



SAS[®] GLOBAL FORUM 2018

USERS PROGRAM

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#SASGF

Uncovering Big Opportunities in Big Data

Presenter

Dmitriy Khots, VP Center for Data Science, West Corporation

Dmitriy Khots is an advanced analytics executive with 15+ years of experience across a broad spectrum of industries including communications, finance, healthcare, entertainment, government, oil and gas, and power generation. Dmitriy currently serves as the Vice President of West Corp Center for Data Science, where he oversees corporate data strategy, governance, engineering, management, BI services, and advanced analytics. He holds a Ph.D. in mathematics from University of Iowa, is a prolific writer with three patents and 40+ publications in theoretic and applied fields of math, data mining, and stats. Dr. Khots is a member of AMS and INFORMS. Dmitriy has also been a SAS user for 10+ years.

Uncovering Big Opportunities in Big Data

West Corp Approach to Customer Experience Optimization

Agenda

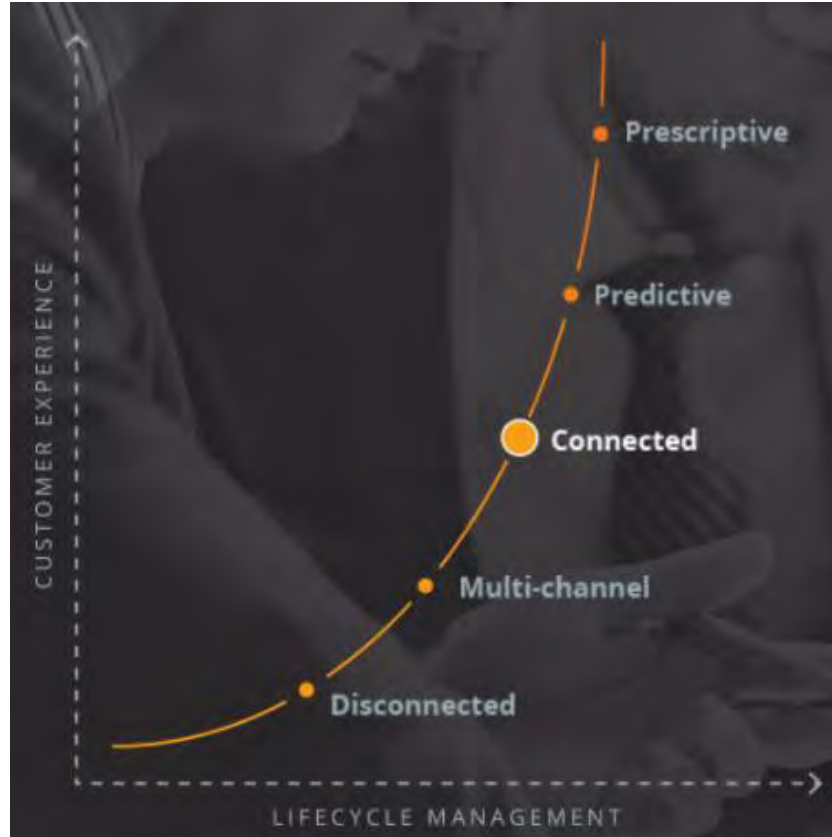
- West Corporation Overview
- Customer Experience Lifecycle Management
- Data Ecosystem
- Interactive Voice Response (IVR) Systems
 - Use Case I: Improving Customer Experience for performing routine self-service tasks
 - Use Case II: Introducing automation with SMS channel, measuring effectiveness
 - Use Case III: Optimizing Self Service for Financial Co
- Visual Voice: Multi-Channel / Context-Aware Applications
- Improving outreach success rates in patient care
- Chatbot experience for Utilities
- Call Impact Monitoring for Safety Services
- Big Data Management Practices and Challenges
- Conclusion and next steps

West Corporation Overview

We Connect People All Over the World



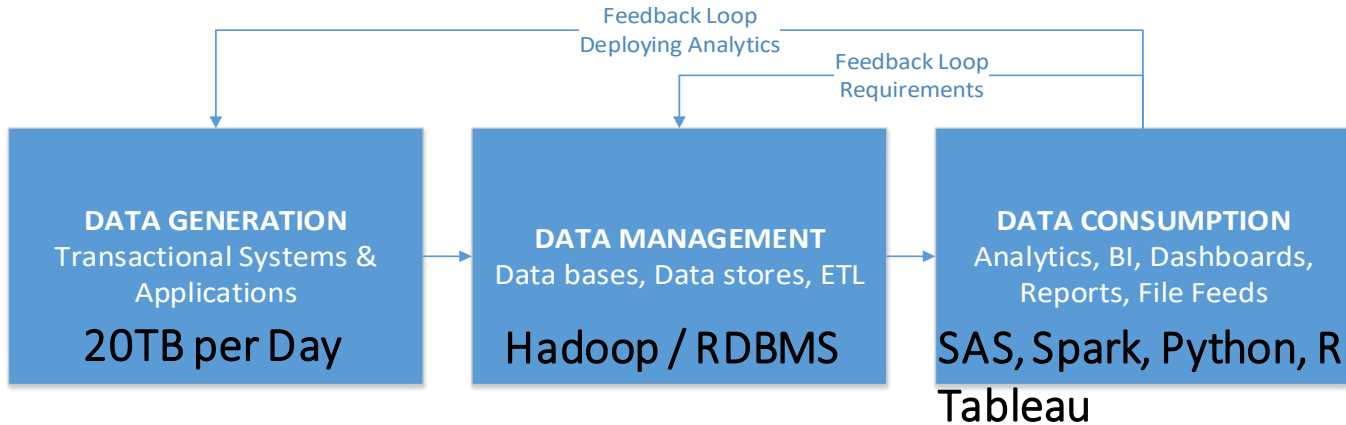
Customer Experience Lifecycle Management



<https://www.west.com/cxlm/>

Data Ecosystem

GOVERNANCE (Process, People, Tools)



Key Data Elements

- Who transacted?
- When?
- Why?
- What happened?
- Channel?
- Direction?

Key Elements

- Master data management
- Security
- Data dictionaries
- Data quality
- Retention Policy
- Tools (SQL, noSQL, etc)

Key Elements

- User base
- Access
- Evangelism!
- Tools (visualization, self-service, analytics)

Interactive Voice Response (IVR) Systems

Data

Who interacted or called?

When they interacted?

Why they interacted?

What happened during the interaction?

Objectives

Minimize customer effort

Maximize self service

Offer choice & convenience

Reduce unnecessary contacts

Analytics Solutions

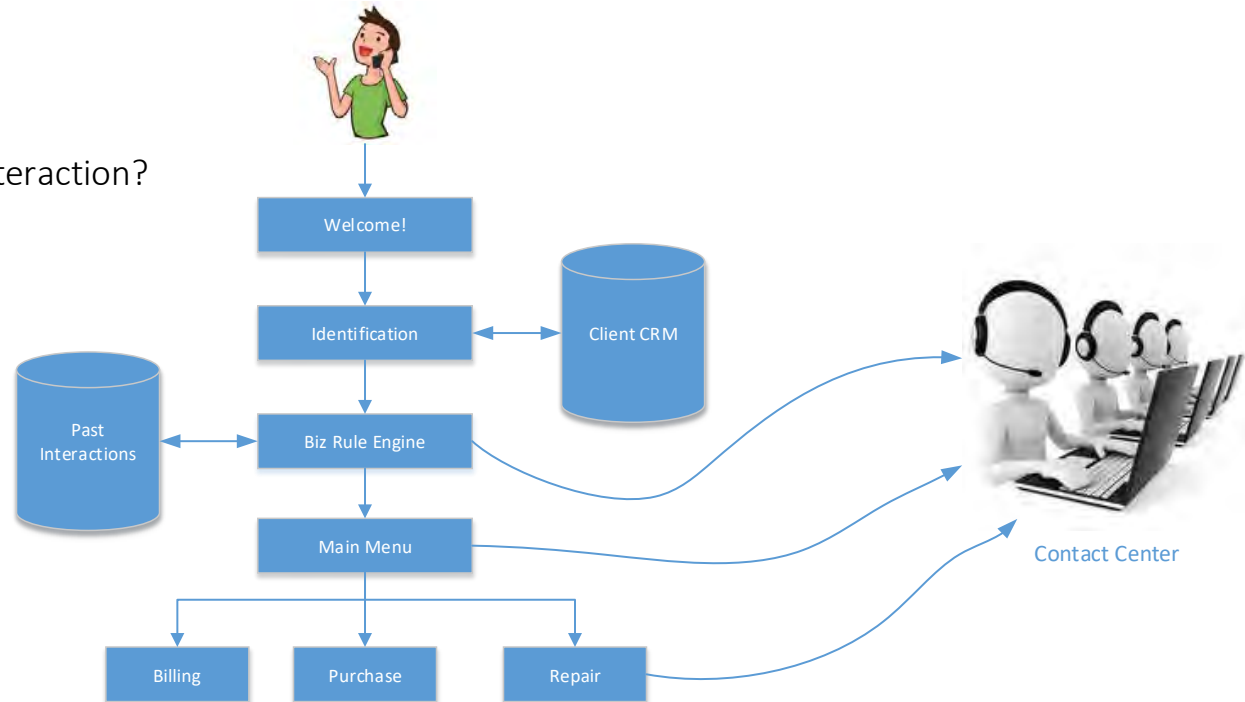
Customer journey viz

IVR parameter tuning

UX champion / challengers

Predictive Intent

Multi Channel Experience



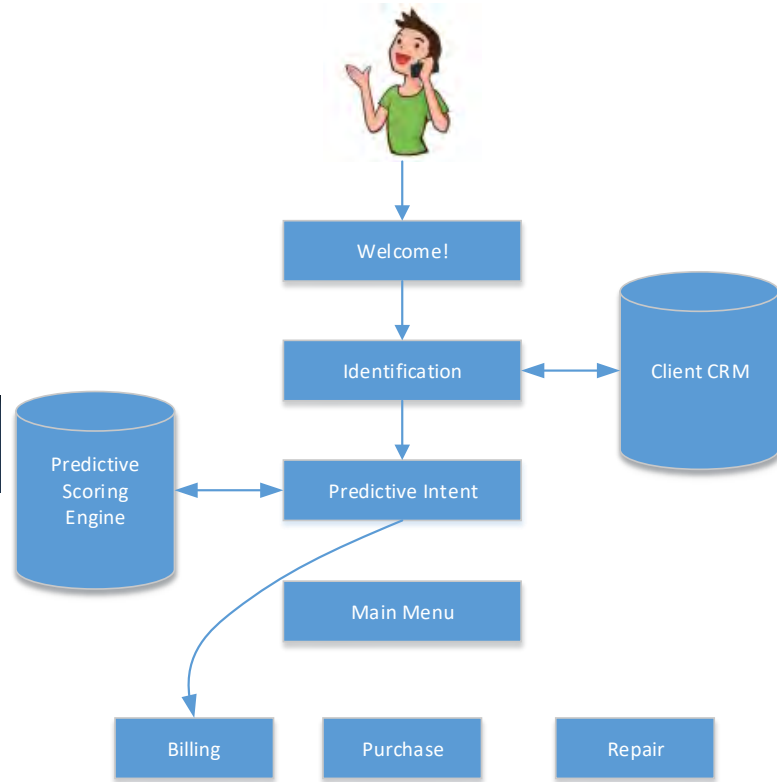
Predictive Intent

Knowing why someone calls
Reduce customer effort
Improve self service
Accuracy is key!



SAS® Event Stream Processing

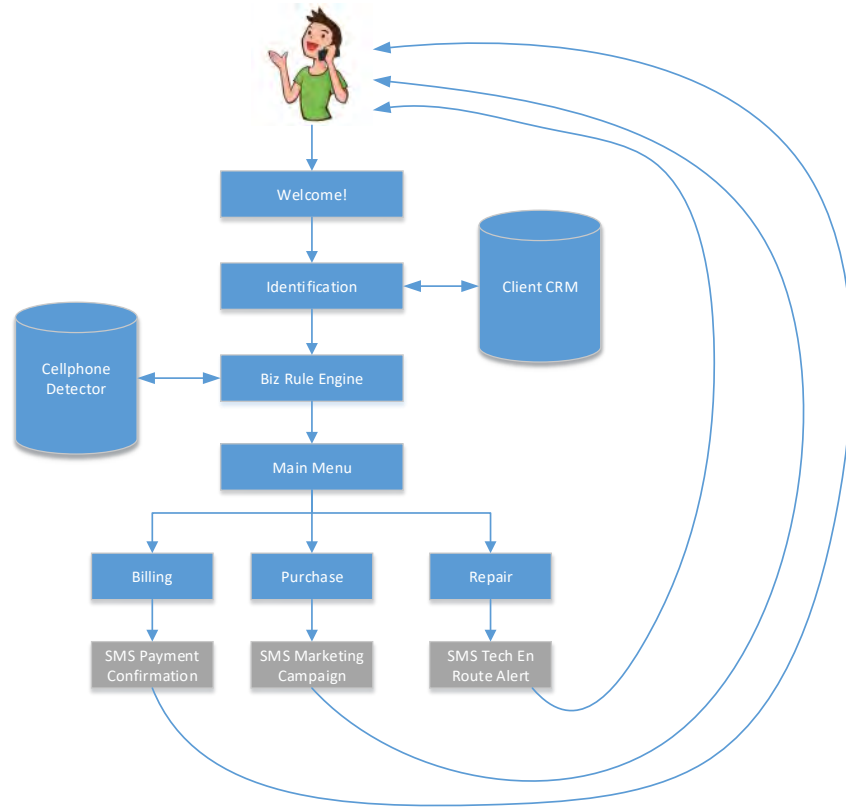
SAS® Viya®



Multi Channel Strategy

Using IVR as Pivot into SMS

Reduces repeat calls
 Reduces agent transfers
 Grows mobile adoption
 Increases sales
 Offers choice and convenience



Optimizing Self Service



A/B TESTING – design of experiment approach through iterative champion / challengers

AUTOMATION – automation of money transfer process via phone vs all-manual agent handling

Tools: SAS, Hadoop, Tableau

Visual Voice

Multi Channel Experience

- Blended IVR, SMS, and Mobile Web
- <https://www.youtube.com/watch?v=LFTYJ6rLNMs&feature=youtu.be>
- Multi-channel data tied in the back-end to deliver optimized customer experience through data analytics
- Using SAS/OR to create optimal journey suggestions to maximize self-service

Maximizing Patient Outreach Success

Just because a doctor writes a prescription doesn't mean the patient will pick it up. That can be dangerous to someone's health, so a top U.S. pharmacy partnered with West to find ways to improve patient adherence to doctors' orders. A full year of champion-challenger testing resulted in an additional 8.8 million prescription refills, helping patients keep their treatment plan on track.

Testing allows businesses to discover if a promising "challenger" can defeat the current messaging "champion." It uncovers benefits, saves money and avoids risk by focusing on the entire messaging strategy — not just keeping lights on. West and the pharmacy performed about 50 champion-challenger tests over a full year, which increased revenue by **\$132 million**. Here are a few notable results:

INTERACTIVE SERVICES CASE STUDY



Experience Connected at west.com/interactive | 800.841.9000

<https://www.west.com/wp-content/uploads/2018/01/Optimizing-the-Message-to-Help-Patients-Stay-Healthy.pdf>

TIMING THE MESSAGE – time of week / day of week optimization led to 3 million prescription pickups

FINE-TUNING THE FREQUENCY – duration between incremental attempts key parameter, optimal setting results in 520K incremental pickups

ACROSS CHANNELS – optimal blend of voice and SMS outreach

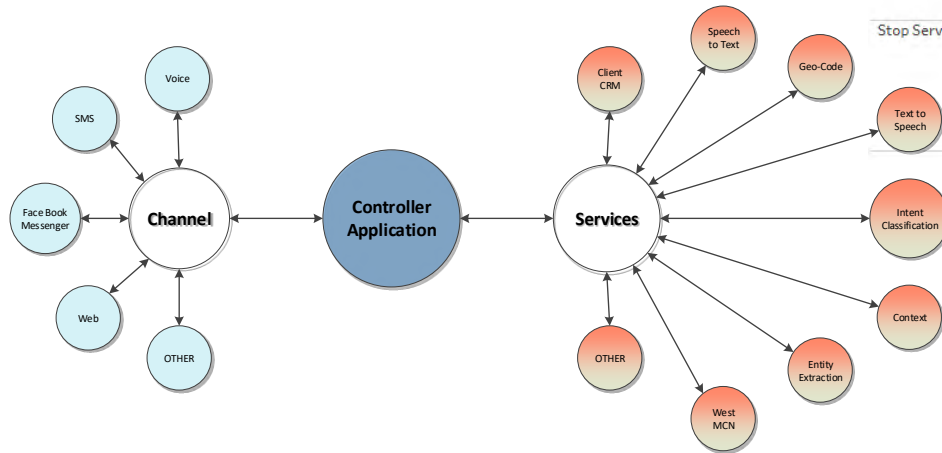
Tools: SAS/OR, Hadoop, Tableau

Chatbot Experience

- AI powered customer service assistant for Utilities
- https://www.youtube.com/watch?v=O_Ofv6jU1x0&feature=youtu.be
- Third party AI coupled with customer data and past behavior data tied to deliver optimal customer experience in a self service application delivered thru Voice, SMS, and FB

Intent KPI's Channel Comparison

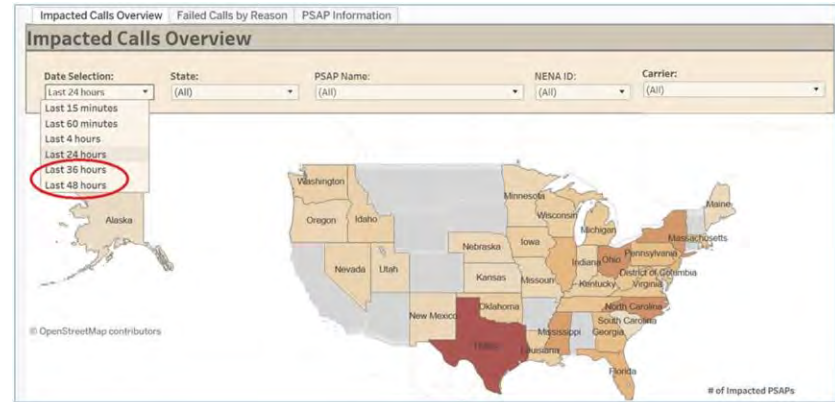
Intent Name		FB Messenger	SMS	Voice
Add Service	Intent Start Count	1,071	3,404	2,884
	Intent Completion Count	626	1,906	1,421
	Intent Completion Rate	58%	56%	49%
	Total Turns To Complete Intent	1,576	5,011	4,248
	Avg Turns to Complete Intent	2.5	2.6	3.0
	Total Time To Complete Intent (mins)	1,801	6,328	5,113
	Avg Time to Complete Intent (mins)	2.9	3.3	3.6
	Correct Intent Classification Count	1,034	3,237	2,731
Change Service	Intent Classification Accuracy	97%	95%	95%
	Intent Start Count	5,898	21,679	15,090
	Intent Completion Count	3,175	11,186	7,706
	Intent Completion Rate	54%	52%	51%
	Total Turns To Complete Intent	8,374	31,957	22,347
	Avg Turns to Complete Intent	2.6	2.9	2.9
	Total Time To Complete Intent (mins)	10,220	38,808	26,568
	Avg Time to Complete Intent (mins)	3.2	3.5	3.4
Stop Service	Correct Intent Classification Count	5,644	20,481	14,356
	Intent Classification Accuracy	96%	94%	95%
	Intent Start Count	14,429	55,184	43,388
	Intent Completion Count	7,713	28,731	22,384
	Intent Completion Rate	53%	52%	52%
	Total Turns To Complete Intent	20,712	81,960	64,491
	Avg Turns to Complete Intent	2.7	2.9	2.9
	Total Time To Complete Intent (mins)	24,977	97,608	76,546
Avg Time to Complete Intent (mins)	3.2	3.4	3.4	
Correct Intent Classification Count	13,819	52,394	41,288	
Intent Classification Accuracy	96%	95%	95%	



- Data Tools: Hadoop (JSON storage in HDFS, Impala), SAS, Python, Tableau
- Potential tools: SAS Streaming Event Processing

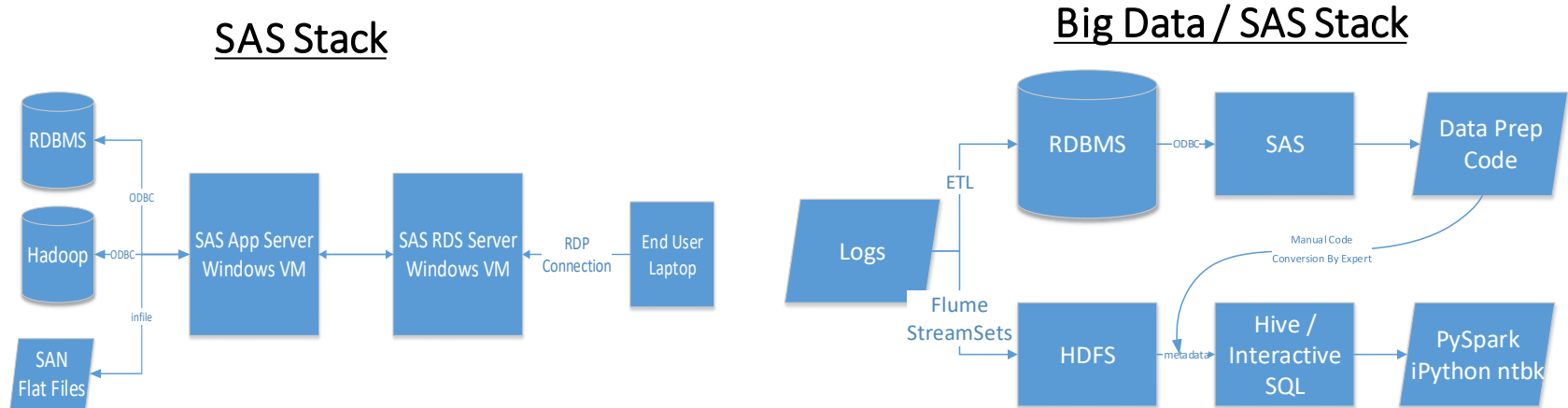
Call Impact Monitoring for Safety Services

- Need to identify 911 services outages in near real time.
- Ingesting platform call detail records thru Flume and StreamSets into SOLR / Impala – providing near real time view and search thru Tableau and Hue



- Need to identify call correlation across floating window in real time
- Potential use case for SAS Event Stream Processing

Big Data Management



For more detail, read West's Hadoop Journey along SAS paved Road
<http://support.sas.com/resources/papers/proceedings17/0823-2017.pdf>

Conclusion and Next Steps

- Big Data can generate big results only when implemented and properly supported (leadership, tech, people)
- Start your journey with business use cases rather than technology
- Don't have to start big (\$) to work with Big Data. Pilot – Prove ROI – Production.
- Generate ROI through low hanging fruit
- Continue to explore integration opportunities for SAS and Big Data stack for off-line and on-line model development and scoring (SAS Viya, SAS Streaming Event Processing)
- Next big step for Big Data at West - Cyber Security.

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