



West Bot Hackathon

Design, Architecture, and Demo

January 26th, 2016



Microsoft Partner
Gold Data Analytics
Gold Cloud Platform

Microsoft Partner of the Year
2015 Finalist
Big Data and Analytics



Agenda

Introductions

About Neal Analytics (Company Background)	<i>5 mins</i>
Review of Your Current Situation/Objectives	<i>10 mins</i>
Bot Design Principles and Architecture - Break	<i>30 mins</i>
Bot Demos – QnA Maker Bot (OOTB), REI Bot (OOTB), Decision Tree Bot	<i>45 mins</i>
Q&A	<i>10 mins</i>

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BOT Overview

Technology Overview, Briefing, Roadmap

January 13th 2017,
Prepared by David Brown



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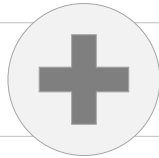


We are a specialist, Microsoft-exclusive SI(1)



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Our Mission



Drive business value with Data/Cognitive Services, IoT, and Analytics on the Microsoft platform

Our Company



We are growing, Seattle-based company with 43 management consultants, application developers, data engineers, and data scientists that have helped dozens of customers improve their businesses. We were founded in 2011

Industry Alignment



Our objective is to make Data/Cognitive services, IoT, and analytics accessible to institutions of all sizes across our verticals. Our team specializes in creation of analytical practices to help companies grow and scale

Partnership



We are a Microsoft partner that has deep and meaningful relationships within the Microsoft Product Groups and Sales Organizations. We enjoy a two-way sharing of ideas and best practices

Services



Application Development and Integration, Cognitive Services Integration, Decision modelling, field management, process and machine optimization, and predictive success management

(1) SI: Systems Integrator; Our skills include developer tools (e.g. .NET, SQL), Platform (e.g. Azure, SQL Server), and methodology (e.g. Agile, ITIL)

Why Neal Analytics?

Business
Focus



Work back from **profit drivers** to the actionable issues on which data science can provide insight or governance

Modern technical
infrastructure



We focus on **cloud-based analytics**: economy, secure sharing of results, advanced functionality and on-demand capacity

Data Engineering
& Data Science
Expertise



Our **experience** spans structured, semi-structured and streaming data sources; our data science staff includes Ph.D.'s, engineers, and MBA's

Deep Microsoft
Experience



Our practice exploits Microsoft Platforms; and we take full advantage of **our proximity and Gold Partner status** to remain current and participate in previews

Technology
Transfer



We transfer our data models to your staff and provide training on any part of the tool chain you require



Engagement Models for Neal Analytics

Project-Based Work

- Highly defined statements of work written by sales in conjunction with delivery due diligence
- Defined engagement cycle and timeline for delivery with incremental deliverables
- Works best for projects with a definable outcome and goals with organizational buy-off within customer
- Staff operates under guidance of Neal management with an engagement cadence defined in the statement of work
- Deliverable, retainer, or milestone based billing to support client needs

Managed Services

- KPIs and SLAs define the hallmark of a successful multi-year long-term outsourcing arrangement
- Ratios of people defined for tasks and job-roles enabling hybrid teaming and staffed resource scalability across multiple projects & organizations
- Staff engages under advisement of managerial lead, from either Neal or Customer who defines sprint-based engagement cadence for managed services
- Highly defined outsourced value proposition and firm-based engagement cadence
- Billing based on defined monthly engagement cadence, or paid by retainer in advance

Talent Solutions

- Skilled human across a wide range of tech skill areas to augment long or short-term needs
- Annual, monthly, contract to hire, and executive search engagement models
- ARIBA and other HR system compliance
- Wide network and ability to fill any role across data, analytics, engineering, marketing, sales, and operations
- Engagement defined by direct management of resource by customer

Services Areas

Infrastructure

- Azure Lift and Shift
 - Database / OS / Apps
 - ERP / Enterprise Apps
- Datacenter Migration Services
 - SQL On-prem to SQL Azure DW
 - Competitive win backs
- Big Data Architecture/Migration
 - Enterprise Architecture
 - Azure AD
 - Master Data Management
- Advanced Data Services
 - HPC
 - Video Services
 - PowerBI Back-end






















Data & Visualization

- PowerBI
- Azure Analysis Services
- SQL DW, SQL IAAS, SQL Azure
- Data Management (ADF, Event Hubs, Data Lake, SQL Azure DB, SQL Azure DW)
- SQL Server/Developer
- Microsoft R Server
- IOT (Stream Analytics, ML models)
- Data Warehouse (SQL Server, Azure SQL DW, Azure SQL)
- Azure Data Lake
- HDInsight, ClouderaSparkR, Hadoop Animal Farm (ELK stack, etc.)

AI & Machine Learning

- Finished Solutions available in and separate from AppSource
 - **Retail:** SKU-Max, Market-Mix
 - **Manufacturing:** Quality-Max
 - **Ops/Supply Chain:** Predictive Maintenance, Asset Mgmt.
 - **Bots:** Business process Automation, Expert System
- Special Projects
 - Advanced Analytics projects
 - Bespoke/custom engagements for a net-new scenario (\$\$\$)
 - Business/Technical Envisioning sessions
 - Executive Envisioning Workshops
 - Microsoft-based Product Optimization

Finished Solutions: Technology Scale

	Retail/CPG		Manufacturing		
Sales & Marketing	Sales Driver Analysis 	Sale/Ordering Agent 	Bots: - Sales Expert System 		
					
Product & Competition	SKU Optimization 	Pricing Optimization 	- Product support and integration 	Quality Management 	
					
Ops & Supply Chain	Stock Replenishment 	Asset Management 	- Tier 1 of Support 	RUL-Predictive Maintenance 	Field Service 
					



Complete



In Progress



Planned

Some Neal Analytics Customers ...



Objectives and Approach

Business Objectives

- **Increase personnel effectiveness** by enabling employees to find the right answer to understood questions automatically
- **Speed up action** by reducing costly delays and out of support hours gaps. Lower data access barriers, leading to faster delivery and time to market reductions for new support materials
- **Empower employees** by creating additional time for intellectual and creative resources to focus on high value activities such as strategy and innovation



Approach

- **Translate** Business logic and information system architecture into a graph that can be searched and traversed using a chat bot
- **Integrate** bot and data sources so ERP data can be consumed and leveraged by chat bot
- **Train** artificial intelligence systems to understand English expressions and translate them into commands to retrieve information from the program
- **Humanize** interface by adding emotion to responses and leveraging common user interface (Skype).

Advantages of Bot Automation

Better Improved Accuracy/Compliance

- Improved compliance with FastTrack processes from people (users & support agents) wanting to engage
- More accurate outcomes from better policy adherence & knowledgebase adherence
- Reduced tactical mistakes due to improved availability of information
- Improved Scale of Service (out-of-hours support)

Faster Time Savings

- Response turnaround reduces to minutes
- Efficient navigation to the answer, no need to peruse FAQs
- Improved speed of execution due to easier access to needed information, systems, forms, and other FastTrack processes
- Up-leveling valuable personnel from route tasks to value-adding activities

Cheaper Lower Cost To Serve

- Lower FastTrack help desk costs
- More efficient usage of help desk time through tiering of issues
- Improved ROI of FastTrack groups due to more time spent on high value strategic initiatives

Key BOT Use Cases

Process Automation & Expert System



- Programmatic hooks into process database with write-back capability
- Expert process knowledge to facilitate process progress and adherence
- Distinct pathing and expertise in order to answer questions
- Reductions in processing time due to 24/7 availability of an expert
- Ability to integrate with other BOTs and systems.

Support Response Automation & Q+A



- Azure Search configured over highly relevant content provides a seamless way to do deep indexing
- Existing Q+A features and ability to store historically successful answers enable great email & chat support
- Scalable BOT allows for support staff requirements to remain minimal as companies use technology to scale

Automated Sales

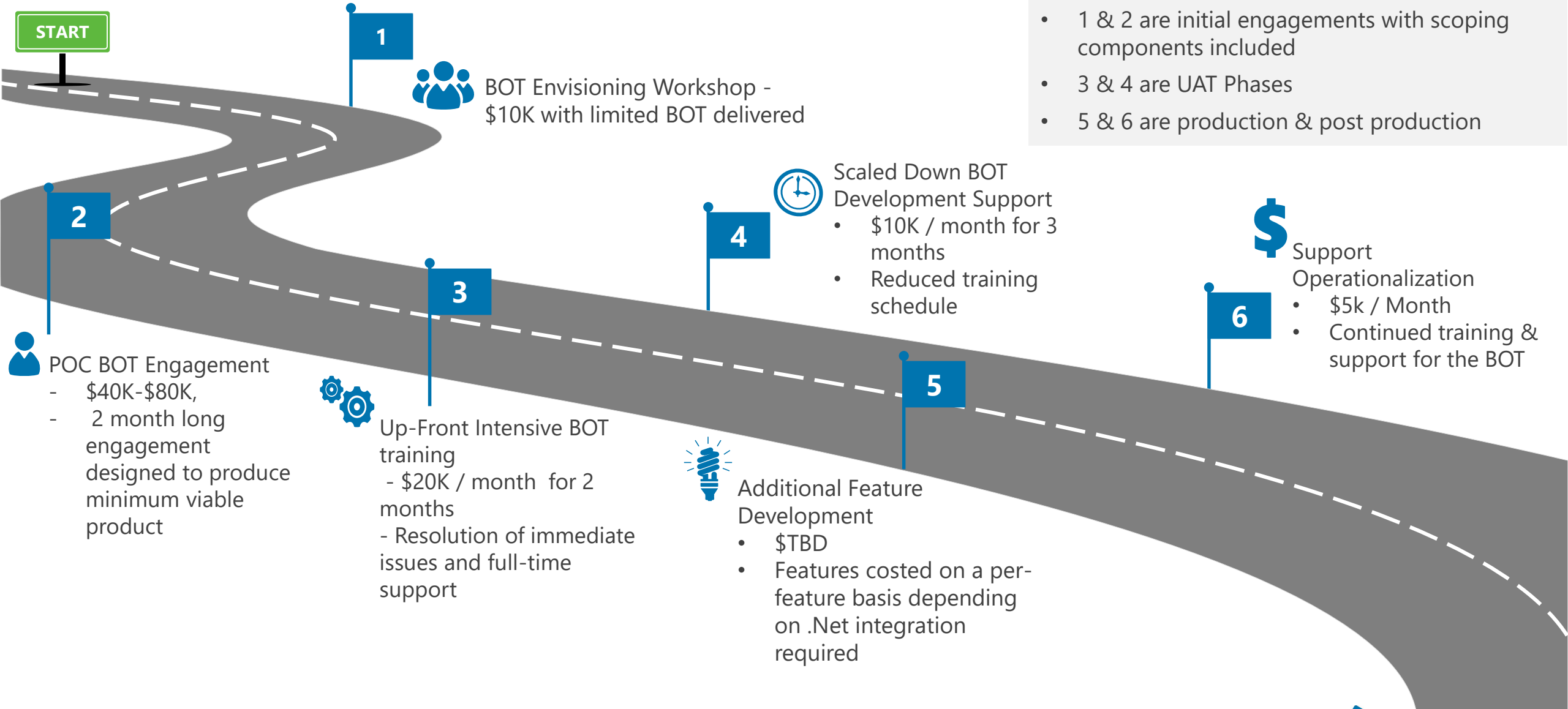


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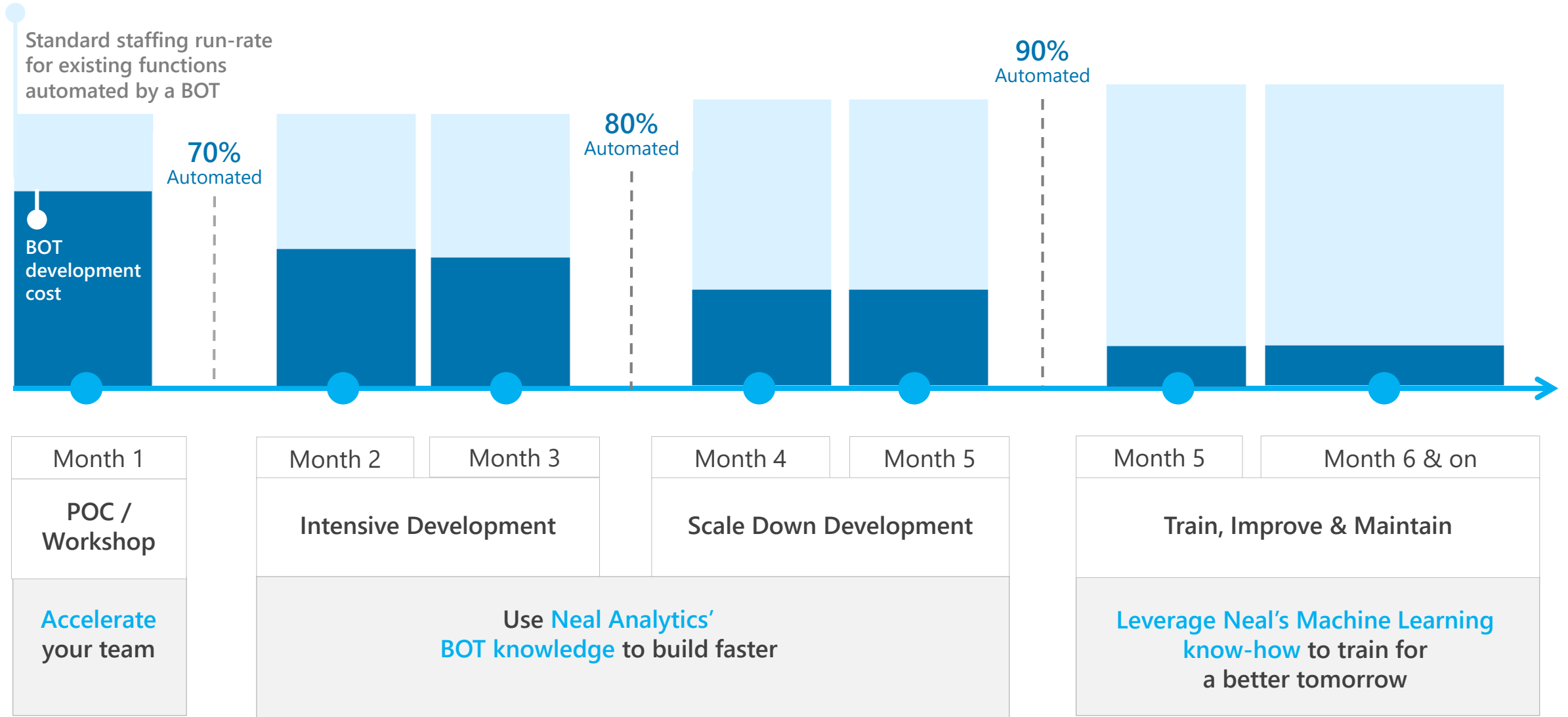
Typical BOT Roadmap - Services

Key

- 1 & 2 are initial engagements with scoping components included
- 3 & 4 are UAT Phases
- 5 & 6 are production & post production



BOT Acceleration Managed Service Value



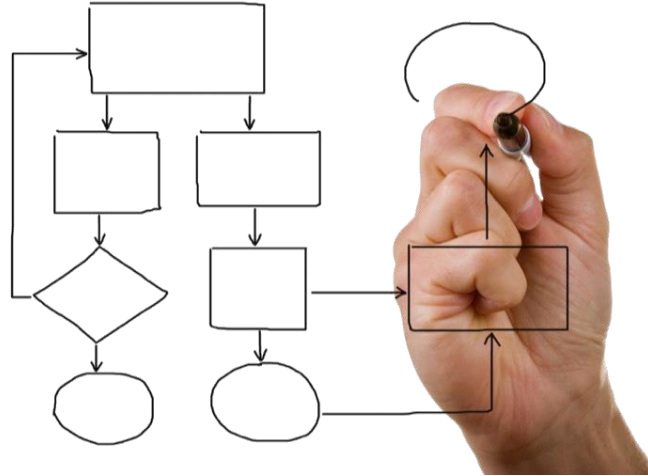
Three Paths to Bot Interaction

1 Natural Language



Bot respond to direct questions related to procurement in conversational form

2 Business Process



Bot follows business logic matching desired procurement process

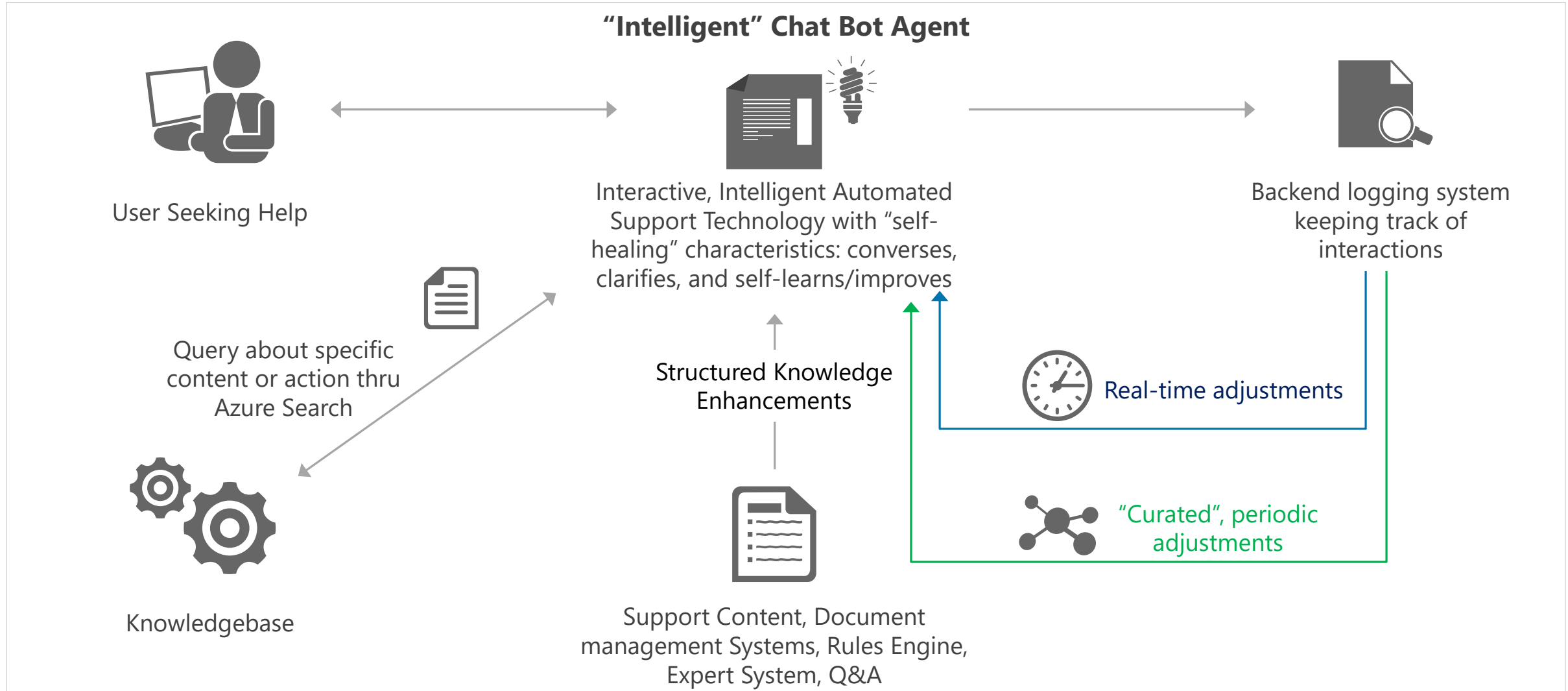
3 Logic Programming

How to make tea?

Organise everything together;
Plug in kettle;
Put teabag in cup;
Put water into kettle;
Wait for kettle to boil;
Add water to cup;
Remove teabag with spoon/fork;
Add milk and/or sugar;
Serve;

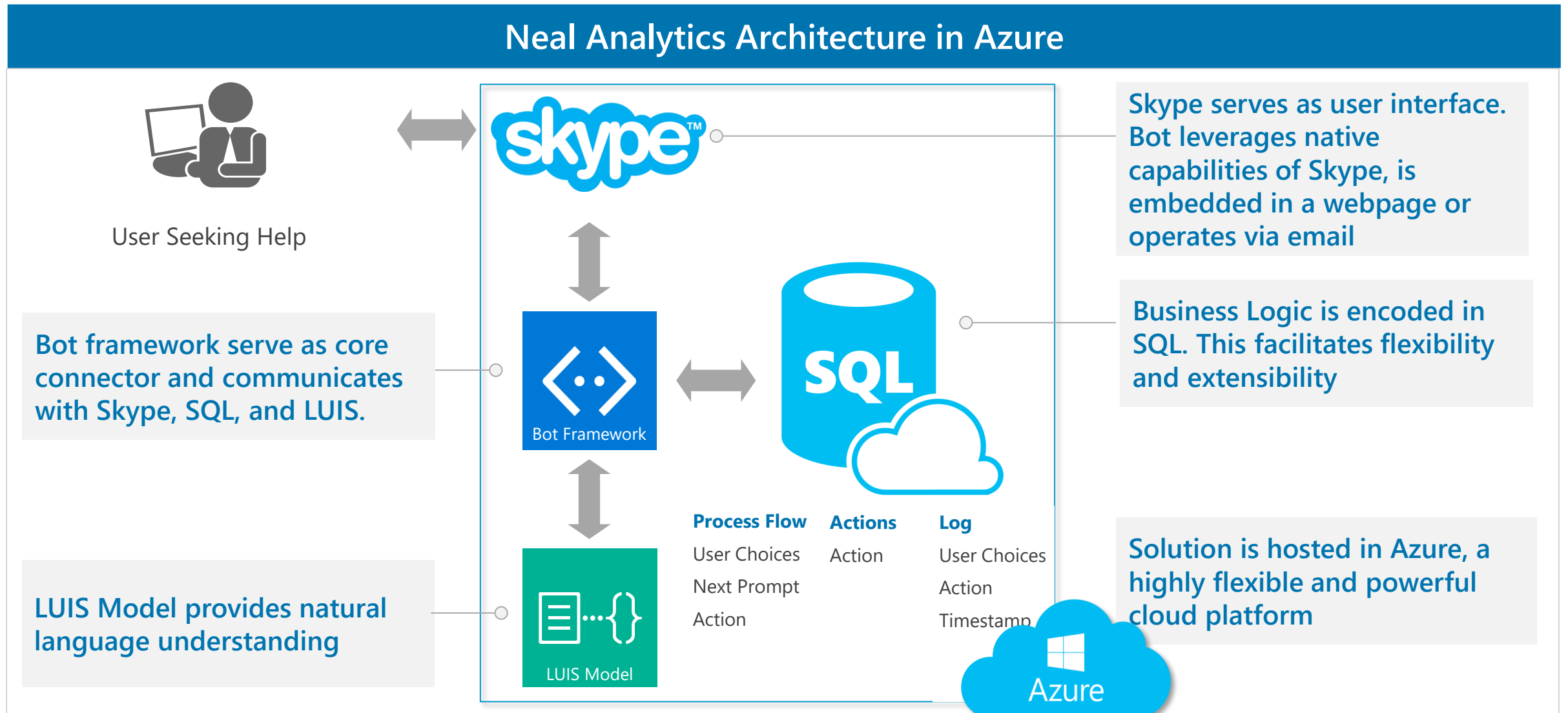
Bot can be updated by uploading simple instructions into a database

Bot Conceptual Architecture – Helpdesk Agent

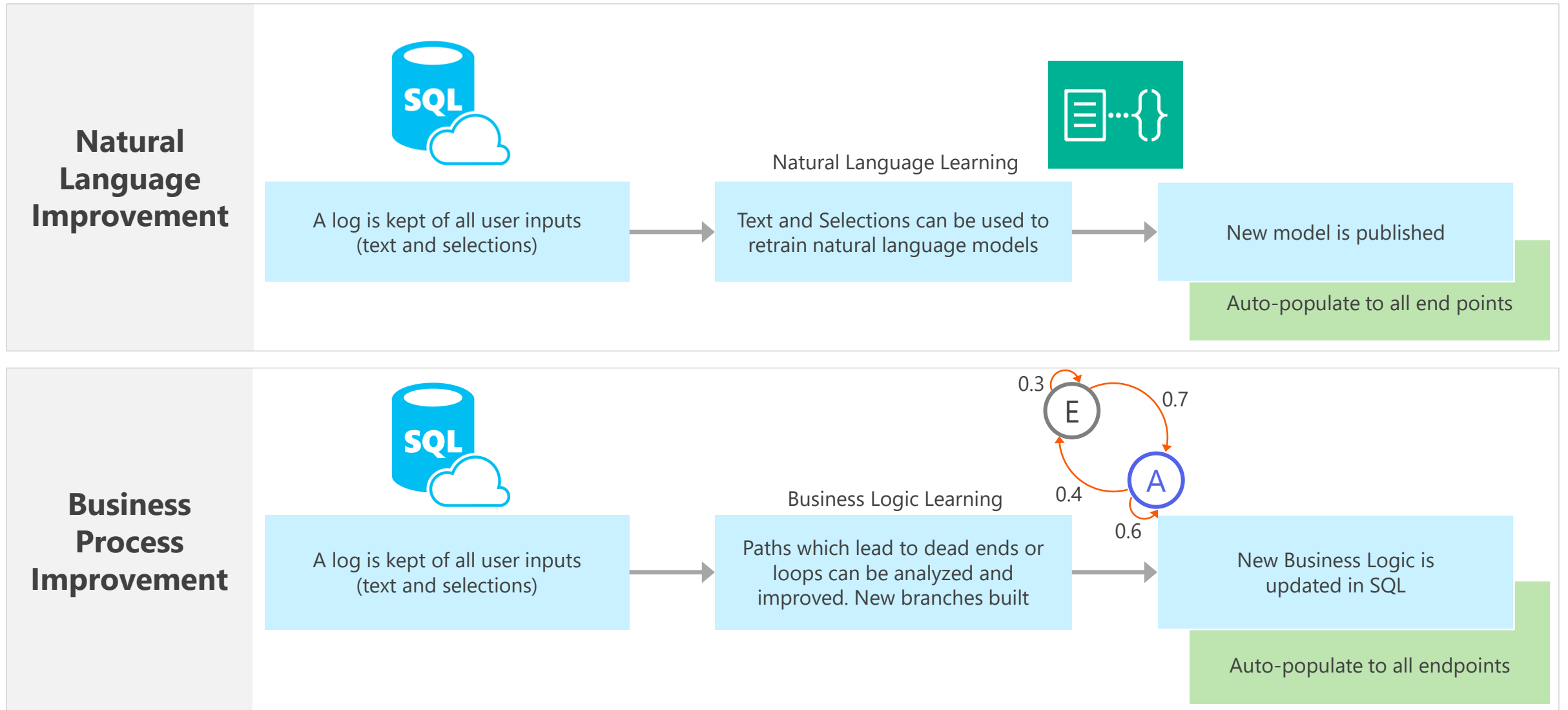


**Unconstrained* "Art of the Possible, Budget & Timeline no bar*

Bot Technology Functional Architecture – Process Bot








A System That Grows Smarter With Use





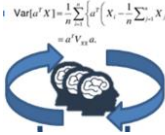



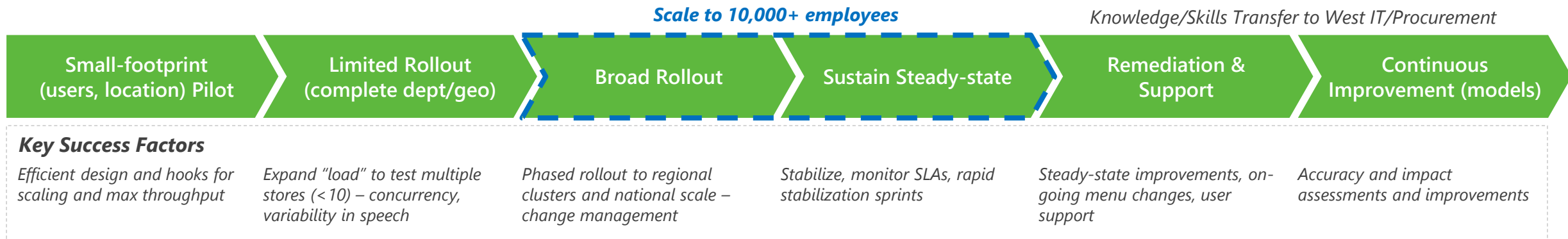
Microsoft Cognitive Services enables bot functionality to be extended

Cognitive Services

 Vision	 Speech	 Language	 Knowledge	 Search
Computer Vision	Customer Recognition	Bing Spell Check	Academic Knowledge	Bing Web Search
Emotion	Speaker Recognition	Linguistic Analysis	Entity Linking	Bing Image Search
Face	Speech	Language Understanding	Knowledge Exploration	Bing Video Search
Video		Text Analytics	Recommendations	Bing News Search
		Web Language Model		Bing Autosuggest
		Translator		

Scaled Implementation

 <p>Users</p>	<ul style="list-style-type: none"> • Active Directory Integration • Infinite scale through Azure cloud fabric
 <p>Bot Portfolio</p>	<ul style="list-style-type: none"> • Bot Hierarchies • Departmental Bots • Bot Frameworks for easy instantiation and shared learning
 <p>Localization</p>	<ul style="list-style-type: none"> • Local Style/Intent/Culture • Sentiment/EQ tracking • Emoticons and symbols
 <p>Language</p>	<ul style="list-style-type: none"> • Abstracted language framework for easy extensibility (meta-data driven content organization and text/labels) • Language packs to unlock bot methodology and training in other languages
 <p>Human-in-loop</p>	<ul style="list-style-type: none"> • Proactive and reactive failover to humans • Enhancement through the human pre-processing and checks • Brand and Customer SAT assurance
 <p>Integration</p>	<ul style="list-style-type: none"> • Bi-directional info flow with the enterprise systems of record (apps) • Business-aware and business ROI focus



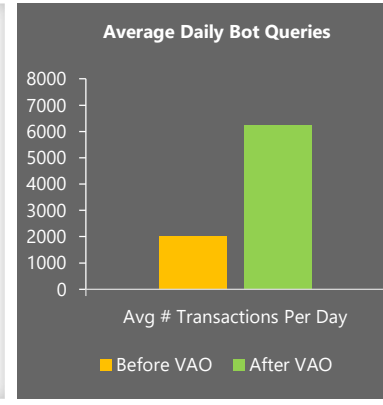
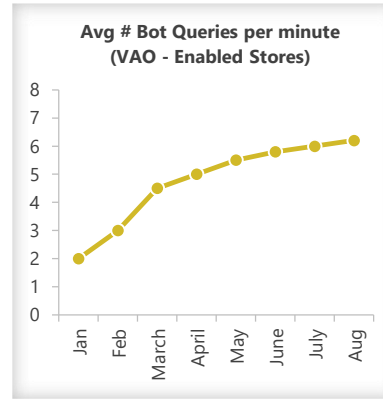
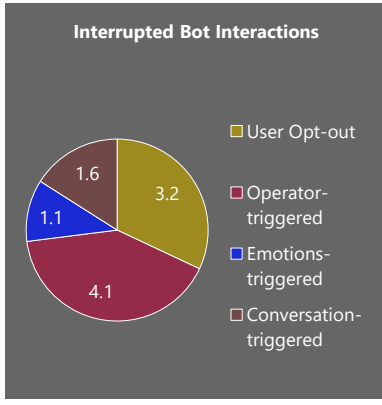
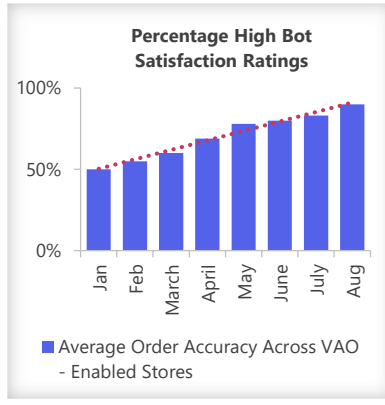
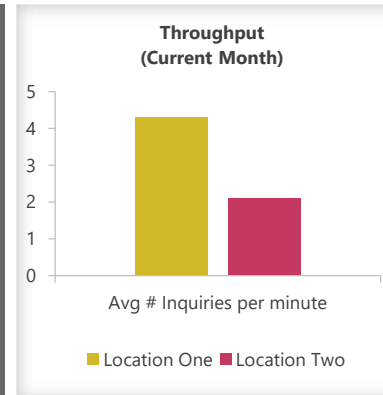
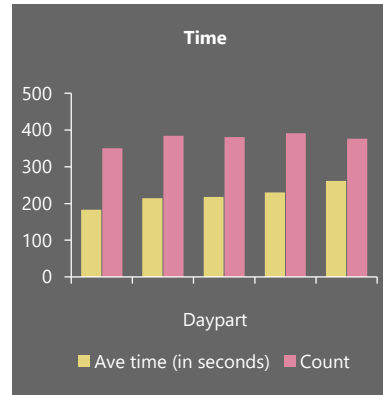
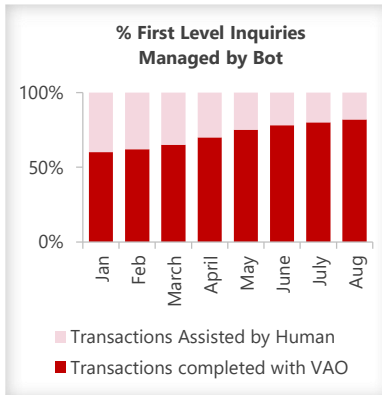
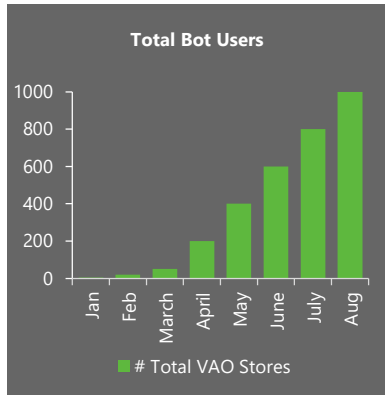
Real-time view into performance of Bot

ILLUSTRATIVE

Bot Management and Performance Interface



Procurement Process Performance



Considerations

- The number of interactions fed to bot system
- As the POC progresses, LUIS will continue to show improvement in learning and interpretation
- Sentiment data can provide additional opportunities to consider
- Automatic logging of activities will enable greater visibility into procurement processes, allowing for development of more efficient processes

Bot Features Overview

A Chat/IM Interface



- Variety in the chat interfaces (standalone web client, Skype)
- Carousel-based UI to display options
- Understand intent and conversation context
- Natural, human-like interactivity

C Self-improving/Learning



- Flexible LUIS framework to support improved natural language understanding over time
- Easily programmable business logic design to allow for modifications and improvements

E Admin



- Activity Logging: Capture all activity user, client IP, alias, Company, etc.
- Manage access, locations, integrations
- Manage ML refreshes and custom module deployments

B Integration and Workflow



- Integration to the Document Management Systems
- Integration to Ticket Management Systems
- Integration to ERP/CRM systems

D Security & Data Integrity



- Secure capture of text and voice transmission to the Azure Cloud (secure end-points)
- Integration to Azure Active Directory and User Access Rights

F Visualization



- Visualize the most frequently asked topics
- Visualize graphs of how users traverse topics
- Visualize feedback and usefulness scores
- Infra: Azure Consumption and Mgmt. Dashboard



G Historical and Trending



- Trends in Chat Bot performance
- Trends in Utilization, Frequency, Unique Users
- Trends in User/Customer Sat metrics

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45 mins

Q&A

10 mins

Demo

- 1) West QnA Maker Bot
 - a) <http://westchatbot.azurewebsites.net/>
 - b) [QnA Source](#)
- 2) West Basic Bot
 - a) <http://westdemo2017.azurewebsites.net/>
 - b) [Basic Bot Source](#)
- 3) West Decision Tree Bot
 - a) <http://westbotprocurement.azurewebsites.net/>
 - b) [Decision Tree Bot Resources](#)

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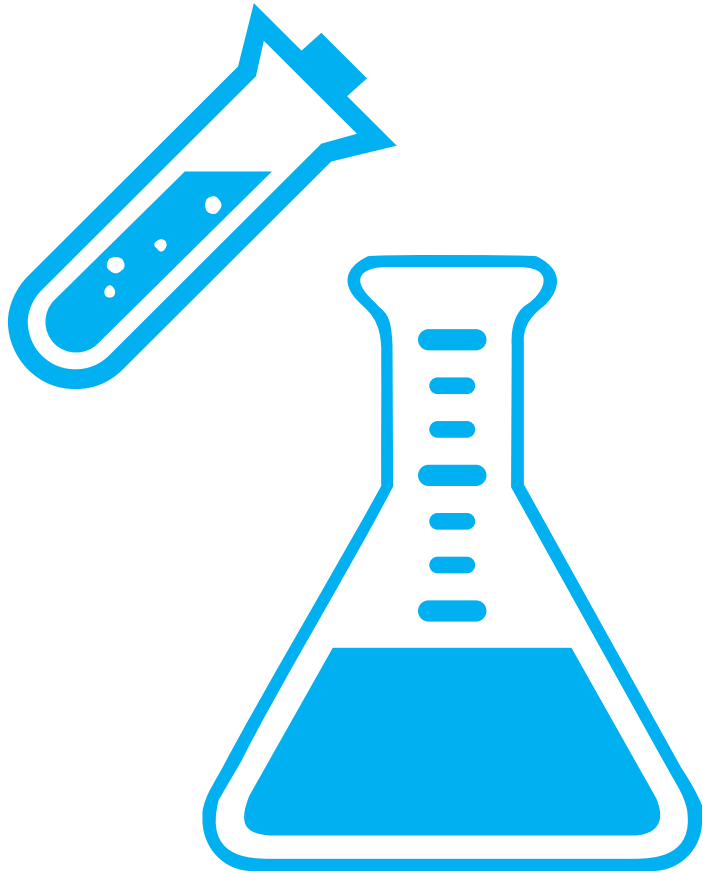
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Why is Neal Analytics Different?



Management Consulting Pedigree



Specialist Microsoft Cloud (Azure) Expertise
for Advanced Analytics, Data, and Cognitive Services



Deep and meaningful MSFT technical/Product Group
access

Appendix