Data Analytics…
… and the CIO

Mark Livingston
Senior Vice President, Cognizant Business Consulting

James Jeude
Practice Leader, Cognizant Business Consulting, DWBI/Analytics

Cognizant

Data Analytics

A New Imperative

> "*Advanced Analytics* is a top-ten priority for CIOs, rising in position every year this past decade."

➔ IT must transition from "Running The Shop" to "Driving Value"

➔ IT is uniquely positioned to deliver Enterprise-wide value

➔ CIOs are uniquely positioned to discover and promote Enterprise-wide projects

➔ Data Analytics have a high ROI

➔ Innovation = a way to differentiate from competitors

➔ **Bottom line: Extract More Value from Data!**

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

The Enterprise Perspective

Analytics Across Departments

"My projects are department and subject-driven, but my data is enterprise-level."

➔ The *Enterprise Perspective* means
Integrate … then Analyze … then Summarize
A classic *Departmental Approach* means
Analyze … then Summarize … then Integrate

➔ Example: Departmental Thinking gives a Dashboard that simply says
102% sales target, 97% on-time delivery to stores

➔ Basic existing investments already in place, therefore
value-added Analytics are low hurdle, high value

➔ The CIO's perspective and position in the organization makes
Advanced Analytics an imperative

What is **Decision Valuation?**

Optimizing choices along multiple dimensions

"What decision is being optimized? What are the choices and 'expected value' of each choice?"

Yes/No answers to single-hypothesis questions

TRADITIONAL Approach

Classic yes/no decision-making

"Decision Valuation"

Continuum of answers to continuously-variable conditions

Vary the Answer AND the Conditions simultaneously

"Decision Valuation" is about reconciling these two approaches

But first, a personal story …

A Moment of Epiphany

Early in my career …
I was asked …

"James, we have money for 50,000 mailings. Give me top 50,000 names."

WRONG QUESTION

I thought to myself …

Why 50,000 mailings? Why not 49,000 or 51,000?

What other promotional options do we have?

At what point does COST of promotion exceed expected value?

What is competitive response to the promotion likely to be?

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

Decision Valuation: "How To"

Common Steps

1 Ask the right questions

2 Parse the ROI Equation and Align with Corp Priorities

3 Optimize the answer using Analytics

4 Deploy the answer

5 Think about qualitative issues (moral hazard, competitor response, etc.)

© Cognizant 2010

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

Example #1: Customer Churn

Asking The Right Questions

"Give me a list of clients most likely to leave."

WRONG QUESTION

➔ What is expected value to KEEP the customer?

➔ What is PROBABILITY of leaving (do not use a simple Yes/No prediction)

➔ What is the accuracy of the model for true/false detection?

➔ What is COST OF REMEDIATION (stratified by customer type) ?
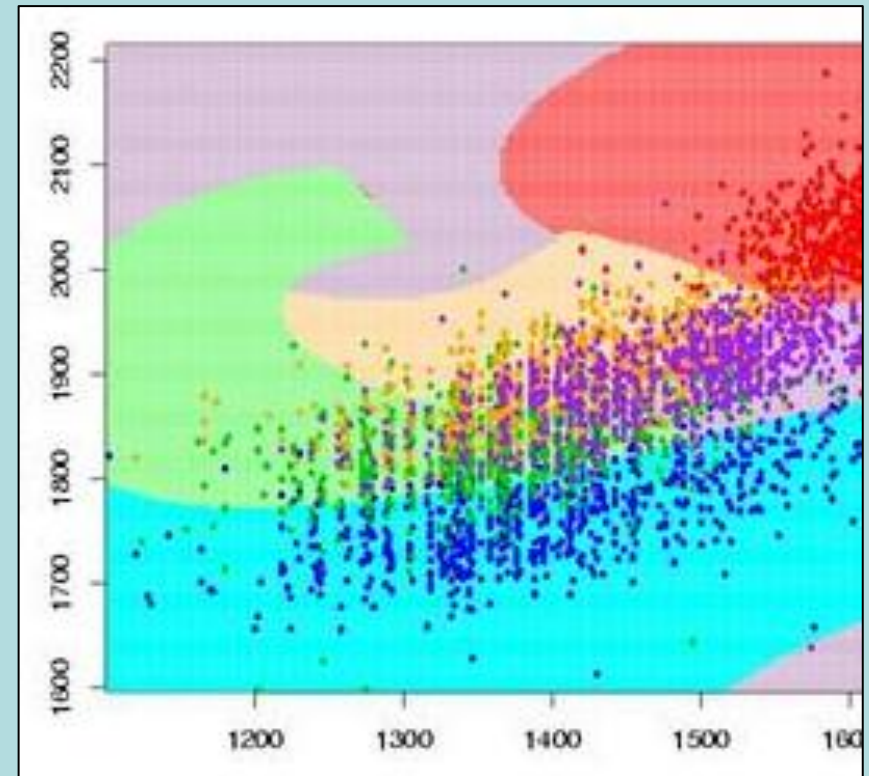
Example #1, continued

The Churn Prediction Grid

How are the lines drawn?
1. Line ❶'s position = FACT
2. Line ❷'s position = Statistical Best Guess

Predicted OK   ❷   **Predicted Churn**

Actual OK

Good
(happy customer, good revenue)
WANT MORE!

Bad
(Cost incentives to stay, when they wouldn't have left anyway)

❶

Actual Churn

Bad
(missed opportunity to retain the account)

Good
(knowledge allows timely intervention)
WANT MORE!

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

Example #1, continued

The Churn Prediction Grid

What's WRONG with classic approach?

1. Line ❷'s position is 'continuous' not 'binary'
2. Each customer has different expected value, cost, response, etc.

❷

	Predicted OK	**Predicted Churn**
Actual OK	**Good** (happy customer, good revenue) **WANT MORE!**	**Bad** (Cost incentives to stay, when they wouldn't have left anyway)
Actual Churn	**Bad** (missed opportunity to retain the account)	**Good** (knowledge allows timely intervention) **WANT MORE!**

❶

Cognizant Technology Solutions
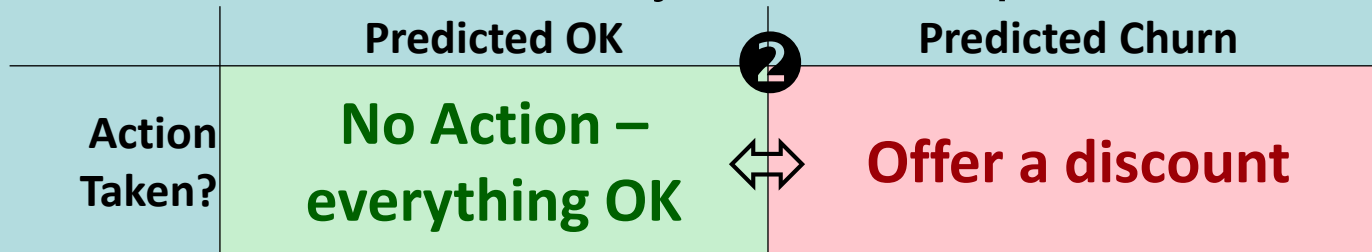
THE CIO LEADERSHIP EVENT
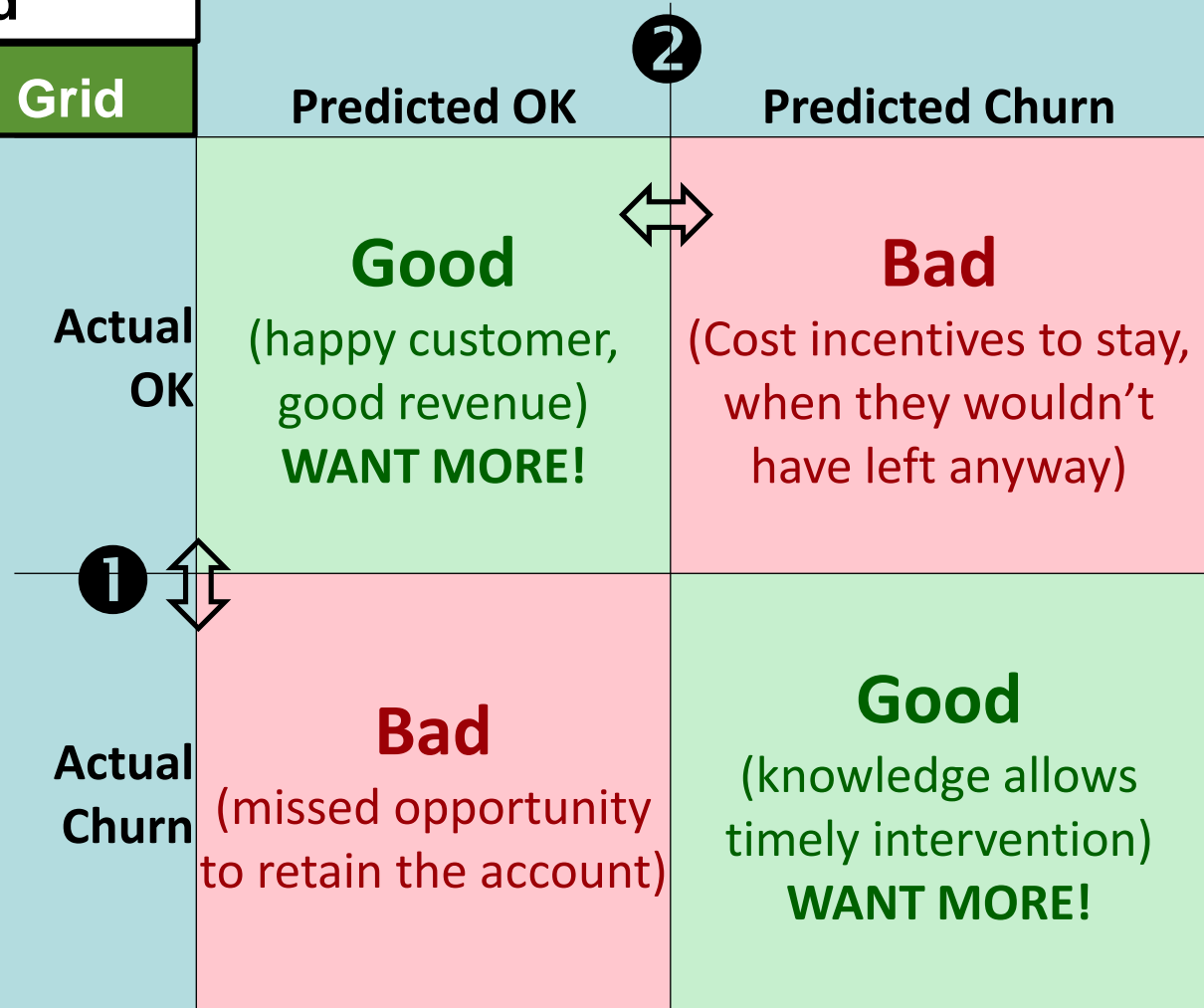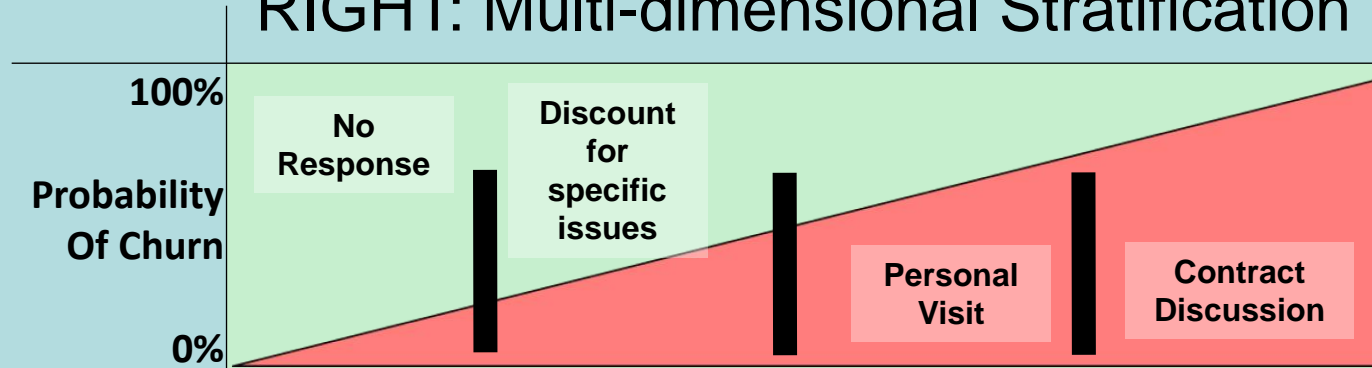
Example #1, continued

A Continuum of Response

Remember, Line ❷'s position = a function of the quality of the churn detection algorithm

WRONG: A "yes" or "no" prediction

	Predicted OK	Predicted Churn
Action Taken?	No Action – everything OK	Offer a discount

❷

RIGHT: Multi-dimensional Stratification

Probability Of Churn — 100% ... 0%

- No Response
- Discount for specific issues
- Personal Visit
- Contract Discussion

© Cognizant 2010

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

Example #1, continued

A Sample Equation

Expected Value = benefit - cost

Benefit = expected value per customer retained **X**

probability that customer will respond to the remediation **X**
actual # of predicted churn clients who *would have churned**

Cost = cost of remediation per client **X**

total # of clients *predicted* to churn

In a "Decision Valuation" approach, ALL of these components of the ROI are multidimensional and nonlinear

* Those who were predicted to churn but did not (false positives) cost you time and money in wasted remediation effort, among other unintended maladies.

Cognizant
Technology
Solutions

THE **CIO**
LEADERSHIP
EVENT

Other Examples

Asking The Right Questions

Decision Valuation means
- enterprise perspective on the data
- multidimensional nonlinear models
- find 'expected values' of multiple choices

✖

✔

(red text, overlapping/illegible) Dran acespotototisanes whatever ecent? toales life? work.

(green text, overlapping/illegible) And any data and from (1), and also to the option, (2) correlate with, (3) times? Did sales fall in prior and subsequent months?

© Cognizant 2010

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

What causes Analytical projects to fail to deliver?

Hint: It's not the technology …

Rarely is the choice of the ***analytical methods*** (mining, regression, CART, etc.) related to project failure

- The scope of information used in the analysis is limited (departmental, not enterprise)

- The wrong questions are asked

- Frequency: The model is not kept up-to-date
  Latency: The data is very old when the model is built

- The results are not deployed to the right process, audience, or situation for decision-making

© Cognizant 2010

Cognizant
Technology
Solutions

THE **CIO**
LEADERSHIP
EVENT

What's Next?

Start Now…

- Rethink or discard "binary thinking" about Decisions. Extend the original problem statement by reframing the questions.

- Use your position in IT or as a CIO to provide a unique *Enterprise-Analytics perspective* to important questions.

- Connect what are currently independent decisions into a common framework.

- Look for Qualitative factors in integrating *Decision Valuation* thinking to your company.

- Pick some high-impact, easily quantified examples to start building a *Decision Valuation* culture and expectation.

© Cognizant 2010

Cognizant Technology Solutions

THE CIO LEADERSHIP EVENT

A three-point summary …

1. You have a unique perspective
   - across departments
   - access to C-level peers and the Board

2. You have complex issues – don't be reluctant to tackle them with Data Analytics

3. Build a program that can span the business and technology sides of Advanced Analytics

Cognizant
Technology
Solutions

THE **CIO**
LEADERSHIP
EVENT

Thank You

Speaker Contacts:

Mark Livingston

Senior Vice President, Cognizant Business Consulting

Mark.Livingston@Cognizant.com 214.459.6934

James Jeude

Practice Leader, DWBI CBC and Analytics

James.Jeude@Cognizant.com   201.673.3682

Cognizant