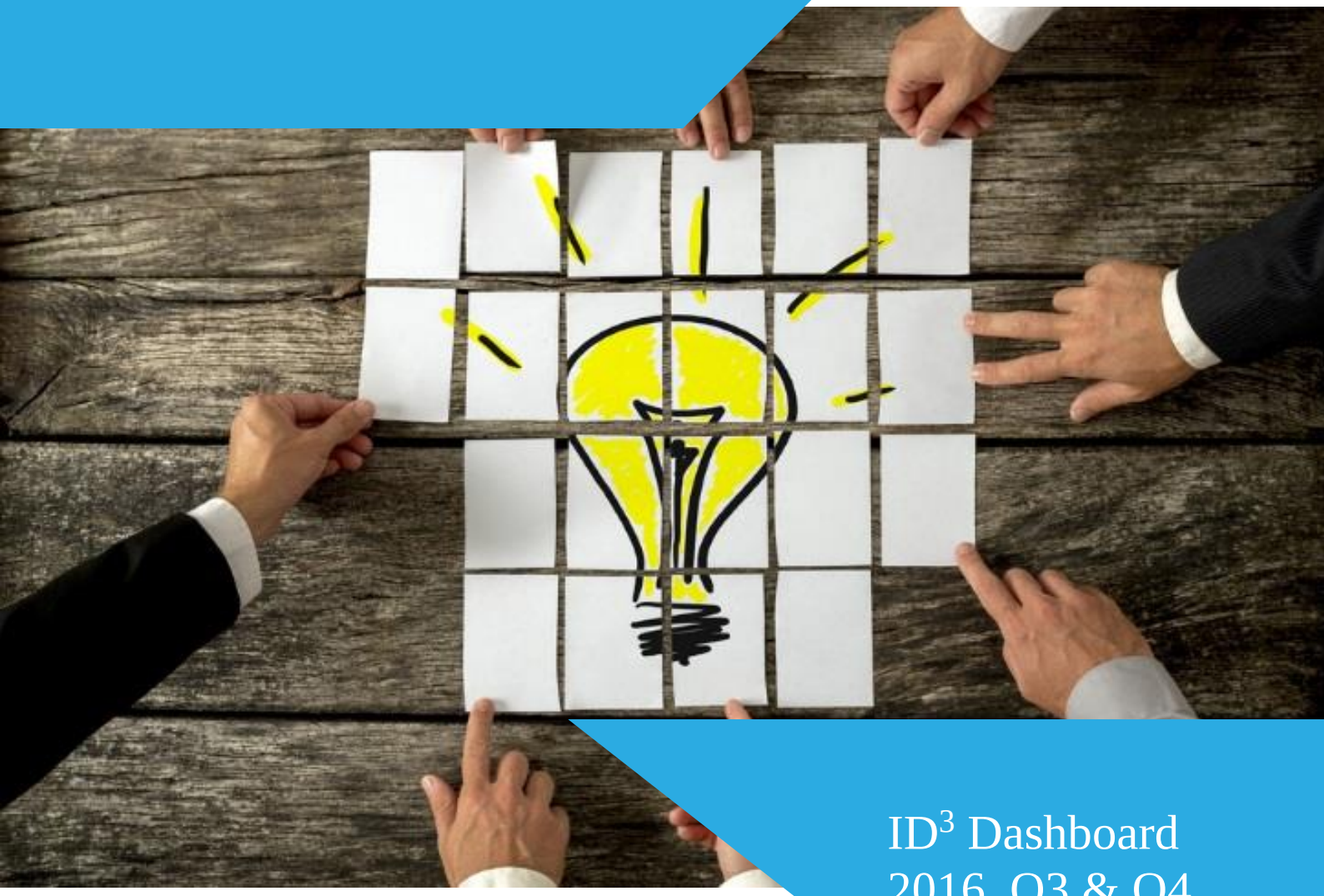
ID^3

UST Global Innovation Studio



ID^3 Dashboard
2016, Q3 & Q4

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* New

ID³ - UST Global Innovation Studio

UST Global Innovation studio (ID³) provides a problem sensing and solutions framework to find innovative solutions for our customer business problems. The framework helps to tap the collective genius within UST to provide balanced and repeatable solutions with a significant value add to our customer. The framework involves an expert team that performs extensive research, business analysis, design, development and product management to create an innovative solutions.

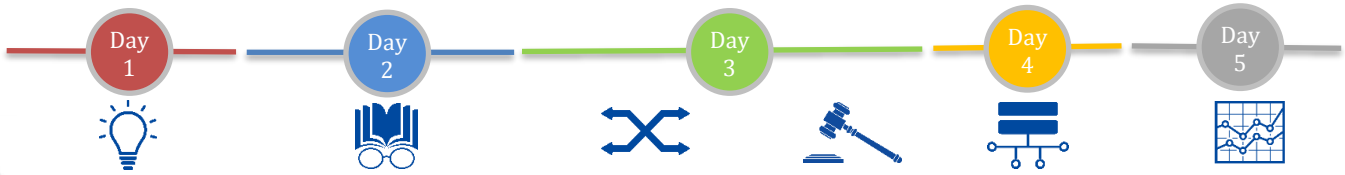
	Discover	Distill	Define	Innovate	Instrument	Industrialize
Contributor	Pods, Client Partners, Executive Teams	Originator, Idea Champion, Executive Teams	Idea Champion, Partner Ecosystem, Executive Teams	Innovation Studio, Hackathon, Executive Teams	Turbo Innovation, Executive Teams	Account Team, Executive Sponsor
Duration	Continuous	1-3 Weeks	1-2 Weeks	2 Weeks	12 Weeks	3-6 Months
Outcome	Ideas, Opportunities	Problem Definition	Candidate Selection Concepts	Minimum Viable Concept (MVC)	Minimum Viable Product (MVP)	Product
Platform	← RISE- Rapid Innovation & Solution Environment →			← SEED - Scaled Evolutionary Engineering and Design →		

ID3 framework adopts design thinking tools & techniques like Design Sprint, Hackathon Sprint etc. to help customers to validate the design and an MVP iteratively within a minimal span of time and resources before commercialization.

- The ID³ Design Sprint is a very effective process to produce a Minimum Viable Concept from the Candidate Solution concepts within a very short span of time.
- The Hackathon Sprint events are conducted to develop a Minimum Viable Product in a short span of time.

ID³ Design Sprint

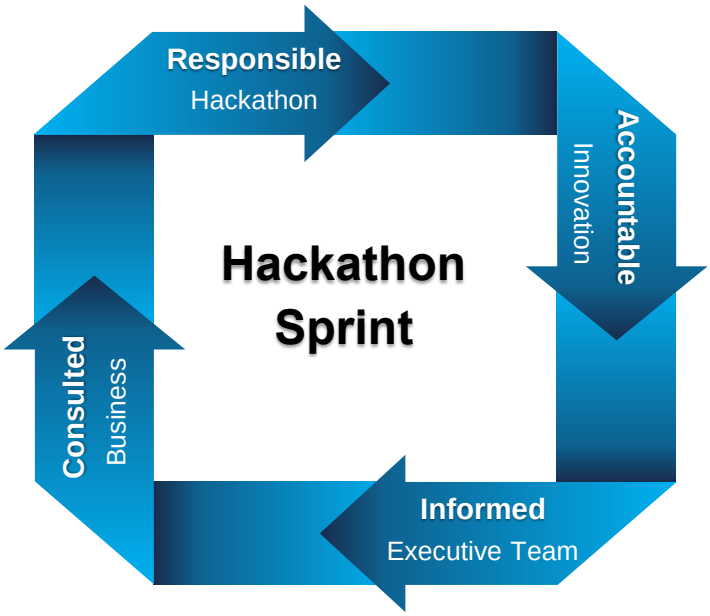
ID³ Design Sprint is UST Global's customized Design Thinking process that usually spans for 5 days and is defined in six stages with clearly defined goals and expected outcome for each day. The active participants involve a design team that comprises of a Design Champion, Engineering Champion, Prototype Champion, Technology & Domain SMEs and a Client Partner, Customer user and an Idea Lead. All experts working together for a short period, facilitates rapid prototyping and quick user feedback focusing on the right solution.



	Understand	Define	Diverge	Decide	Prototype	Validate
Sprint Stage	• User needs • Business goals	• Define principle • Design strategy	• Explore ideas • Identify user value • Technology	• Assess the ideas • Shortlist solution	• Mock • Demo	• User feedback • Technical feasibility
Outcome	Educated sprint team on problem & goal	Design strategy	List of candidate solution concepts	Shortlisted "Candidate solution concept"		• Prototype • User acceptance • Backlog
Contributor	• Client partner • Customer user • Idea lead • Design sprint team	• Design champion • Engineering champion • Technology/domain SME	• Design champion • Engineering champion	• Design champion • Engineering champion • Prototype champion		• Client partner • Customer user • Idea lead • Design sprint team

ID³ Hackathon Sprint

Hackathon is an event with specific focus to produce a Minimum Viable Product or to address specific use cases with minimal resources and time. This event, which is typically conducted for a week or two, involves programmers, graphic designers, interface designers, project managers, Infrastructure engineers and other development stake holders who collaborate intensively to meet the objective.

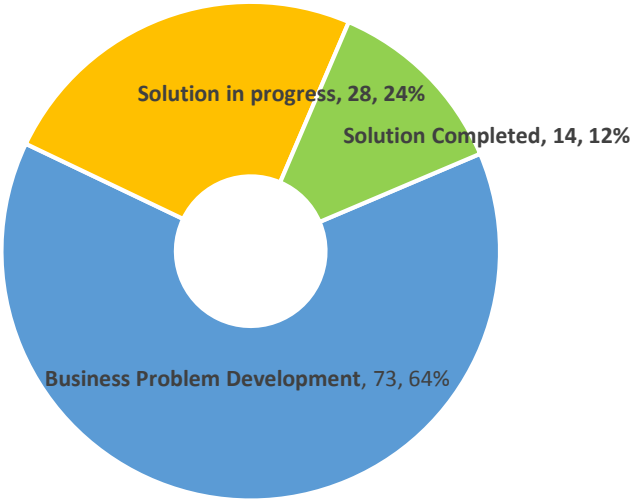


2016 Q3 & Q4 Snapshot

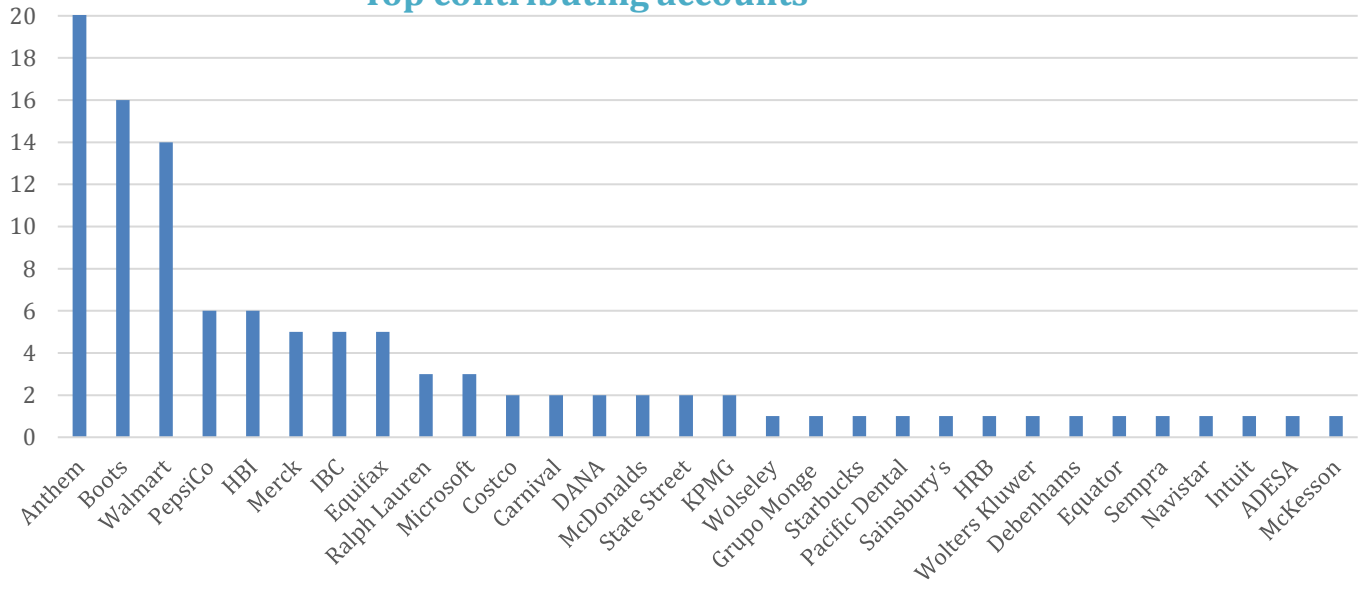
Accomplishments

- ✓ Captured top business problems from top 30 customers from 18 different domains
- ✓ 2016 Q3 & Q4 - Captured 115 potential customer business problems with TCV $28M and Wt. Pipeline ~$5M.
- ✓ 2016 Q3 & Q4 – Solution completed for 13 business problems with TCV $11M
- ✓ 2016 Q3 & Q4 – ~$ 0.5M new digital revenue closed
- ✓ UST internal platform launch (to replace SoapBox - cost $50K/year) is targeted for end of December
- ✓ Introduced design thinking tools & techniques to accounts and customers
- ✓ Positioned innovation as organization culture & DNA as part of digital transformation journey

Business Problem Inventory & Execution Status



Top contributing accounts



ID³ Innovation Solution Repository

1. Integration of Virtual Assistants with Mobile Solutions *

Applicable Industry/Scenario

This is applicable to any vertical where customers are looking for a chatbot based improved, personalized mobile experience to get their queries answered without the hassle of clicking through several menus and options.

Business problem

Our client is a major Healthcare provider based out of US. It is noted that the adoption rate of the existing mobile solutions is comparatively low, possibly due to a lack of personalized and engaging experience for the members using those mobile apps. It is recommended to improve the customer experience making use of advanced technologies in digital space. (Business Problem # 134)

Pain Areas

- Poor Customer Engagement
- Unimpressive Customer Experience
- Not enough information in the app

Solution and Features

There is a flurry of virtual assistants in the market from major vendors such as Amazon, Apple, Microsoft and Google. But, it was noted that many of these platforms are not yet fully opened to all third party services, or they are platform specific, or running on proprietary hardware. These platforms are more generic and is not easily customizable to the said client. Data privacy is another major concern.

One of the key improvement suggestion was to introduce a digital virtual assistant to meet members' health and wellness needs, giving the members a personal touch to every relevant need that they might have. UST proposed to develop a customized virtual assistant, known as AVA (Virtual Assistant) that's designed for specific client needs.

The proposed AVA solution shall address the following key areas of member health and wellness needs:

- Search for Providers
- Fix an Appointment
- Consultation on health and wellness
- Search for matching plans

It is expected that the digital assistant's response is fully aligned with that of client's existing portal. As the first step of the complete AVA solution, UST developed an MVP that focused on a specific use case – search for a physician. The MVP is trained with a knowledge map that included a subset of the specialties and locations.

a. Implementation Highlights

Glossary

- Utterance: A single voice conversation made by a user
- Intent: Refers to the core objective of a conversation. This will, in turn, map to an enterprise API call that takes zero or more parameters. The purpose of an Assistant framework is to gauge the intent from a series of conversations in a session

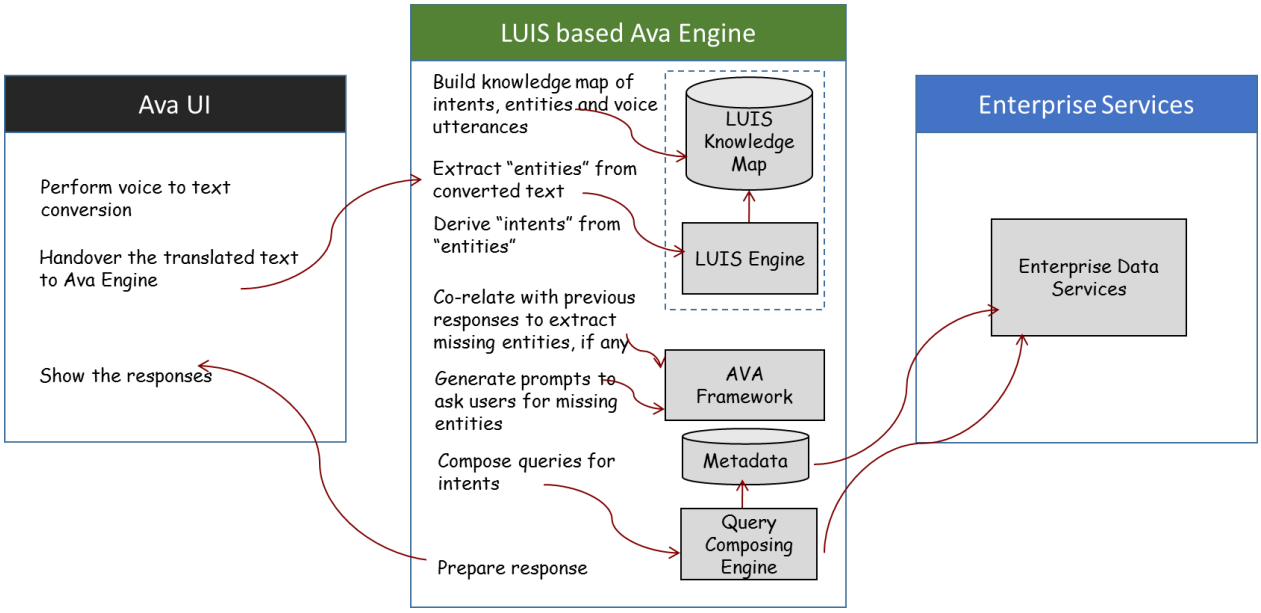
- Entity: Refers to the objects associated with an intent. These entities will in turn become the actual parameters for making the API call. The Assistant framework will need to extract each of the required entities to fulfill the mandatory parameters for an API call.
- Co-relation: It is possible that a single utterance may not have all the required entities for making an API call. These entities may be revealed in subsequent conversations. So, it is required that the extracted entities kept in a cache so that a lookup can be done by the framework to decide if all the required parameters are available for making an API call

Solution Summary

The solution uses LUIS (Language Understanding Intelligent Service - https://www.luis.ai/), part of Microsoft's Cognitive Services, as the core engine for parsing the voice utterances (made in natural language) contextually and extract the various entities and make the best guess on intents.

AVA framework interfaces with LUIS to retrieve the entities and checks to see if all the mandatory parameters can be fulfilled with those entities for making an API call to the backend. In the absence of one or more mandatory parameters, the framework inspects the entities extracted from previous conversations in the same session to see if any of the missing parameters can be fulfilled. If not, a pre-configured prompt question is picked and sent back to the user in an attempt to gather the required mandatory parameters.

Note: LUIS provides options to co-relate entities in a chain of conversations, but the MVP implementation keeps this logic within AVA framework so as to have a better control on the way the parameters are fulfilled for API calls.



Android version of the AVA client uses the native SPEECH APIs for voice to text conversion, and then pass it to the AVA framework for processing.

b. Next Steps

Being an MVP, the current version of AVA is trained for only a Physician Finder intent with limited number of specialties and locations. The following activities are recommended for making it to a production ready version:

a. Redefine the intent to make the provider type also as a new entity. This shall indicate whether the search is for one of the several categories as displayed in the portal (i.e., whether the search is for a physician, hospital, critical care etc.)
b. Define the entities for all specialties as displayed in the portal
c. Define additional entity for mentioning a radius for search within a given location
d. Train the LUIS engine with an exhaustive list of utterances indicating symptoms and intents

Value Proposition

Item	Description
Improved Customer experience	○ Interaction through natural language ○ Voice based inputs ○ More personalized experience for members
Extensible platform	○ Platform can easily be trained for adding more use cases ○ Self-learning to provide more accurate responses

2. Carrier Optimization

Applicable Industry/Scenario

Retail, Transportation & Logistics or any industry scenario where implementation of advanced match making algorithm will be useful.

Business problem

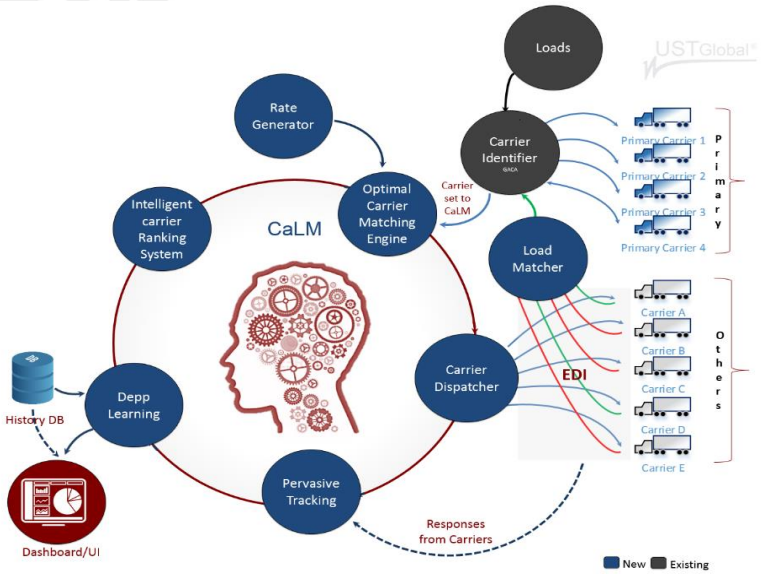
One of the largest retailers in the world seeks to improve efficiency of their existing process of identifying carriers for tendering of loads. (Business Problem # 71)

Pain Areas

- Inefficient Auto assignment– A non-preferred vendor assignment causes high cost per load due to manual intervention
- Fleet rejection after accept –Short notice rejection after accept causing manual intervention and non-optimal carriers get selected.
- Additional manual intervention overhead during carrier contract renewal period.

Solution and its components

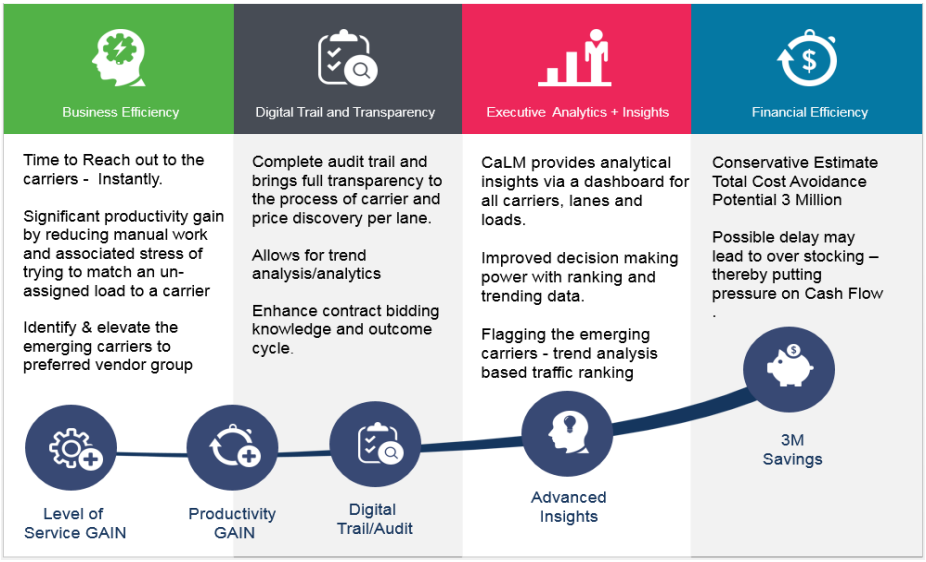
- Carrier Identifier – existing system that identifies the preferred Carriers that have an existing contract with pre-negotiated rate. If no preferred carrier is identified within 48 hours before the deadline, the carrier identification task is assigned to CaLM system (UST proposed solution).
- Optimal Carrier Matching engine – uses Match Making Algorithm for efficient carrier assignment based on load size & characteristics, carrier efficiency, expected delivery time, cost.
- Intelligent carrier Ranking System – uses Page Ranking Algorithm to rank carriers based on availability, past performances, probability of rejection after acceptance and cost. This in combination with the output of Rate Generator helps identify the top carriers for the current load.
- Rate Generator – Fixes the maximum rate for the current load based on historic data
- Carrier Dispatcher –notifies the selected carriers for taking up the load
- Load Matcher – picks up the carrier when multiple carriers are available to take up the load
- Pervasive Tracking – tracks all identified carriers for the load, their responses to Carrier Dispatcher and feeds this information to the Deep Learning system



Key features

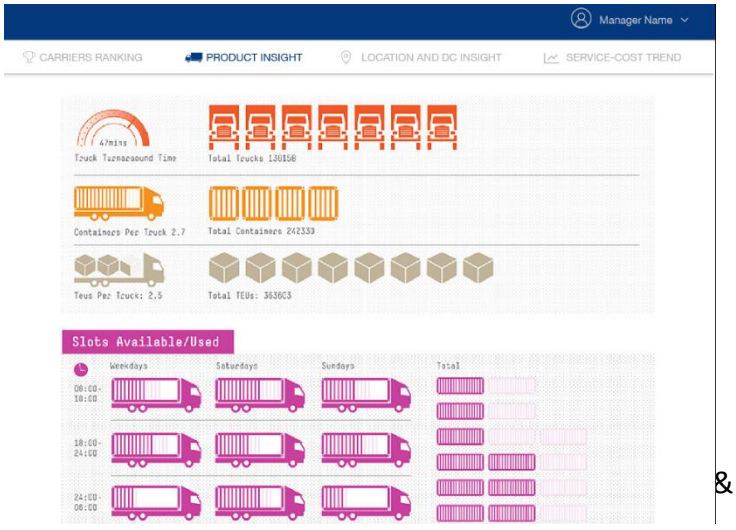
- Enhanced carrier tendering
- Timely insights via mobile
- Intelligent algorithmic analysis
- Eliminate 'need pick up' state
- Real time operation automation vs manual effort
- Seamless integration

Value Proposition



Dashboard Mockup

Executive Insight



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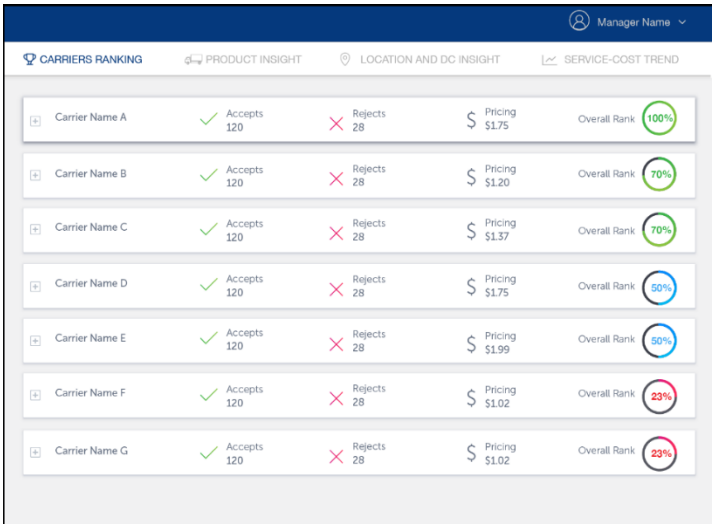
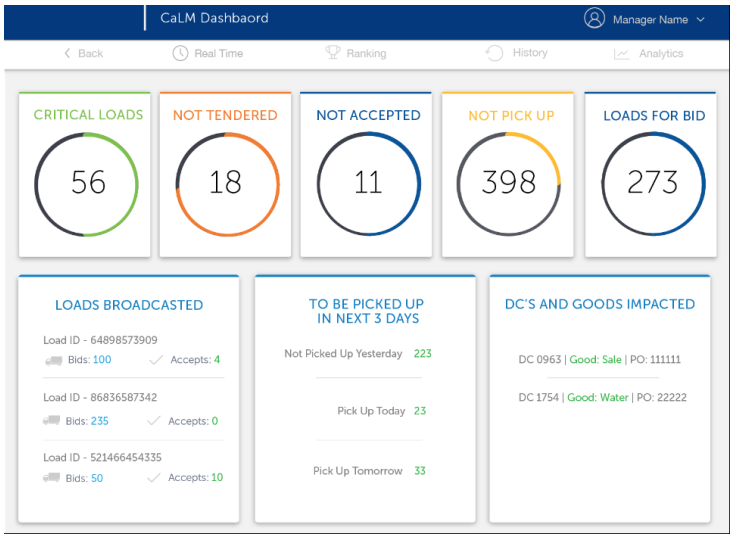
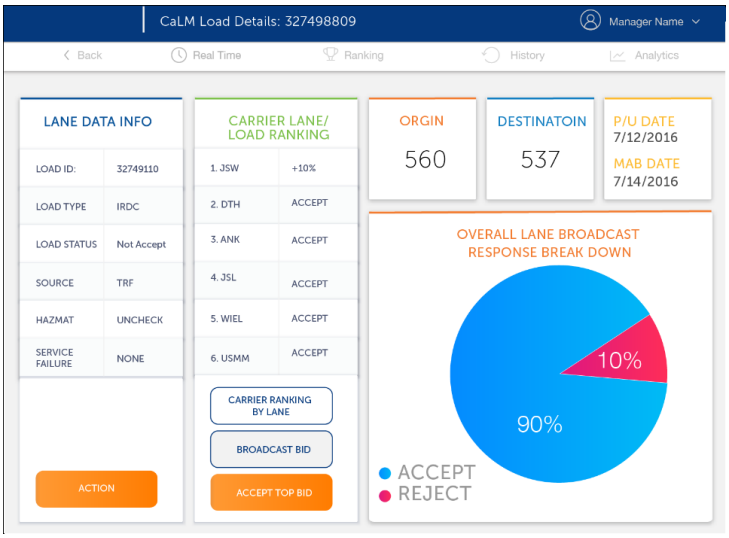


Traffic Coordinator





3. Health & Wellness App

Applicable Industry/Scenario

Healthcare. This idea is applicable to any industry scenario where the client wants to improve their presence in mobile space via Apps.

Business problem

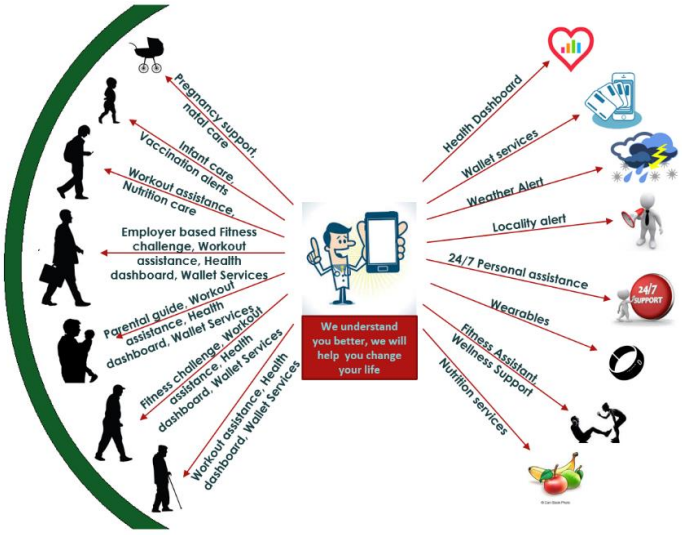
Improve user engagement on mobile App by introducing game changing health and Wellness related ideas. The App should provide truly disruptive ideas to stay at par with its competitors. (Business Problem # 54).

Pain Areas

- Current App lack enough and accurate information
  - Not aligning with the client's goal of "improved transparency"
  - Higher customer care call volumes
- Absence of essential features to promote usability. This results in negative feedback from customers and it ultimately impacts brand value (especially within millennials)
- Absence of features that can keep the customer engaged on a daily basis

Solution and Features

Solution is to develop a more personalized App



Key Features

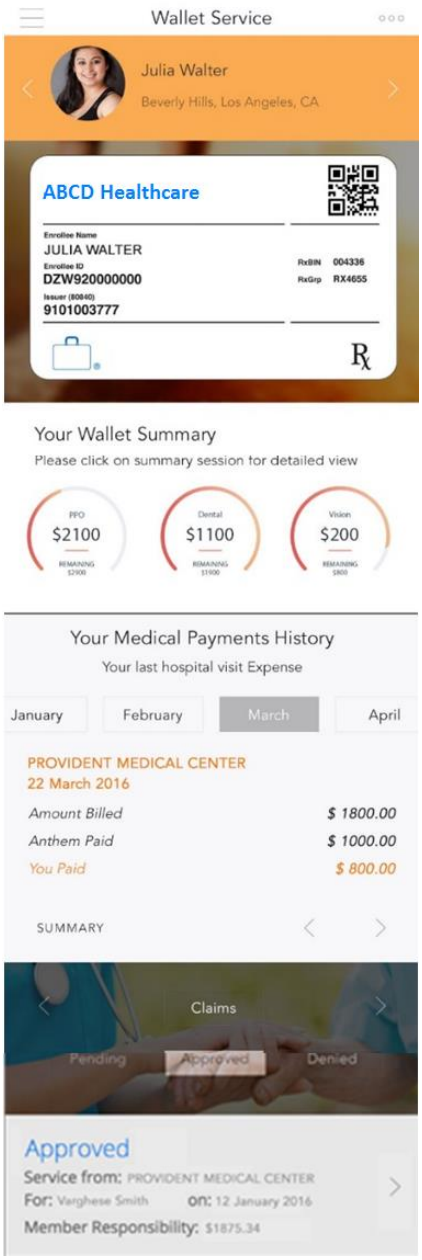
- New features introduced for tracking FSA/HSA spending
- New Self-Health awareness features with Visual connect to preventive health
- Subscription based alerts – CDC alerts, health warning alerts, Severe weather, Vaccination etc.
- Integration with devices, wearables & gadgets
- Insurance, health data, wellness plan, Nutrition services all in one application
- Wellness challenges with Incentive based programs
- Specialized alerts/guidance during special phases of life like Pregnancy, Infant/child care etc.

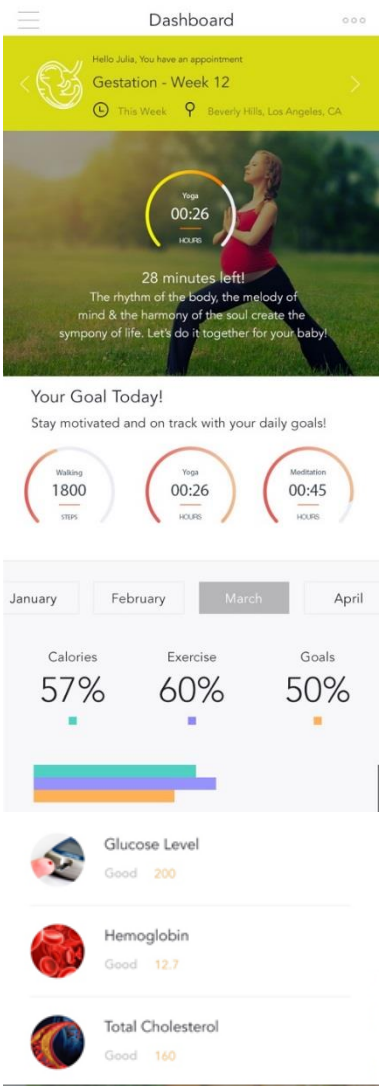
Value Proposition

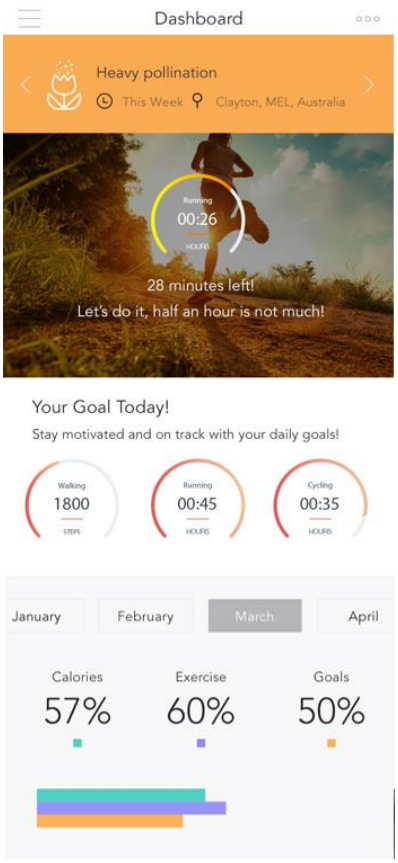
Improved user connect	Increase in customer adoption	Transparency and manage healthcare expense	Preventive Care
New features introduced to engage users on a daily basis Personalized Dashboard	**Improved Branding** Features like Wellness campaigns and Fitness challenge will result in	**FSA/HSA tracking and claims tracking** Health Wallet Features to track the healthcare expenses and improved	**Healthy member base** Preventive care and location based alerts helps members avoid potential health issues. It's a win-win deal between

Fitness Assistant and wellness support	increased user base and improved branding	transparency with claims submissions	insurer (client) and insured (members), leading to reduced healthcare expenditures.

Features Mockup







4. Mobile Workforce Management solutions for Field Services business

Applicable Industry/Scenario

Vehicle Auctioning and Remarketing, Oil and Gas sector, commercial trucking and to any Field Services industry that uses legacy handheld devices (MDTs / PDTs).

4.1. Lot Check System

Business problem

Upgrade existing system, for Vehicle Auctioning and Remarketing, that involves legacy handheld devices and outdated platform that is going out of support by 2018. (Business Problem # 15)

Pain Areas

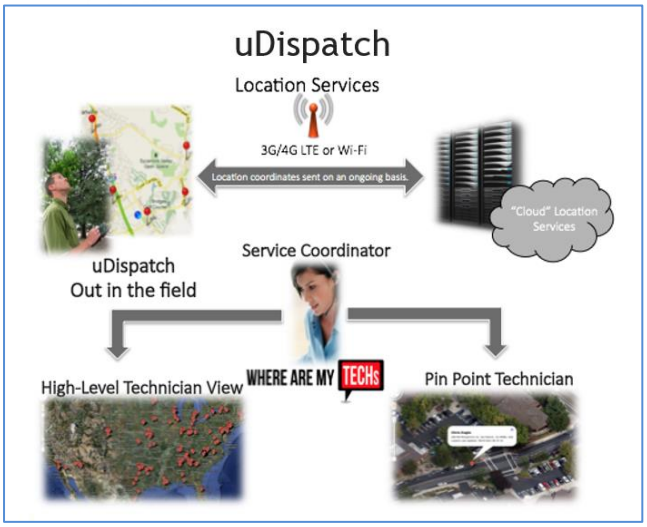
- Outdated technology stack – Impacts the business efficiency across the board
- Legacy handheld device and platform - The current handheld device and platform are complex, less efficient and expensive (~$3M every 3 years)
- Scalability - Increase in vehicle inspections/inspectors causes scheduling and efficiency issues

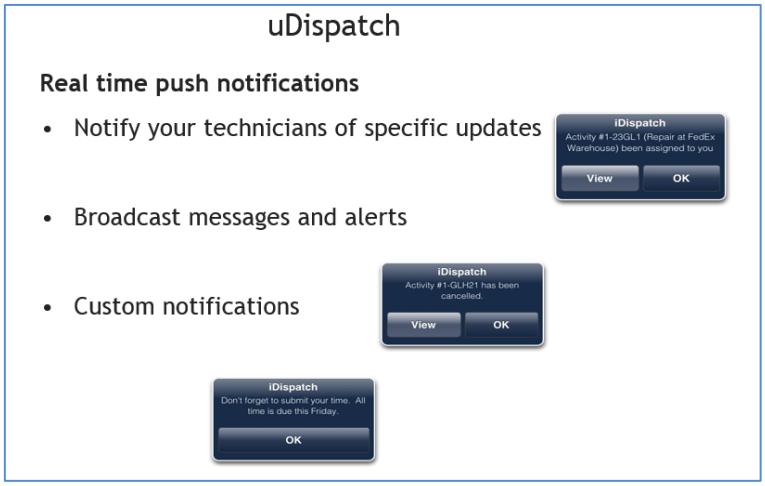
Solution and Features

Solution involves leveraging the mobility platform to develop the next generation app with latest technology that results in improved user experience and application performance. The mobile workforce management platform provides all necessary features requires for the Field Services business.

Key features

- Self-audit by dealers
- Validate co-ordinates and photos with GPS proximity of dealer address
- Print sticker barcode for easier future auditing
- ODB II/GPS Tracking/Virtual Audits
- Dealer/Inspector Ranking system
- Tracking devices like Tile /TrackR



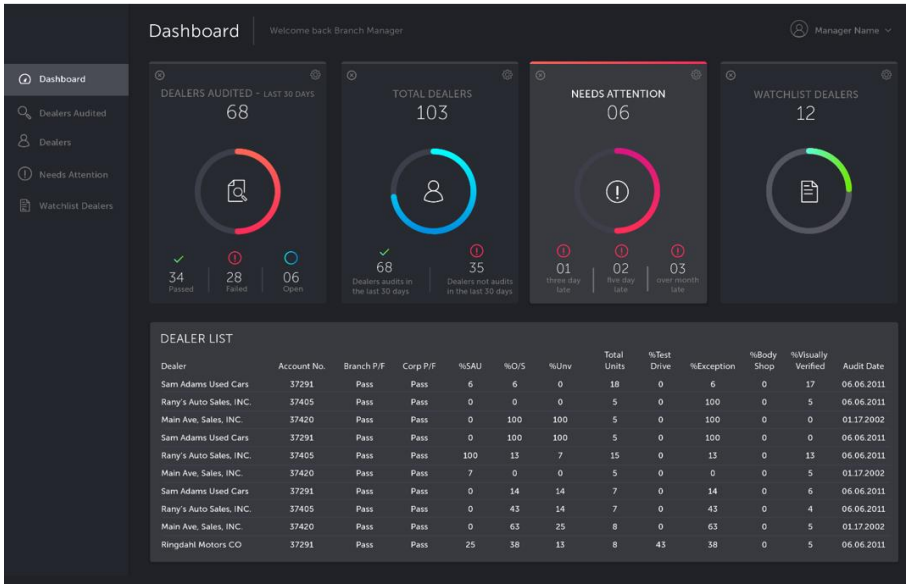


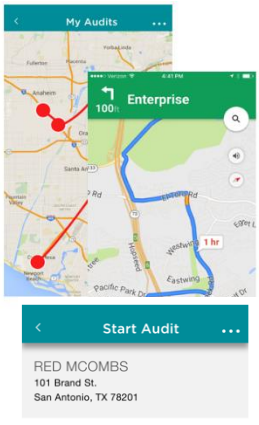
Value Proposition

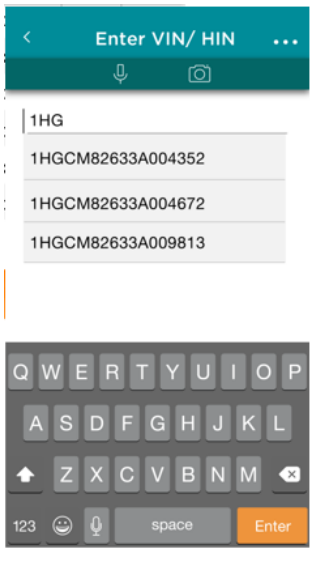
Solution can save $4M - $10M annually based on assumptions and estimates

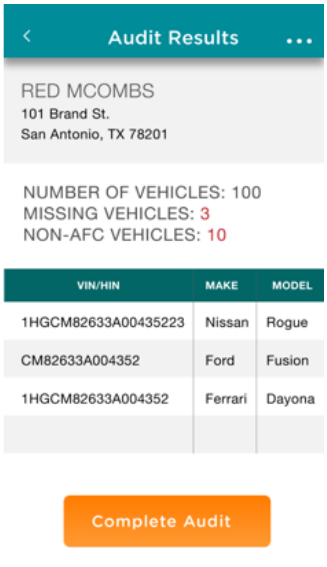
Efficiency Gains	Cost Savings	Business Growth and Opportunities
• KPI Measurements – Analytics • Efficient routing and tracking • Intuitive design and features for faster auditing	• Virtual Audits – Estimates % of physical audits • Self Audits by dealership – Audit location verification • AV2 handheld to customer based devices	• Identify additional financing opportunities by auditor • Self load new vehicle data by dealers • Better risk assessment – virtual audits for high end vehicles • Better risk assessment – Additional data collection from audits

Mockup screens









4.2. MDT system upgrade

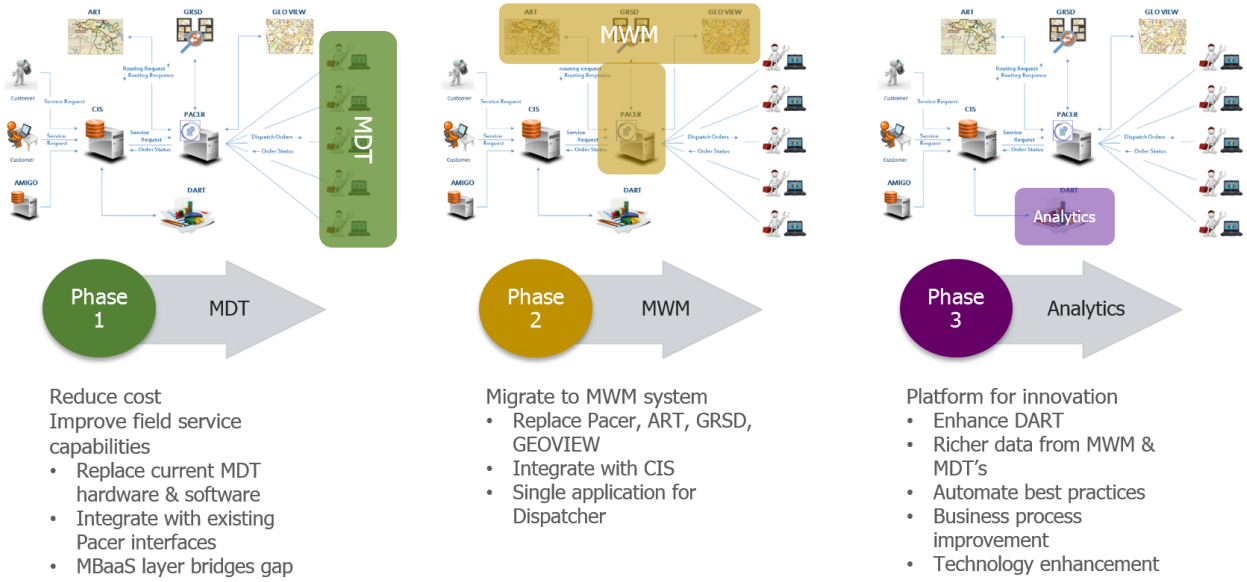
Business problem

Upgrade existing system, for Oil and Gas business, that has an outdated field service management system involving Mobile Data Terminals (MDT). (Business Problem # 16)

Pain Areas

- MDT devices are expensive, ~$2M every 5 years
- Outdated system/technology – The core runs on a 30 year old system. Concerns from customer on the aged system that can cause catastrophic business failure
- Operational cost – Critical & same day orders are manually dispatched resulting in higher cost
- Limits Improvement - business process closely tied to outdated system makes it difficult to change/improve current process
- Lack of integration between applications - Dispatchers end up using multiple applications to perform single task causing inefficiency
- Gaps in office automation - Re-assign workflow & Routing capability is still a manual process

Solution and Features



Reduce cost
Improve field service capabilities

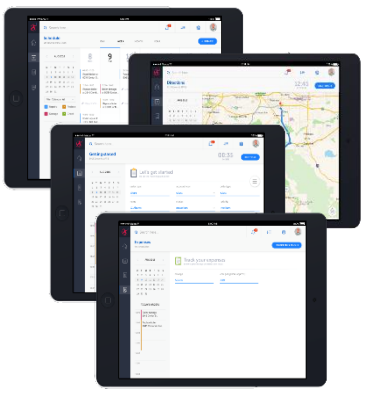
- Replace current MDT hardware & software
- Integrate with existing Pacer interfaces
- MBaaS layer bridges gap

Migrate to MWM system

- Replace Pacer, ART, GRSD, GEOVIEW
- Integrate with CIS
- Single application for Dispatcher

Platform for innovation

- Enhance DART
- Richer data from MWM & MDT's
- Automate best practices
- Business process improvement
- Technology enhancement



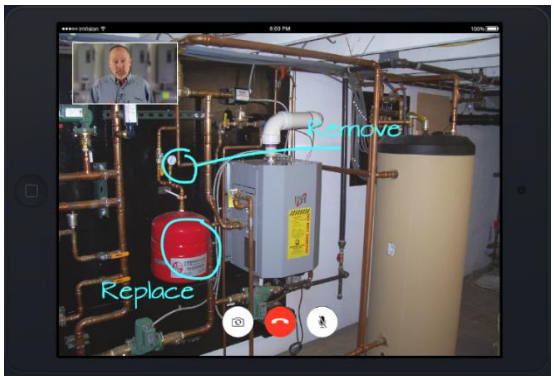
Key features

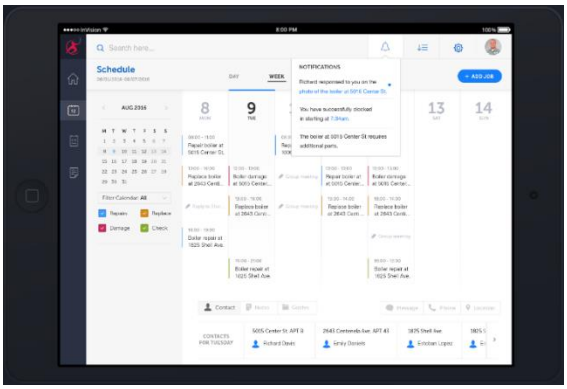
- Reduce dependency on MDT - features migrated to mobile apps, saving cost
- Introduce MWM to replace outdated systems
- Improved Data Analytics
- Create process for continuous improvement

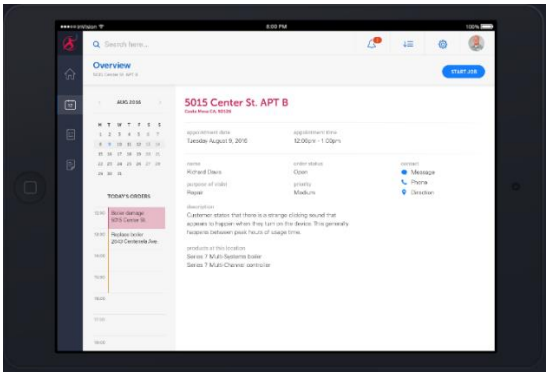
Value Proposition

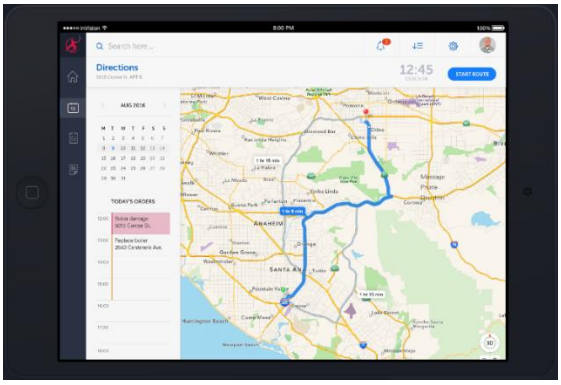
Time to Market	Improved Efficiency and Customer satisfaction	Cost savings	Operational Efficiency
Improved technology stack assists easier extension of capabilities and quicker time to market The solution can be Cloud based and can be rolled out faster	Automatic scheduling of A1,A2, same day orders Automated customer call/text ahead based on technician's current location Video collaboration – technician to technician, technician to back office	Move to consumer device will result in 48% cost savings	Solution can be cloud based which benefits reduction in operation staffing & infrastructure costs

Mockup screens









5. Environment Management

Applicable Industry/Scenario

Any business/client that faces environment management issues both production and non-production related.

Business problem

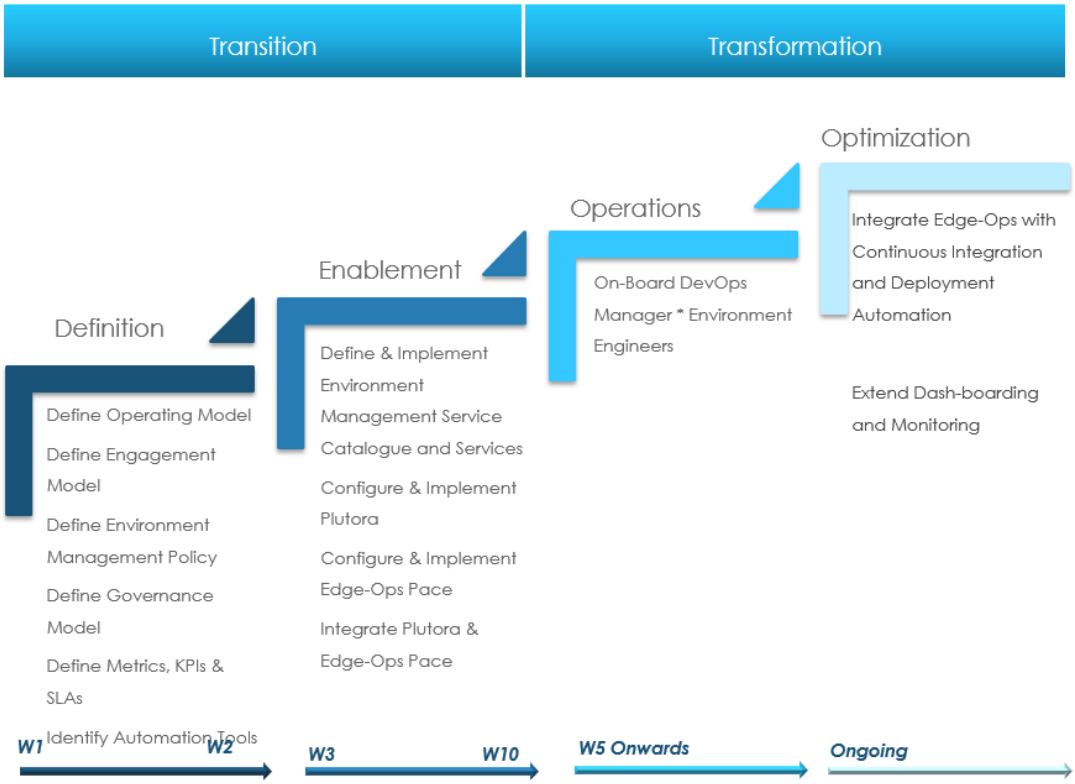
Improve Operational efficiency to manage non-production environment related issues. (Business Problem # 50)

Pain Areas

- Time consuming maintenance
- No real time visibility of back fill status
- Highly manual operations
- Overhead maintenance
- Manual post-deployment validation

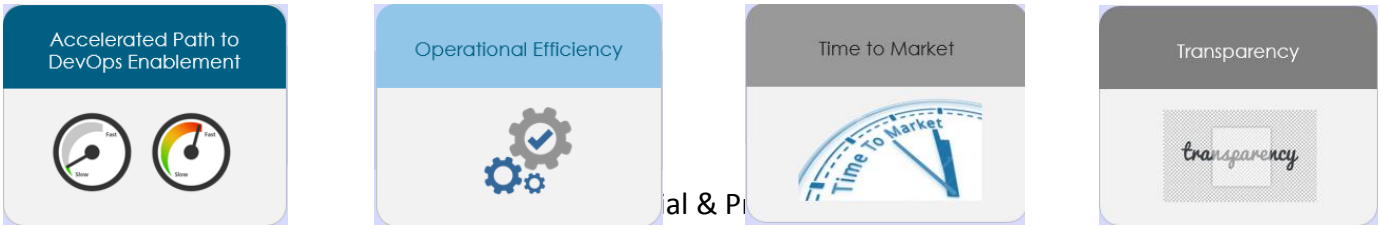
Solution and Features

Implementation Approach for the e-Commerce client



This problem requires a tool that helps deliver continuous stream of business value to the customer and EdgeOps is highly recommended.

Value Proposition



6. Chatbot – Artificial Conversational Entity

Applicable Industry/Scenario

Any business/client that involves a conversational partner, including social media channels, for various practical purposes like customer service or information acquisition.

Business problem

BUSINESS PROBLEM #99 - Disruptive ideas to assist customers to choose the health care plans best suited for them based on the demographics information and basic questions regarding past doctor visits.

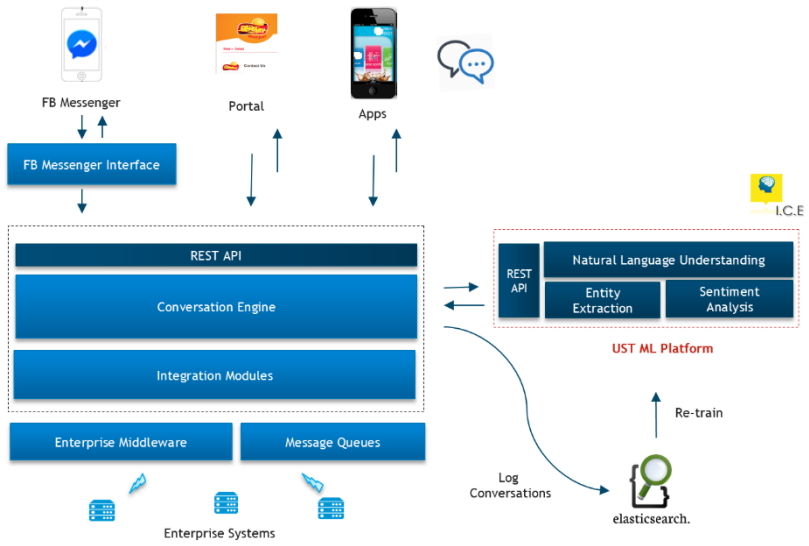
BUSINESS PROBLEM # 123 - Provide better, efficient and low cost customer communications and relationships through multiple channels like Facebook, Twitter, etc.

Pain Areas

- Bottle Neck – drop in efficiency with increased customer calls
- Cost and Inefficiency – current process is inefficient, for example, operator involvement on conversations that are structurally repetitive

Solution and Features

Solution involves UST Intelligent Computing Environment (I.C.E), an environment for rapid development of machine learning solutions. I.C.E supports 'Natural Language Understanding' than basic 'Natural Language Processing'.



Key Features

- A generic architecture that can support multiple channels like Web Chat, Mobile app's Chat and Facebook
- I.C.E can categorize complex conversations based on intent, features entity extraction , sentiment analysis
- Opens conversation with operator when ChatBot is unable to respond to user queries
- In case of operator unavailability, bot promises follow up from an operator when available

Value Proposition

Improved customer connects	Operator overriding and Cost Savings	Operational Efficiency
ChatBots provide personalized and guided experience for customers Call free customer support	Cost Savings through Accelerated process	Reduced bottlenecks and improved Operational Excellence Textual methods for conducting structurally repetitive conversations

Support for Multiple channels like WebChat, Mobile App Chat and FaceBook. This can be extended to now channels like Amazon Echo.	Allows Operator overriding feature to respond to complex queries from customer.	

8. Data Migration Automation

Applicable Industry/Scenario

Any business/client that involves Data Migration requirements that cannot be resolved using standard Machine Learning algorithms. This solution helps extract data migration rules based on initial small data mappings and based on the rules, generates mappings for large data sets.

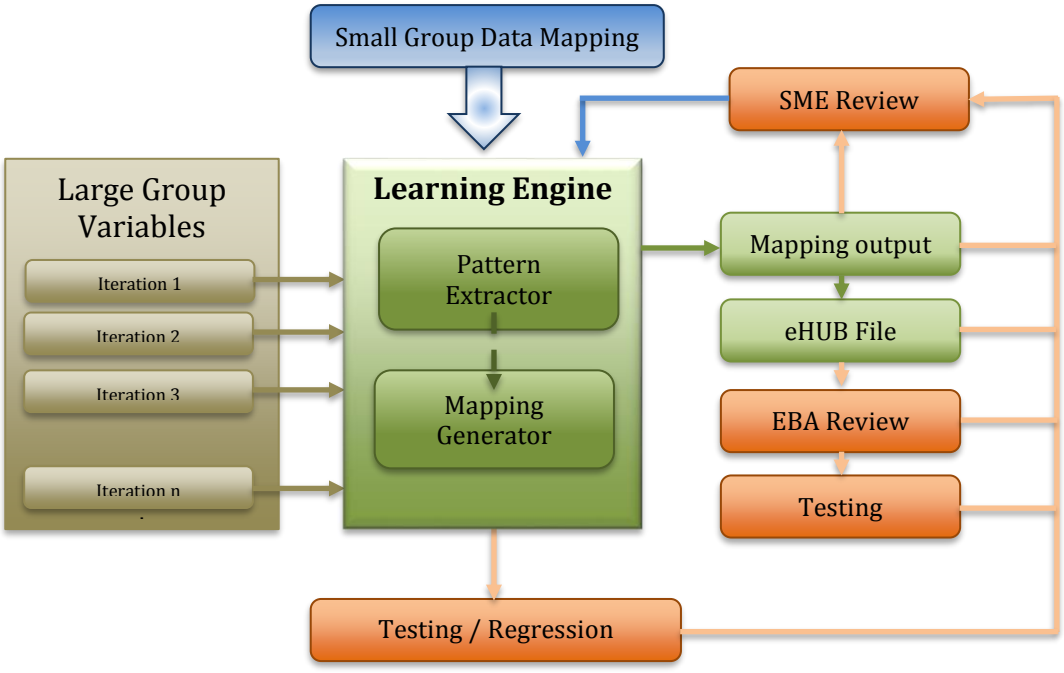
Business problem

As a part of strategic initiative, migrate data from a large group (10,000 units with 25,000 variables) to the target system by December 2016 (3 months). It is impossible to meet this deadline with existing manual mapping process as it took about 6 months for a small group (800 units with 4000 variables). (Business Problem # 115)

Pain Areas

- Manual effort - took about 6 months to map 800 units with 4000 variables for small group
- Reviews are intensive – mappings are manual based and needs intensive reviews
- Concurrent usage challenges to keep track of all business comments, guidelines, scenarios, errors, resolutions / decisions in the past resulting in
  - Duplication of effort with concurrent usage – same benefits mapped on different contracts
  - Mismatch in mappings of same variable on two different units

Solution and Features



Value Proposition

Time to Market	Improved Efficiency and Quality	Improved traceability	Cost Savings
Automating the manual process results in quick turn around and time to market	Mapping rules can be defined for a set of benefits Avoids Duplicate manual effort and errors on mapping mismatch	The generated mapping can be versioned and allows improved traceability	Reduction in review comments by 50% Defect reduction by 75%

Mockup screens

Mapping rule file

Rules are documented in the format on the mockup and is used as an input the Mapping Generator. This file allows versioning and traceability of rules.

```
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        </matchcriteria>

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                <level3>
```

Mapping Results

Minor Heading	Variable	Desc	Spider Hierachy
PROFESSIONAL S/A	PSAMMDED	MAJOR MED DEDUCTIBLE WAIVED	Physician_MedSvcs>Counseling>BehavHealth>SubstanceAbuse
OBSTETRICAL BENEFITS	PINPREDEDWVD	INITIAL PRENATAL MM DED WVD	Physician_MedSvcs>ExamVst>Maternity>Prenatal
PHYSICIAN HOME/OFFICE	OPHOPCT	PHO PAY	Physician_MedSvcs>ExamVst
OBSTETRICAL BENEFITS	NFAMCPYACPMX	FAM PLAN PAY AFTER COPAY MAX	Physician_MedSvcs>Counseling>FamPlanning
PHYSICIAN HOME/OFFICE	PPHOPCT	PHO PAY	Physician_MedSvcs>ExamVst
PHYSICIAN HOME/OFFICE	PINJADMDEDWV	INJECTION ADMIN MM DED WAIVED	Physician_MedSvcs>Injection>Immunization>Routine>Administration
PROFESSIONAL SA	NPRFSADLMXDY	PROF SA MAX PER DAY	Physician_MedSvcs>Counseling>BehavHealth>SubstanceAbuse
WELL WOMEN/MEN/ADULT BENEFITS	PWLWNCOPAY	WELL WOMAN COPAY AMOUNT	Physician_MedSvcs>ExamVst>Routine>WellWoman
PHO CONSULTATIONS	DEDWVAOVL	MM DED WAIVED AFTER OV LIMIT	Physician_MedSvcs>Consultation
ADULT PREVENTIVE CARE	ARTRGE8COVIS	ADLT PRV RGE 8 COLORECTL VISUALI	Physician_MedSvcs>ExamVst>Routine>ColorectalExam
PHO CONSULTATIONS	PCONVSTDWV	MM DED WAIVED CONSULT VISIT	Physician_MedSvcs>Consultation
PHYSICIAN HOME/OFFICE	CPHODDWV	DED WAIVED PHO	Physician_MedSvcs>ExamVst
PHO CONSULTATIONS	CONPCT	PHO CONSULT PAY	Physician_MedSvcs>Consultation
WELL BABY & WELL CHILD CARE	AXLABNPAR	CHILD IMMUN XRAYLAB	Physician_MedSvcs>Injection>Immunization
PHYSICIAN HOME/OFFICE	PPHOVISEXMCV	VISION EXAM COVERED	Physician_MedSvcs>ExamVst>Vision
PHYSICIAN HOME/OFFICE	APHOVISYROCC	PHO VISITS PER CY	Physician_MedSvcs>ExamVst
ALCOHOLISM/DRUG ABUSE	PNIPALSAPCT	NON INPATIENT COUNSELING PAY	Physician_MedSvcs>Counseling>BehavHealth>SubstanceAbuse
OBSTETRICAL BENEFITS	NPROFMATPAY	PROFESSIONAL MATERNITY PAY	Physician_MedSvcs>ExamVst>Maternity
SERIOUS MENTAL ILL/BIOLOGICAL BASED	ASRVBBOUTPT	OUTPT SERIOUS MTL/BIOLOGICAL PCT	Physician_MedSvcs>Counseling>BehavHealth>MentalHealth
PROFESSIONAL N/M	PNMOVSPCCOP	PROF N/M OFFICE VISIT SPEC COPAY	Physician_MedSvcs>Counseling>BehavHealth>MentalHealth
OUTP MENTAL DAY CARE	POTPTCARECP	OUTPT CARE COPAY	Physician_MedSvcs>Counseling>BehavHealth>MentalHealth
PREV CARE/HEALTHYCHECK PROGRAM	HCCTR19UPCOV	HLTHYCHK PGM SRV 19 & ABOVE COV	Physician_MedSvcs>Counseling>Routine Physician_MedSvcs>ExamVst>Routine
PREVENTIVE CARE	PREVDOLMAX	PREV CARE SVCS CY DOL MAX	Physician_MedSvcs>Counseling>Routine Physician_MedSvcs>ExamVst>Routine
			Physician_MedSvcs>Counseling>Routine

9. Loss Prevention

Applicable Industry/Scenario– *Retail*

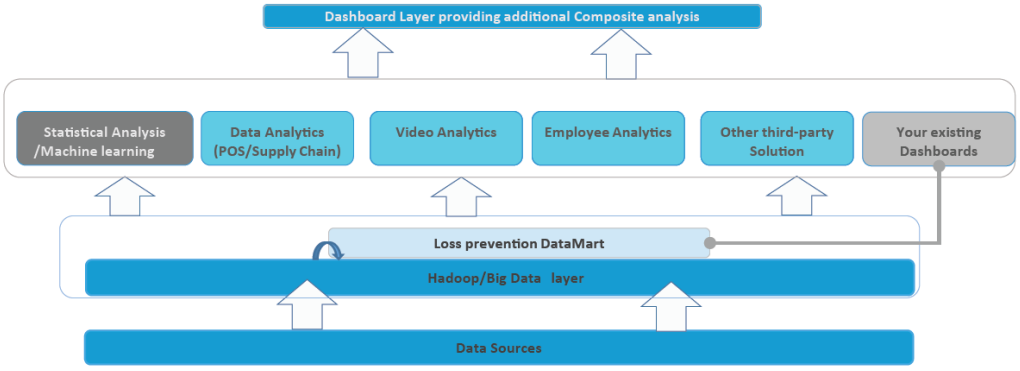
Business problem

Implement solutions/processes to reduce Shrink that results in loss of more than 1.6% of top line, due to theft and dishonest employees and also due to supply chain and administrative misses losing products during the warehouse to consumer journey. (Business Problem # 24)

Pain Areas

- Cash Outturns - Transactional Fraud Activity on the Till charged versus what is banked
- Voucher Loss – purchases made by voucher versus the payments from voucher company
- Stock Loss (pharmacy and retail) – Anywhere in the Supply Chain, including stores
- Lost Pharmacy Payments – Not claiming for scripts/services that have been provided, expenses fraud, online fraudulent activity, unsanctioned eBay activity

Solution and Features



UST Global's Loss Prevention Platform (LP NOW) delivers a dynamic, scalable and highly responsive cutting edge solution that is a culmination of years of experience and expertise.

Key Features

LP NOW Platform helps address various aspects towards loss prevention

- Traditional monitoring and analysis of losses at various points of retail operation including Point of Sales, eCommerce, inventory and supply chain
- Provides Video Analytics monitoring, which combines Video surveillance with POS and instore sensor and Video monitoring to handle object tracking and Shoplifter's face surveillance.
- Addresses Cyber security and Cyber activities threats through Cyber security monitoring that includes user behavior analytics and anomaly detection in entire retail operation
- Cutting edge technology involving BigData, Hadoop, Data Warehousing and real-time analytics.

Value Proposition

Time to Market	Advanced features and analytics	Advanced Shrink management
Integrated solution, continuously adaptive, modular, easy to implement and cost effective	The user interaction is handled through advanced features in workflow, case management, data discovery and data visualization engine with real-time analytics.	The Platform is designed to successfully manage Shrink at every level

10. Talent Management, Training and Onboarding *

Applicable Industry/Scenario

This is primarily applicable to verticals such as Retail, Logistics, Transportation and Manufacturing where continuous training of workforce in the field and providing them with context assisted help is essential for improved productivity.

Business problem

Our client, the largest retail chain in the world, on-boards an average 100,000 DC (Distribution Center) associates every year. Currently new associates are trained through videos, shadowing co-workers and other modes. Even after the initial training, the associates takes 1 to 2 months to be proficient, shadowing senior colleagues, getting inputs and directions from DC managers. There is also an unaccounted number of hours spent by the senior associates to handhold the new associate. Any gains in associate productivity through better training methods will result in significant cost saving for DCs.

Moreover, the retail sector has been experiencing staff turnover at a rate of about 40-50% per month, which will result in huge knowledge gaps and increased training expenses. (Business Problem #119)

Pain Areas

- Finding appropriate talent from the market
- Overall training cost runs up to $40 - $50M per year approximately
- Increased time to attain proficiency resulting in efficiency issues at DC
- Increased knowledge gap and training costs due to employee attrition

Solution and Features

UST came up with the following MVC for addressing the business problem.

The MVC envisages a Talent Management Platform which addresses the problem in five distinct phases as described below:

a. Pre-hire prospective candidates

Pre-hiring process starts with defining various channels for candidate identification. One of the following channels can be utilized for any prospective talent identification

- Historical database of associates (ex-associates, temporary workers)
- Referral database (employees as well as members)
- Social media watch-out
- Associates from other departments (Opt-in programs)
- Open Market

Once the channels are identified, solution provides multiple options to communicate and engage with potential candidates. This shall include emails, fliers, social media posts, coupons, puzzles and games.

b. Recruitment and onboarding

Solution gathers a candidate's social score from various Social platforms so as to conduct a first level of filtering. Solution then interfaces with existing systems to complete the selection process of the candidates, and perform the required background verification process.

Selected candidates will be taken through the on-boarding process as a paperless activity. Candidate will also be enrolled for self-paced training and continuous assistance through web/ mobile channels.

c. Training

Training associates is proposed to be implemented following the steps mentioned below:

- Setup Workflows and Activities

An Administrator defines the workflow maps for various roles within the DC through a Central Administration Console. Each workflow will have multiple activities associated with it performed by associates in DCs.

- Content Set-up through Central Admin Console

Once the workflows are defined, learning contents can be attached to the activities within the workflows. Metadata will be created for each learning content. Contents will include instructional videos, PDFs or formatted descriptions (FAQ, Tips and Tricks). It is also possible to setup proficiency tests for various workflows. At any point of time, proficiency tests can be assigned to associates along with a timeline.

System will allow to categorize learning contents based on knowledge levels, so that contents can be rendered based on the current knowledge level of associates.

- Access Workflows and Learning Contents

Upon successful login, an associate can view all activities in the workflow that he/she is currently deputed to perform in the DC. Selecting an activity allows the associate to access the learning materials, FAQs, instructional videos etc. Contents can also be saved for offline learning

- Share Learnings and Best Practices

Solution allows an associate to share a best practice or a new on-the-job learning with peers. Associates has the option to "like" a learning so that best liked learnings can be rewarded.

- Mentoring programs

On clearing a quiz or proficiency test, an associate can opt to enroll as a mentor for specific topics. System will maintain a pool of "mentors" across DCs (Global Mentor Pool), so that associates can contact these mentors in case of any assistance required.

- Contextual Assistance

Another important feature of the solution is to provide assistance based on contexts. Contexts could be a Geo Location of an incident, Mark-up Scenes, Named Locations in a DC that are readable through QR code and Beacons. Learning materials can be attached to various contexts through the Central Administration console.

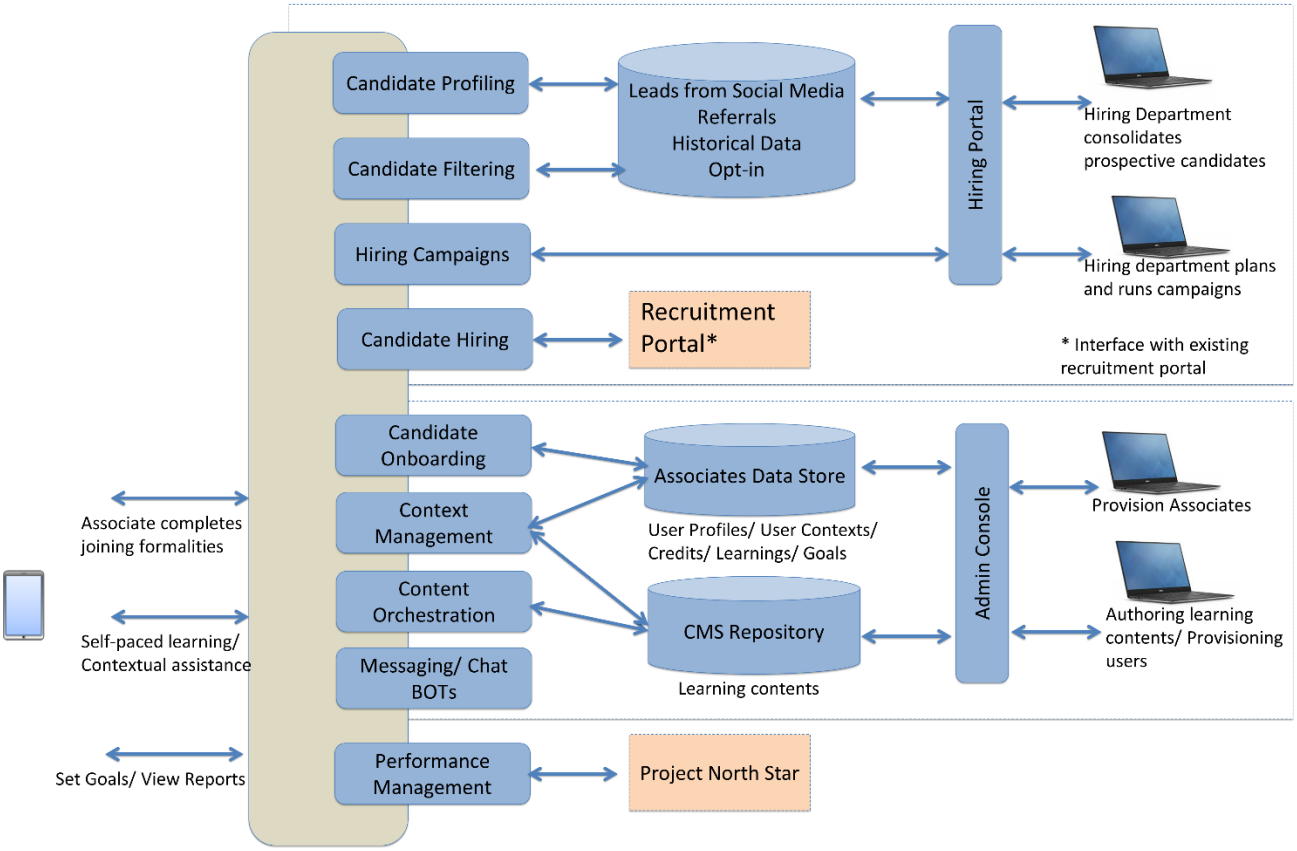
An associate can type in key words to avail associated learning materials quickly. He/she can also scan a live scene in front of them, which will then be linked to a context keyword so as to provide assistance in dealing with the situation. Context can also be communicated based on proximity to beacons. System provides options for an associate to engage in a hands-free conversation with a mentor for live assistance.

d. Work Days

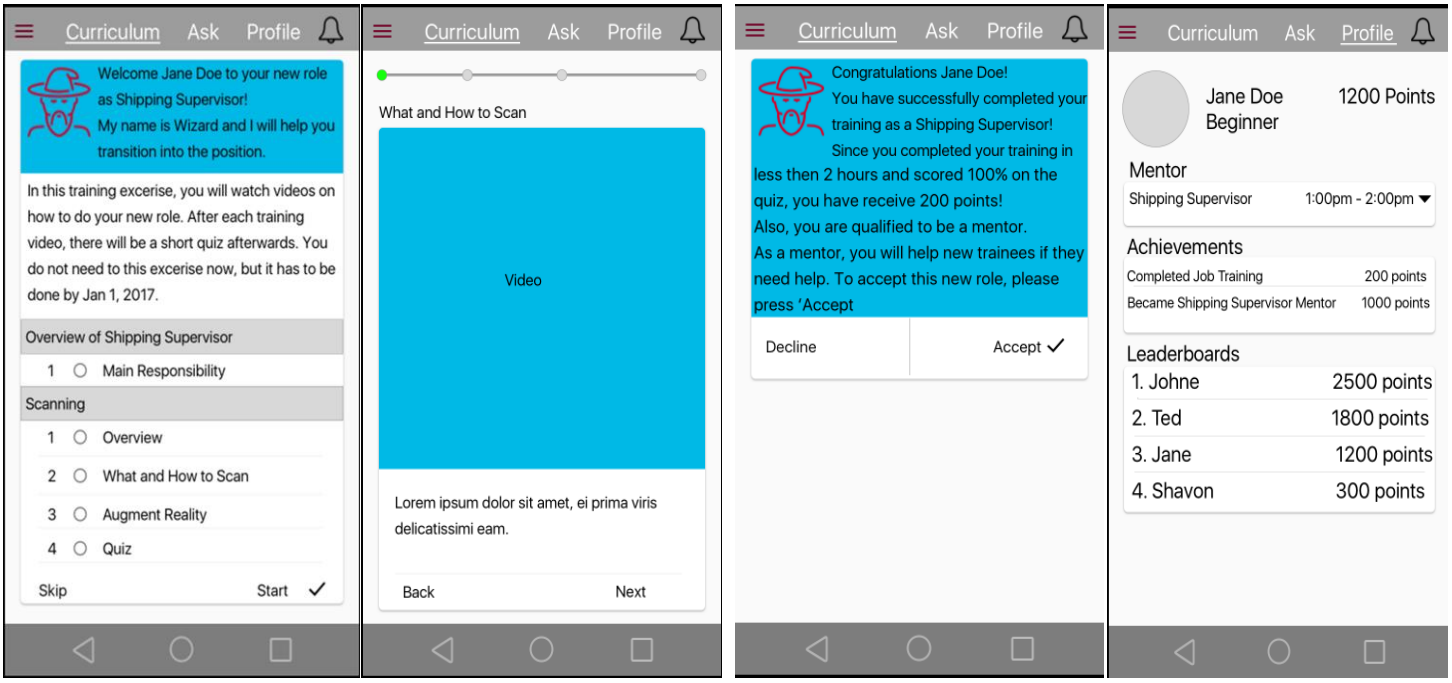
While the associates are performing their day-to-day activities in the DC, system shall capture the workday data of the associates. This includes potential video monitoring of activities within workplaces, gathering mistakes/slips that are frequent in a workflow, gathering manager feedback on associate activities, and connecting associates with the "go to guys" (mentors) in DCs. Based on the feedback and learnings, the training contents shall be updated or even personalized for associates.

e. Performance goals and monitoring

UST's project "North Star" will be leveraged for the overall performance goal setting and tracking. System will attempt to consolidate the credits accrued on account of proficiency tests, sharing tips/tricks, as well as utilizing them. Attempt will be done to keep track of how an associate is making use of contextual help for workplace issues, as well as the usage patterns.



Screen Mockups



Value Proposition

Item	Description
Work Efficiency	○ Helps associates to become proficient in a faster manner so as to increase efficiency at work ○ Significant productivity gain of associates as contextual assistance is made available, thereby reducing the need of contacting a senior associate for help ○ Employees given an opportunity to become mentors, thereby add to more loyalty and engagement
Talent acquisition	○ Widen the net for candidate search and enhanced candidate scrutiny through social scores ○ Paperless Onboarding process
Financial Savings	○ Direct benefit to the client could run into $40-$50 M / year on rough order of magnitude ○ Client, with approximately 500,000 hourly workers, could save up to 1 billion as indirect benefits
Enhanced Digital Footprint	○ Uses smart phones and existing handheld device, no additional investment on hardware ○ Digitized training contents made available at users' finger tips with a few clicks, always available, anywhere ○ Continuous feedback for performance management

11. Development Process Automation *

Applicable Industry/Scenario

Any industry scenario where Development Process to be automated where the input provided are PDF templates.

Business problem

Leading Healthcare provider in USA has a set of recurring requirements to accept enrollments for Medicare members. An automated solution would be very effective since the existing process is effort intensive, time consuming and incur significant cost. (Business Problem # 142)

Pain Areas

- Small time window for IT team to make the system ready to accept new enrollments every year
- Too much IT cost is involved for implementing the recurring changes in the system every year
- This process involves lot of manuals steps and is effort intensive
- Human errors while handling member demographic and related data

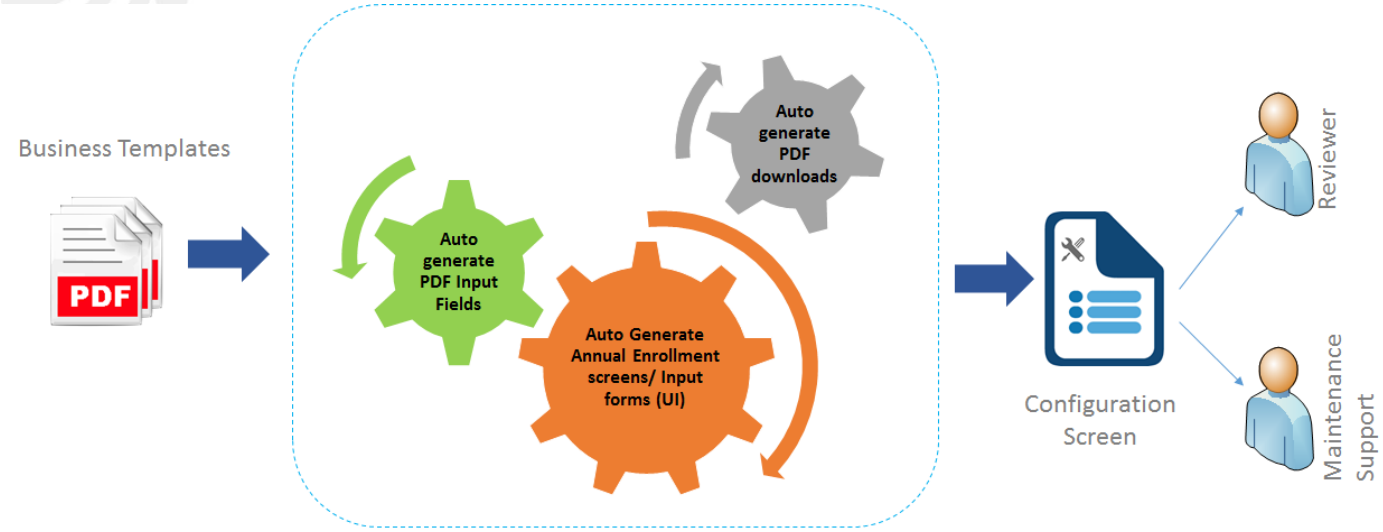
Solution and Features

Main Idea is to have end-to-end automation of annual maintenance process up to a coverage level of 70-80 % of current manual work.

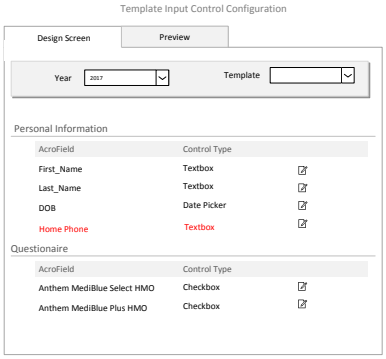
Automate PDF template input field generation	**Automate UI Generation**	**Provide maintenance screen to configure Template and UI generation**
Existing manual transformation of business provided PDF templates to editable templates can be Automated. Dynamic generation of these templates can also avoid the comparison of templates with previous year	Coding changes which is done currently as part of AET maintenance can be avoided. UI for the new year can be auto generated based on the templates provided by the business. Here also we can avoid comparison of templates with previous year.	Maintenance screen to manage Template and UI generation can be provided, so that any manual corrections (if required) from the automated data can be done easily without code change.

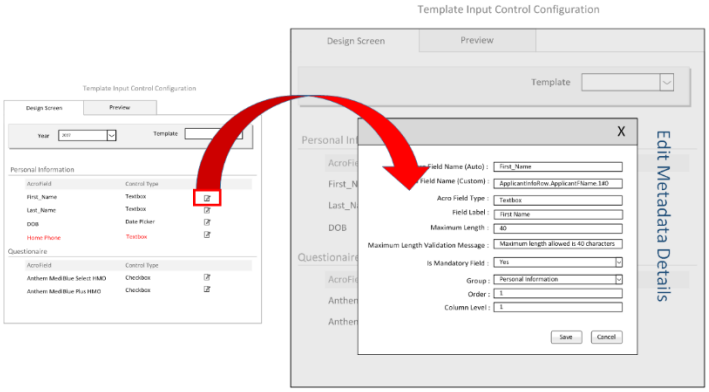
Value Proposition

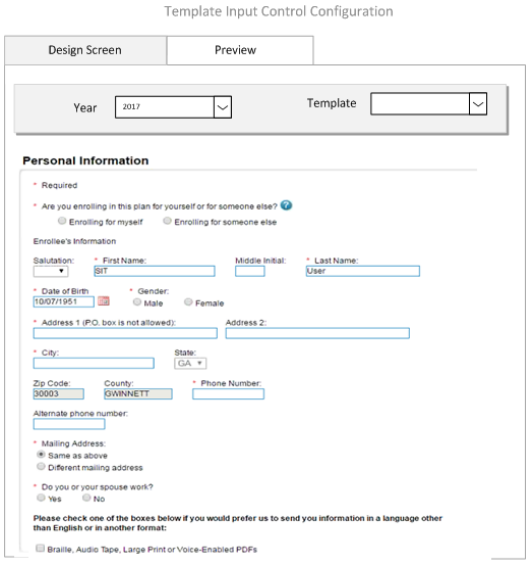
- Configurable system for new enrollments that can cater to future requirement
- Less dependency on IT team
- Eliminate AEP build out cost every year
- Less prone to manual errors as it involves minimal manual intervention
- Solution can save 70-80 % of maintenance cost annually based on the current assumptions



Sample Meta Data Configuration Screens







12. Automating PDF Content Validation *

Applicable Industry/Scenario

Any industry scenario where programmatically generated (using AcroFields) and flattened PDF files are to be validated automatically.

Business problem

Leading Healthcare provider in USA has a challenge in Automating the validation of PDF content. The PDF is getting flattened before it is made available for testing and hence the fields containing the data is not programmatically readable. Currently the automation has a roadblock because of this situation. (Business Problem #170)

Pain Areas

Test data management is already a challenge across several portal areas. Since the Test automation initiative is on hold because of this problem, it will affect the entire IT which will affect cost, time and accuracy of Testing.

Solution and Features

Solution is to make an additional layer in the PDF generation process. First we need to create an intermediate file which is a simulated flattening of PDF file by making all AcroFields as read-only. This version of PDFs can be used for test Automation by programmatically reading the values of AcroFields. Second step is to generate the flattened PDF. Now we can compare simulated flattened PDF and actual flattened PDF using OCR techniques and thus fulfilling complete end to end test automation.

Value Proposition

Solution will open up opportunity in Test Automating Several Portals which uses PDF Content Verification, where the current process flattens the PDF.

Solution indirectly brings savings in cost and time by removing road block faced by the Test Automation Team.

Time to Market	Better quality to production
Automation of PDF Validation helps quicker validation of 300 plus PDF files for each release.	100% validation of files before every production release. Manual errors minimized with Automation of PDF Validation

13. System Modernization *

Applicable Industry/Scenario

This is applicable to any enterprise solutions irrespective of the vertical, where the current systems are built as a monolith thereby greatly impacting the flexibility, maintainability and business agility.

Business problem

Workforce Solutions is one of the highest revenue generating streams of our client, which is one of the major Credit Rating Agencies in the US. They are facing a huge challenge with currently used application suite in terms of scalability, maintainability and extensibility, because a majority of these applications are built using a monolithic architecture. Moreover, the monolithic nature of the applications is preventing the client from providing an Omni-channel experience to its customers especially through the mobile channel. (Business Problem #146)

Pain Areas

- Architecture Flexibility and Scalability – Applications are mostly built using monolithic architecture with business logic spread across ASP pages, middleware and database stored procedures
- Business Agility – Monolithic nature of the applications is greatly impacting the time to market for introducing business changes or new features
- User Experience – User experience is not optimized based on user personas. UX drastically varies when a user switches from one application to another. Moreover, these applications supports only type of UI and does not allow optimization based on user personas

Solution and Features

UST proposed migrating the applications from its current state to a Microservices based architecture along with revamping the UI optimized based on user personas. A formal definition of Microservices suggests that the exposed service should be an independently build-able and testable entity that can be deployed in its own container, and preferably manage its own database. While a fully compliant Microservices based architecture is the ideal end state, it is recommended that this ideal end state is achieved in multiple steps. This is primarily due to the fact that there are several other applications that depend on the current data model, hence a data model re-engineering is not immediately practical unless all those applications are also brought on board.

First step of the multi-step transformation process is to transition the current state to an intermediate state (a “Proposed State” for which the timelines and resource requirements are identified) where a Microservices philosophy will be followed to define and build the services around the required business capabilities, with keeping the current data model intact. It is also proposed that each of the services is independently hosted in its own process. Subsequently, the data model is revisited and re-engineered so that each microservice independently handles its own data.

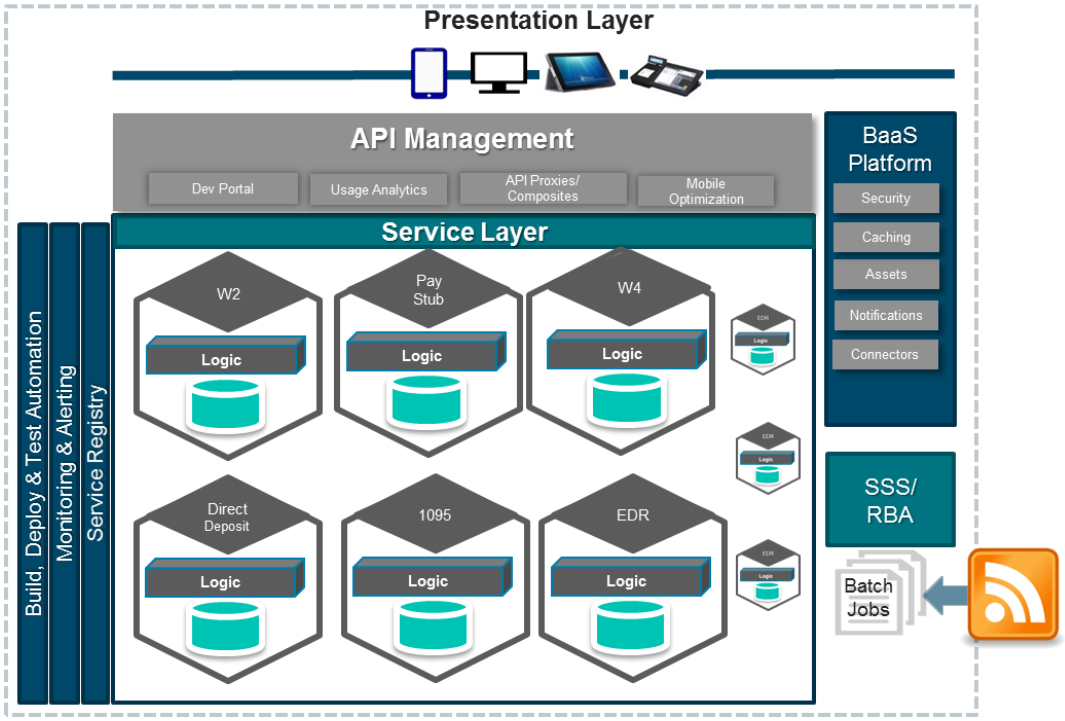


Figure 1: Ideal End State

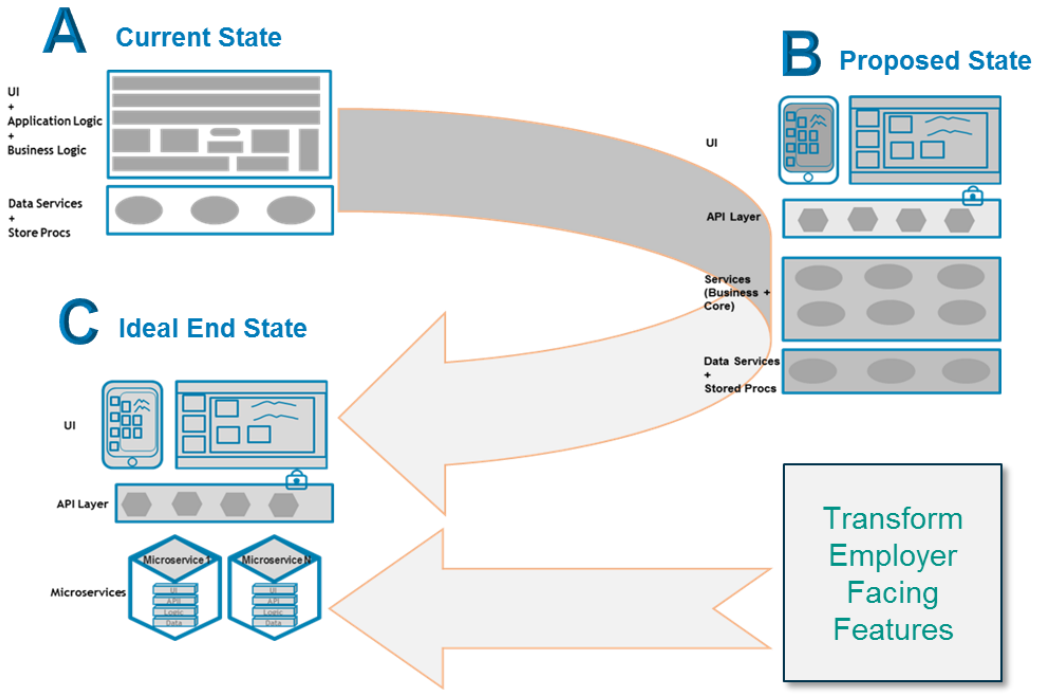


Figure 2: Transformation Path

The presentation layer is proposed to be implemented as a Single Page Application (SPA) using HTML, CSS, JavaScript (Angular JS), which are proven Web application development technologies. Considering the consumer facing requirements, it is concluded that user experience is extremely important while delivering an optimal performance. A platform which enables reusability, still delivering acceptable performance is recommended in this perspective. Following two options are suggested for the mobile client implementation:

- Ionic with Angular

- Xamarin

With API management and potential API monetization as key requirements of the modernization exercise, our strategy was primarily based on identifying an industry major API management platform, which can also provide BAAS features. APIGEE Edge, the popular API management platform with its recently added BAAS capabilities is strongly recommended for hosting the services exposed by a transformed application suite.

Value Proposition

Item	Description
Consumable API services	○ Potential new revenue streams ○ Make the services available through multiple channels
Improved automation and release cycles	○ Improved time to market bringing in more business agility
Improved user experience	○ UI completely separated from the business layer ○ Multichannel experience, persona based UI ○ Various types of UI's enables connection to common service tier
Improved scalability and maintainability	○ With clear separation of concerns across presentation, business and data layer, the application becomes more maintainable and scalable ○ Reduced technical debt

14. Write Motive for Sales *

Applicable Industry/Scenario

This is applicable to any industry for continuous improvement in sales activities of various products and services.

Business problem

There are Sales Personnel in the field working along with various healthcare professionals and normal customers. Client was looking for ways to continuously improve the effectiveness of sales activities. (Mob Solution)

Pain Areas

- Promote "out of the box" thinking to sell new products to customers
- Sharing of learnings and best practices

Solution and Features

UST's solution was to enable sales personnel to develop stories of their customer interactions using an iPad-based B2E mobile application, and share these stories with superiors and peers to rate them. The intention is to evaluate the effectiveness of sales activities, and reward the best stories.

The solution works in the following steps:

- ❖ Sales people are encouraged to develop "stories" around their interactions with a customer which includes various methodologies that they applied for winning business
- ❖ Share the stories with peer groups and superiors for review, rating and assessment
- ❖ Reward the top scorers every month, and publish their stories as best practices across the company

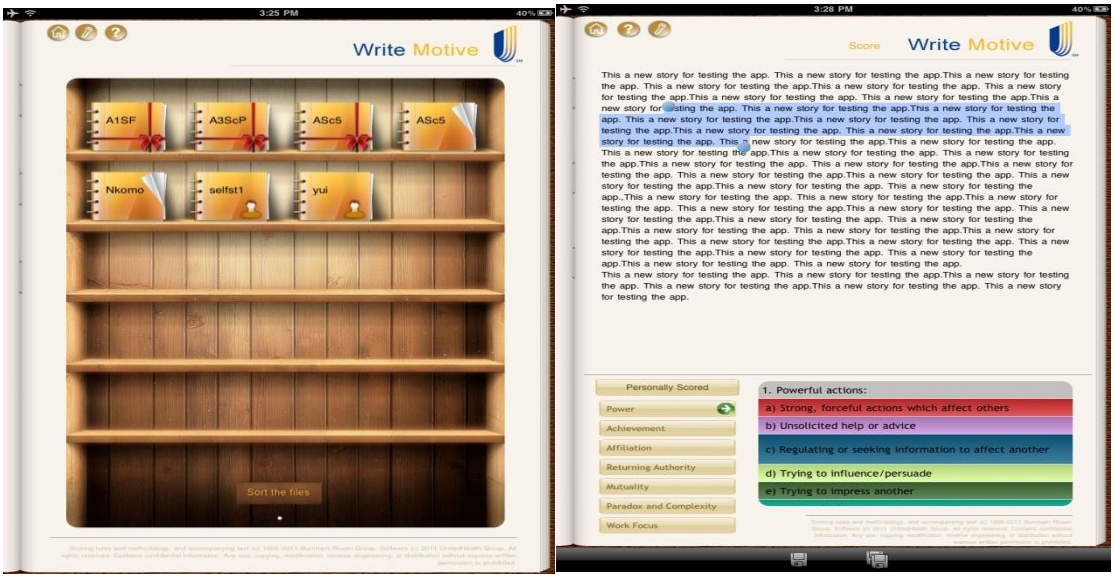


Figure 3: Transformation Path

Value Proposition

Item	Description
Improved Sales effectiveness	○ Enables collaboration among sales personnel ○ Generate a feel of achievement as the best customer-interactions are rewarded and published as a best practice ○ Learning to the peer sales personal to handle situations and demands of customer.

15. Go Paperless *

Applicable Industry/Scenario

Any scenario where field service personnel want to provide an improved customer experience.

Business problem

Client's Medical Representatives were using a web application running in laptops to collect queries and feedback on various healthcare products from Healthcare Professionals. Of late, there were a few issues noted:

- There were many occasions when the sales reps did not carry the laptops to the physician's office
- Even if they carried the laptops, the rep found it faster to have the physician fill out a paper form rather than starting the laptops and submitting the queries/ feedback. (Mob Solution)

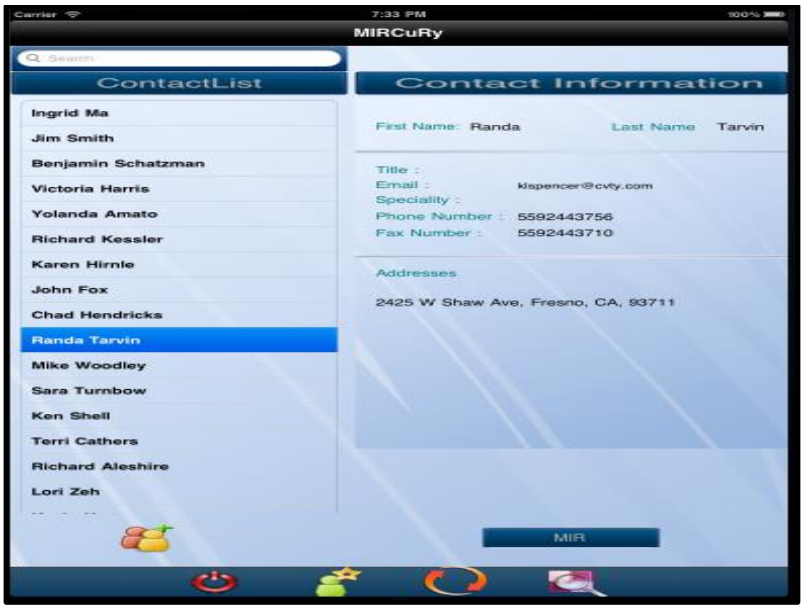
Pain Areas

- Complaints from physicians on delayed (or even missing) response to their queries
- Dependency on Laptops
- Paper form is faster and simple vs Laptop is time consuming and formal.

Solution and Features

Since the Sales Representatives are increasingly using iPhone/ iPad devices, UST saw an opportunity to redesign the business process which reduced the overall enquiry processing time from 5 days to less than a day. The solution was to make the application available on these smart devices with real-time data sync capabilities. Even in the absence of a network connectivity, the solution stored the queries offline, and later synchronized with the medical center whenever an active connection is available.

UST's solution also included a digital signature capture to authenticate a physician.



Value Proposition

Item	Description
Increased use of the application by sales reps , thereby decreasing paper based requests from physicians	Smart phones are easy to carry and have wireless connections, making them an attractive option for the sales reps
Improved response time for Medical Information Requests	

16. Digitized Screening and Eligibility Verification *

Applicable Industry/Scenario

Any industry scenario where customer screening and eligibility check are performed before providing them with a requested service.

Business problem

Our client is a major healthcare insurance company based out of US. One of the major activities performed by the client's sales representatives is to conduct screening and eligibility verification of underprivileged patients so as to make various state and federal insurance plans available to them. The current process involves collecting scores of patient data through paper forms and feeding patient data manually into the web application which is time consuming.

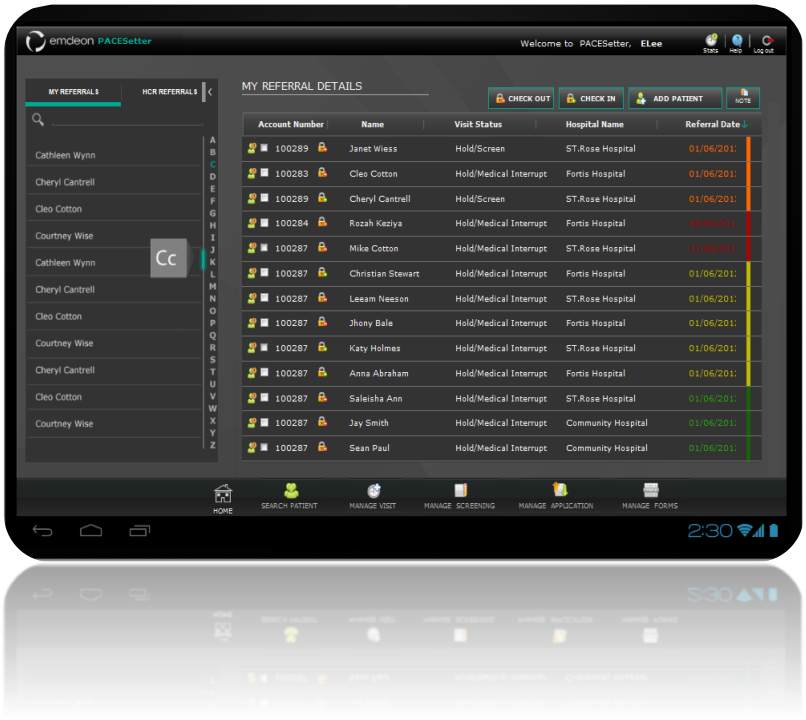
Client wanted a system which would digitalize the entire screening and eligibility check for state/federal insurance claims so that the number of screenings per day can greatly be increased, resulting in multi-million savings per year. (Mob Solution)

Pain Areas

- Tedious and time consuming process of patient screening and eligibility check

Solution and Features

UST developed a B2E end-to-end mobile solution running in SAMSUNG tablets that allowed the sale professionals to collect patient data for screening, instead of the current paper forms. A customized rule engine running in the device performs an eligibility check to confirm appropriate state/ federal plans for claims.
Based on the eligibility, one of the hundred plus insurance claim forms are picked up, and auto-filled by the application, with an option to override any entries manually by the sales representatives. Solution also allows the patient to provide input by voice. Any supporting documents can be scanned and attached as an evidence. Once the required forms are completed, it is uploaded to the server for submitting to the agencies for processing.



Value Proposition

Item	Description
Patient convenience	Greatly reduced the screening process by introducing voice to text and evidence scanning using the tablet camera
Volume of screenings	Number of screenings conducted per day is increased by three times

17. Virtual Realization of Shelf Space *

Applicable Industry/Scenario

This is applicable primarily to Retail vertical where product placements vary as part of marketing campaigns.

Business problem

Our client is one of the major retailers based out of US. During weekend sales, they put up special shelves with new products arranged specifically to attract customers based on promotions and sales. This is currently a manual process in which several trial-and-error attempts are done before a final shelf placement is finalized for the selected products. (Mob Solution)

Pain Areas

- Placing the products back and forth sometimes results in damages to labels and packaging
- Time consuming and labor intensive
- Trial and error not advised with perishable, brittle and heavy products

Solution and Features

Using the Microsoft HoloLens technology, UST developed a prototype to enable the virtual realization of shelf space and the arrangement of products on them. The user virtually arranges products on a virtual shelf(s) in front of them and then can walk around the virtual unit to check for the optimal product placement. Once satisfied, placements are performed on the real shelf.

Value Proposition

Item	Description
Multiple trials and errors with the real shelf and the products are avoided, thereby eliminating the chances of creating any damages to the product packaging or labels	Products are moved to the shelf only when a proper shelf placement plan is finalized

18. Facility Management *

Applicable Industry/Scenario

This solution can be used in the following scenarios:

- Retail Stores: Users can locate their preferred items' location inside the facility and guide them for better and quick checkout
- Hospitals: Can be used to locate various diagnostics departments, labs, pharmacy etc. We can also provide a custom search to find doctors and his/her consultation rooms
- Facilities: This solution can be employed by Fire and Safety team in a Facility to help people to locate their nearest exit doors in the unfortunate event of a fire
- Factories: This solution can be used to locate the mobile/portable factory amenities, instruments and tools.

Business problem

Enterprise running in huge buildings (like retail stores, warehouses, hospitals etc.) always face the problem of helping their employees and customers to locate various amenities such as exit routes, product locations, conference rooms, printer/fax facilities, emergency routes, escalators etc. within the building. (Mob Solution)

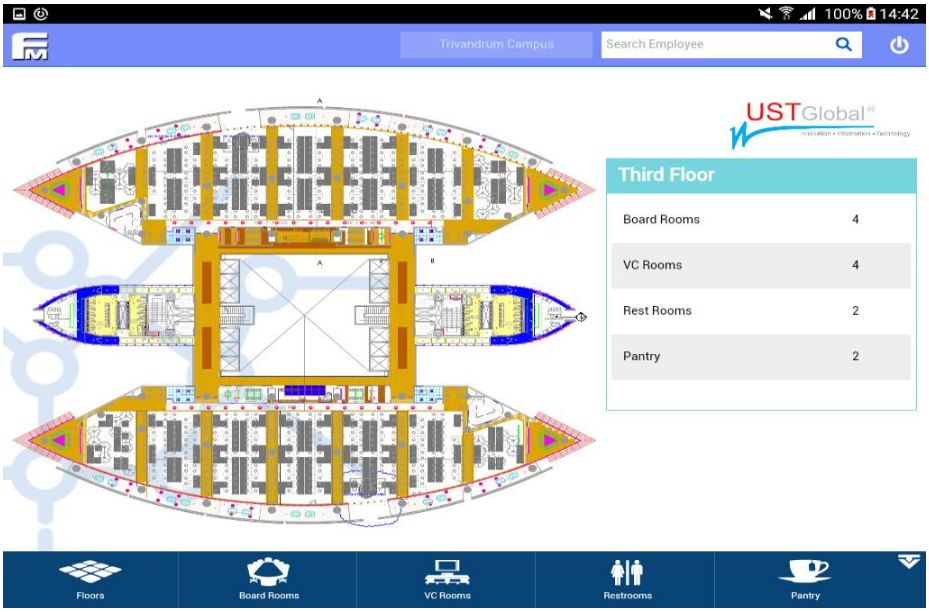
Pain Areas

- Guiding the employees and customers to various locations within the premises following the shortest route

Solution and Features

UST developed a kiosk like application that shows indoor maps of a building, and displays common amenities specific to each floor in the map. Upon searching for an amenity, a pin will be dropped on the interior map of the selected floor to indicate the specific amenity. The solution also has the capability to locate resource locations in real-time using advanced Wi-Fi based or Bluetooth-beacon based triangulation algorithms and plot the quickest route to a target within the building.

The Facility Map application is a hybrid solution developed using Ionic/Angular JS framework which is then wrapped in IBM MobileFirst. The solution uses LDAP authentication and HRMS system to fetch the employee records through MobileFirst adaptors. The app is themed using SASS for easy maintainability and performance optimization.



Value Proposition

Item	Description
Resource locator and route Guidance	Solution can be used by customers to quickly locate amenities and resources within buildings, and avail the shortest path to those resources, thereby saving time