

Teradata Business Analytics Solutions





Business Outcome Led, Technology Enabled





Data is worthless until you analyze it







Analyzing data is a science experiment until applied to a business process/outcome





Case Study – ATM Manufacturing and Services Company Customer Scenario (IT Sales Motion)

- Customer predicts part failure for their ATM's in order to proactively replace parts when servicing a down ATM
 - Replace parts that will fail earlier than the next typical service call
- A team of 3 people built predictive models using Excel and other tools
 - Model development highly dependent on 10+ years of ATM failure knowledge
- Customer wanted to see if Teradata can predict as well as their existing models without knowing an ATM.
 - Customer wants to service other machines and they won't have "machine knowledge" to build the predictive part failure models like they do today
- The success criteria is that Teradata's predictions need to have better results and be 100% accurate!

This case study is from multiple customer experiences and not a real world customer, figures or business results.



New "Data Science" Techniques



"We Accept the Challenge"

SQL

Ease of data manipulation using the language of business tools

Statistics

Leverage statistical modeling techniques that have been proven over time

Machine Learning

Techniques to sift through data with minimal human input to gain new insights previously undetected



Not just a visual graph of who knows who, but analytical graphs of the strength of relationships based on attributes

Uncover sentiment, word clouds, compliance infractions in communications and documents of all kinds

Path/Pattern and Time Series

Insight on interaction patterns is critical whether it is the behavior of people, products or things

Let's Review the Technology Challenge



Let's Review the Results

Current predictive part failure results using "historical ATM knowledge" and modeling techniques

Total part failure incidents in multiweek dataset

What's This?

Technical Success Criteria

- Higher prediction with 100% accuracy
- Prediction based on data only, no "historical ATM failure knowledge"

Aster Multi-Genre analytic approaches and machine learning predicted many more part failure incidents

Success

We Doubled the Predicted Failed Parts



Let's Review the Results

Current predictive part failure results using "historical ATM knowledge" and modeling techniques Total part failure incidents in multiweek dataset

Failure

False Positives – These parts didn't fail

 Note: Didn't fail within the test dataset timeframe but could have failed shortly thereafter

Technical Success Criteria

- Higher prediction with 100% accuracy
- Prediction based on data only, no "historical ATM failure knowledge"

Aster Multi-Genre analytic approaches and machine learning predicted many more part failure incidents



We Doubled the Predicted Failed Parts



Let's Review the Results

Current predictive part failure results using "historical ATM knowledge" and modeling techniques

Total part failure incidents in multiweek dataset

Failure

How About This? Triple the Number!!

Technical Success Criteria

- Higher prediction with 100% accuracy
- Prediction based on data only, no "historical ATM failure knowledge"

Aster Multi-Genre analytic approaches and machine learning predicted many more part failure incidents

Technology Led <u>Not Focused on Business</u> <u>Outcome</u>

IFRADATA









Start with business process mapping





Business Process Mapping "Day in the Life Today" and then "Day in the Life Tomorrow"

- Clearly identify business process improvement, decisioning points and bottom line business value!
- Business process mapping is a mapping of your business processes and decisioning points, it is not an IT architecture chart
 - IT architecture is important but needs to support the business process
- Clearly articulate business value improvement



ATM Service Calls – Without Predictive Part Failure





ATM Service Calls – With Predictive Part Failure

ATM Service Calls – With Even Better Predictive Part Failure

ATA ATA ATA ATA	ATM ATM ATM A	\$150 Savings of Service Call ATM #1 Savings of Service Call ATM #2 Savings of Service Call Savings of Service Call
	• • • • • •	Services Revenue \$ 1,000,000,000 Gross Margin \$ 250,000,000 25% Services Cost \$ 750,000,000 25% Labor Cost \$ 375,000,000 50% # of Services Calls 2,500,000 150
010010		Softw are Calls 625,000 25% Paper Jam Calls 500,000 20% Part Failure Calls 1,375,000 55% 2,500,000 100%
π Σ Predicted Replace Part Part in Failure ATM #2,#3		Part Failure Calls1,375,000# of Calls Eliminated137,500Savings Per Call\$ 150Total Savings\$ 20,625,000
	•••••	Part Failure Calls1,375,000# of Calls Eliminated275,000Savings Per Call\$ 150Total Savings\$ 41,250,000
Month 1 16 © 2017 Teradata	Month 2	Month 3 TERADATA



ATM Service Calls – Shipping Costs



ATM Service Calls – Shipping Costs w/Predictive Part Failure



2017 Teradata

Branch 101 Branch 101 Branch 101 \$50 \$50 \$50 Down ATM Down ATM Down ATM Penalty Penalty Penalty ATM #3 ATM #3 ATM #2 #3 #1 #2 #4 #1 #4 #1 #2 #4 . ᠋᠊᠋ᡵ Π_{1} Service Handheld Pick Up Repair Call Dispatch Parts ATM #1 Month 1 Month 2 Month 3 20 © 2017 Teradata

ATM Service Calls – Penalties



ATM Service Calls – Penalties w/Predictive Part Failure



22 © 2017 Teradata

What's the Potential Business Opportunity?

Prediction Improvement	Service Calls	Shipping	Penalties	Total Opportunity
10%	\$20.625M	\$ 6.875M	\$ 6.875M	\$34.375M
20%	\$41.250M	\$13.750M	\$13.750M	\$68.750M

Can I have a few false positives? Is it OK to replace a \$25 part that wouldn't have failed?



Let's Review the Business Outcome Led Opportunity



Business Background

- Service call averages \$150
- Average part is \$25
- If a part that may fail in the near future is replaced it has the potential of saving a service call of \$150
 - Which "Circle" Would You Choose?

Let's Review the Business Outcome Led Opportunity



Business Background

- Service call averages
 \$150
- Average part is \$25
- If a part that may fail in the near future is replaced it has the potential of saving a service call

This "Circle" is Even Better

What Did the Customer Say?

Replacing these parts while on an existing service call saves \$150 by eliminating a future service call.

Replacing these parts while on an existing service call saves \$150 by eliminating a future service call

Replacing these parts is a \$25 cost as they wouldn't have failed in the expected timeframe Business: "Who said we had to be 100% accurate?"

IT: "You did. You wouldn't trust our black box unless we were 100% accurate."

Technical Success Criteria

- Higher prediction with 100% accuracy
- Prediction based on data only, no "historical ATM failure knowledge"



Business Outcome Led, Technology Enabled

- Identify big business problem(s) to solve
- Identify a business sponsor
- Understand how you address the problem(s) today
- Identify "better decision" needed to drive business results
- Map business processes before and after "better decision"
 - Understand how to operationalize business process
- Identify business value
- Now discuss how technology (analytics and data) enable above



Rapid Analytic Consulting Engagement (RACE)

- Delivers leading edge analytic models and insights for a big data use case
- Proven method that fuses data science, business knowledge & creativity to maximize ROI



Business Outcome Led

Technology Enabled



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- Understanding functional business
- processes is critical. Often leveraged across industries



3X HIGHER

 spend and more transactions from
 Ace Rewards customers Nordea

Fin **5 DAY** Iron reduction in tion close cycle times NETFLIX

Pro 75% of all viewings via personalized recommendations

HIGHMARK. 🖁

Risk\$34M Viti (in fraudulent activity identified

SIEMENS

Ass 9.9% Option-time arrival (rate for trains **Cardinal**Health[™]

Oper50% a Excetime savings for Users working with raw data



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In fact, **industry leaders in every field** partner with us.



7_{of top} 10 RETAIL & HEALTHCARE 8 of top 10 MANUFACTURING 9_{of top} 10 TELECOM & BANKS







Analytics Business Consulting focused on helping discover high impact areas that map to leverage points against business processes.

usiness Solutions

Data Science to help you discover insights that deliver positive business outcomes through skilled data scientists and analytic professionals

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Analytic Solutions focused on delivering high impact business outcomes that accelerate time to value through proven intellectual property, technologies and consulting methods.



While we are known as the leader in analytic technology...

It's our people, combined with our expertise helping global organizations innovate through analytics, who are the secret to YOUR future success.



5,000+ Consultants 500+ in Analytics Business Consulting and Data Science



People like...





Skills:

Depth in management consulting advisory with expertise helping enterprise organizations improve productivity, enhance transparency and increase overall corporate performance.

Austin Avers Sr. Business Consultant

Capabilities:

Financial performance and customer experience with an emphasis on reducing churn and increasing customer engagement.

Strengths in business process automation and customer journey analytics.

Experience:

15 years of business analytics consulting experience in retail, media and entertainment, including work with 3 of the top 5 companies in retail. 18%

worked in systems integrator (SI) consulting





Skills:

Proficiency uncovering new or enhanced business models by leveraging predictive modeling and facilitating statistical and data analysis techniques.

Advanced skills in data mining and developing algorithms.

Samuel Thunderhall Data Scientist, Sr. Consultant

Capabilities:

Gathering and generating insights from structured, unstructured and semi-structured data sources.

Expertise in helping business users identify patterns and relationships in both large and unique datasets.

Experience:

13+ years of experience applying mathematical techniques using data exploration to enable data-driven insights for business stakeholders in retail and telecommunication sectors.



worked as an analytics practitioner or manager


•	We already trust Teradata to excel as a technology provider for analytics, but as soon as we engaged with them for analytic business consulting and data science services, it became clear that we would quickly benefit from their breadth of experience.	
	David Bloch Head of Analytics and Data Strategy,	
	Vodafone New Zealand	



We have encapsulated the **combined experience** and **expertise** of our consultants, resulting in **innovative** and **proven IP**, which we call our...

BUSINESS VALUE FRAMEWORK



Teradata Business Value Framework™



Business Focused

Our BVF™ framework is derived from proven field-based experience and working with industry leading companies





Developed by business and technology consulting teams, hardened with experience



Flexible

Adaptable to client needs, governed in best-practices enagement methodology



Evolving

Continued encapsulation of IP results in flexible enagement options, combined with proven anlaytic capabilites



BUSINESS VALUE FRAMEWORK Customer experience example





Data and analytics capabilities delivering best-in-class Marketing and Customer Experience







Data and analytics capabilities delivering best-in-class Marketing and Customer Experience







Develop a deep understanding of the customer to drive informed decisions and communications

	Analytical Capabilities			
	Customer Value & Profitability	Customer Journey Analysis	Customer Segmentation	
Insight Driven Customer Management	Customer Satisfaction Indexing	Event Analytics	Customer Connection Analytics	
	Customer Experience Analytics	Behavioural / Preference Analytics	Customer Life Stage	
More info >	Transaction Clasification			





Insight Driven Customer Management

Analytical Capability Areas

Customer Value & Profitability targeting new prospects, and manage existing customers based on their current & future value potential

Customer Satisfaction Indexing measuring and managing the impact of interactions on customer satisfaction and experience

Customer Experience Analytics measuring and predicting the customer's perception of a service or product

Transactional Classification classifying account transactions (e.g., salary payments, channel usage, purchase history, etc.) to better understand customer behaviour, life stage, channel usage and preferences

Customer Journey Analysis identifying of sequences of events and patterns which lead to or follow on from key customer events

Event Analytics identifying customer events to drive highly relevant interactions





Insight Driven Customer Management

Analytical Capability Areas

Customer Segmentation defining and subdividing the customer base into a number of clearly identifiable segments that have similar needs, behaviours, or communication characteristics

Customer Connection Analytics understanding the network a customer is in to capture the most influential person, forces and patterns of a social network

Behavioral/Preference Analytics translating observable customer interactions into actionable insights around their overall behaviour and product/service preferences

Customer Life Stage utilizing customer transactions, interactions and self-reported information to develop a full understanding of where they are in their relevant life stages (e.g., starting out, married with small children, empty nesters, retired, etc.)





Customer Satisfaction Indexing

Level		Maturity Statement			Desire
Leading		Incorporate sentiment analysis, multi genre analytics in combination with business rules to calculate customer satisfaction. Scores are operationalized and drive actions to improve processes and customer experience. Active monitoring and alerting on increases and decreases of scores. CSI becomes integrated with Customer Profitability/Value Management			
Innovating		Build robust cross channel interactions, and touch points. Analyze customer s across touch points to identify interactions that drive positive or negative outcomes.			~
Practicing		Experiment with text analytic capabilities (may be outsourced) to understand customer comments on products, service and experience. Limited ability to react to negative comments. Call center is key to identifying customer issues. Advanced analytics deployed to identify limited set of key interactions			
Developing		Begin to collect and integrate customer interactions across two or more channels. Customer satisfaction measurement is still primarily survey based			
Emerging Priority		Customer satisfaction measurement is primarily survey based. Unable to connect customer events and interactions across channels. Customer experience is analysed and managed by channel (stores, online, call center, etc.)			
		Key areas for improvement	Benefits from uplift	Time	rame
High	\checkmark	Client's view of key areas for improvement e.g.	Start with sample outcomes on previous slide Consider how improving maturity lovel will impact these		
Medium		 Analytical capability (sophistication, resourcing) Analytical agility, time to market, automation Data completeness, latency, extent of integration Consider how improving maturity level will impact these Balance these against client strategic priorities 		H1 2018	
				1	



Use case examples delivering Insight Driven Customer Management business value





Path to Profitable/Unprofitable Customers

Use Case Summary

Objective / Problem Statement

• Being able to understand which new customers are likely to bring low/high value to the bank means the bank can proactively make standard service plans for all new customers and re-pricing/growth plans for low value new customers

Business Benefit

- · Accelerated path to profitability
- Encourage customers to adopt profitable behaviour

Source Data

- Motivation data that shows the reason why the customers come into the bank
- Transactional data that identifies normal v abnormal behaviour suggesting customers towards bad or good
- Other data including customer basic data, channel data, product hold data, customer value data

Challenges

 Many paths to profitability and some may not be able to be directly influenced

Methodology / Analytic Technique

 N Path to identify most journeys that lead to bad/good customers (including most common journeys)

Success Criteria

- Identification of events that can be incorporated into an on boarding programme to accelerate the path to profitability
- Identification of events that can be used as intervention points to prevent unprofitable behaviour
- Understand profit drivers to enable optimisation of product and service propositions

Expected Outcome

References

IC Andrew Johnston

- Understand and modify bad (unprofitable)
 customer's behaviour
- Identify good customers' process when, where, who and how to market customers
- Establish new customers standard service plan, outcomes are lower more revenue from future sales and recover customer acquisition costs



Customer Network Experience Handset and Device Performance

Use Case Summarv

Objective / Problem Statement

- Profile traffic and signalling of handsets, terminals and devices including tablets, dongles and M2M devices.
- Identify and correct instances of, misconfigured handsets and mismatched SW/FW variant to CSP's network's configuration
- Provide insights to Sales & Marketing & Customer Ops etc re: "in use" vs. "sold/contract" handset mismatch etc

Insight Driven Customer Management

References

Multiple Tier 1 Telcos - Global

ICs: Jon Penrose, Laurent Laisney

Business Benefit

- Gain insight into Insight into device usage profiles and impact on network auglity, performance & capacity
- Identify and correct device related customer experience issues
- Identify upsell & cross-sell opportunities

Source Data

- Customer Data
- MSIDSN
- Demographics, Customer Value
- Tariff & Tenure information
- Usage history & billing information
- Device data

Challenges

- Cost of sourcing up-to-data TAC code information
- Availability of sufficiently detailed, customer level data
- High volumes of multi structured network data

Methodology / Analytic Technique

- At device type/model level
- On error code groups
- Device/Customer enrichment
- Correlate Customer Value with device type/model performance (aggregated on service and error code level)

Success Criteria

- Identify customer behaviour patterns service/application usage etc.
- Benchmark performance by device type, SW variant, OS etc.
- Visibility of impact of handset performance on user's QoS

Expected Outcome

- Device Performance & Quality Management.
- Per device type/model
- Correlation between model, SW version/OS, error code groups, type of service (voice/SMS/data/M2M)
- Development of error code patterns etc over time
- Device Management. & Customer Value
- Total service usage (duration, event(s), data volume, ...)
- Total service revenue



49

- IMEL IVSI · IMEA, TAC codes (for device types)
 - QoS information & KPL data
 - DCR, CSSR, HOSP etc
 - Network data
 - Cell IDs & inventory data
 - Performance mamt data

Device Performance statistics

- Frror code statistics

Customer Network Experience Handset and Device Performance

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Example analytics: Handset Distribution and Dropped Call Rates



Insight Driven Customer Management

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- Device Management. & Customer Value
- Total service usage (duration, event(s), data volume, ...)
- Total service revenue

Example analytics: Handset "Re-boot" Analysis by Model

730SC 740SC 840SC 90550 92050 Aino U10 18.00 Aspen M1 62100 B2700 16.00 82701 82710 B3210 \$ 14.00 B3310 B3310 B3313 12.0 B3410 B3410R B3410V HS MODEL SGH E800r 85310 Vendor (group B5330 Samsung avo Reboot ont per Handset/Da B5510 8.00 B5510L J Keep Only X Exclude @ 85512 85702 6.00 85722 B/520 B7110C 4.00 87300 67320 B7330 2.00 873308 B7350 87510 0.00 B7510L B7610





Path to Appointment

Use Case Summary

Objective / Problem Statement

- Understanding the reason and effectiveness of steps why customer accepts an appointment with bank advisor
- Allow more efficient selection of customers based on events to stimulate customer to accept appointment
- Analyse patterns or sequences of events that are even more predictive of customer to meet with bank or vice verse reduces likelihood to accept

Business Benefit

• Improved conversion and show rates form better targeted activities

References

ICs CK Loy & Vince Leat

• Reduced over solicitation to certain segments of customers (E.g. regular visitors, located close to branch etc.)

Source Data

- Customer data
- Transaction data including history for all customers
- Interaction Data cross channel (Branch, ATM, Call Centre, Online etc) Customer Journey
- Clickstream data tbd
- Contact data (e.g. appointment behavior including no shows)

Challenges

- Data availability
- Data preparation

Methodology / Analytic Technique

- Sessionise data identify unique customer journeys
- N-Path to identify all interactions and transactions leading to a product purchase (or not)
- Analysis to understand which paths are more likely to lead to a sale
- Predictive Model for propensity to accept appointment

Success Criteria

 New insight generated feeds into creation of optimised contact strategy for proactive branch appointment activity – includes predictive models for selection and contact rules to control frequency of interactions

Expected Outcome

- Build sales leads to accept appointment that are triggered by the most powerful sequences
- Build scripts that reflect the sequence: 'We saw you did x then y and wondered if we could help...'
- Avoid useless invitations to customers fewer mailing, contact cost
- Improve response rates better sales and service performance



Lead Generation From Branch Notes

Use Case Summary

Objective / Problem Statement

- Bank gathers notes on discussions with customers conducted by branch personnell/ finance advisors
- These notes are currently not analyzed due to the lack off tools capable working with unstructured text
- Banked wanted to generate leads based on topics discussed with clients and based on competition products mentioned

Business Benefit

- Increased cross sales of products and services
- Improved relevance of customer contact driven by customer elicited information

References

IC Andrew Johnston

Source Data

- Customers demographics and product holdings data from banks EDW to identify current product holdings.
- CRM notes inputted into the system by finance
 advisors after meetings with customers
- Transaction data to identify outgoing payments to cover products with competitor banks

Challenges

- Quality of notes
- Data availability
- Data preparation

Methodology / Analytic Technique

• Text analytics in the Teradata Aster system to create structure to the text in CRM notes and to identify product interests, competition bank product holdings and important life stages. Cross verification of this information with information in transactions.

Success Criteria

• Develop new suite of events and triggers generated from analysing the free format text in branch notes

Expected Outcome

- Identification of leads for products such as car insurance, mortgage with competitor, maternity leave etc.
- Usage of these leads to drive cross sell and up sell
 marketing communications



Identify 'Hidden' Individual Business Owners

Use Case Summary

Objective / Problem Statement

- Many individual customers are also running small business. However, most of them are not known by the bank.
- They are potential customers that banks can cross sell or upsell more business related products
- Challenge is how to identify these individual customers without information stated to the bank on their profile?

Business Benefit

- Increased sales of business related products
- Higher cross sales rates for business products
- Ensure customer pays appropriate fees for business services

Source Data

- Transaction data (including transfer news) to identify whom, when, frequency and purpose of transactions
- Customer demography to identify known salaried customers/regular individual customer and others

Challenges

- Data availability
- Data preparation

Methodology / Analytic Technique

- Graphs to map transactions
- Text analysis to identify transaction purpose
- Statistical analysis & Predictive model to further predict which customers are not the same as known regular customers

Success Criteria

 Identify suitable triggers and behaviour to indicate a customer is running small businesses from personal accounts

Expected Outcome

- Expected Discovery:
- Identified business owners

References

IC Andrew Johnston

- Increased potential business value
- Increase product penetration by providing relevant products to business owners



USE CASE WORKSHOP

ANALYTIC MATURITY REVIEW

BUSINESS VALUE ASSESSMENT

Business Outcome Led, Technology Enabled



Rapid Analytic Consulting Engagement (RACE)

- Delivers leading edge analytic models and insights for a big data use case
- Proven method that fuses data science, business knowledge & creativity to maximize ROI



Business Outcome Led

Technology Enabled







• Customer Benefits

- Accelerated Time to Value Implementation Time
- Governed yet Adaptable Framework
 - **Reduced Risk**
 - Proven Field-Based Experience







Turning **insights** to **action**

Starts with a business challenge

Leverages a proven methodology Proves business value





Business Outcome Led, Technology Enabled





