Forward Thinking for Tomorrow's Projects

Requirements for Business Analytics

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**Role:** Develop new elicitation and modeling methodologies, build business analysis centers of excellence, train industry BAs, work on projects as a Business Architect

**Community contributions:**
- Member of the IIBA BABOK v3 Core Team
- Industry PC for IEEE Requirements Engineering
- Co-chair for Requirements Engineering Education and Training Workshop
- Previous IIBA® Austin Chapter VP of Education
- IREB team member

**Co-Author:**
- *Visual Models for Software Requirements* with Anthony Chen
- *Software Requirements, 3rd Ed.* with Karl Wiegers
Agenda

- Big data and analytics overview
- Analytics requirements approach
- What can I do immediately?
Big data and Analytics have taken over

It’s right, I run

Right again, I just published one of these

Never bought them on this site, but I eat them all the time

Yes, I need that

I am one of these

Most of what we do is about visualization
Ages ago...the Internet was a game-changer

- Looked up people in a phone book
- Were connected to a wall when calling
- Rented a movie cassette
- Folded the map
- Used library cards
- Mailed memos
- Bought CDs
The Internet led us to Big Data
Companies are revolutionizing operations

Big Data and Analytics are today’s game changers
Analytics is coming to a project near you!

Over 90% of F500 organizations are using business analytics.
Poll question?

Are you and your company working on analytics projects?

1. Absolutely, we have lots of analytics projects
2. We are, and I get to work on them
3. Yes, but I’m not working on them myself
4. I’m not really sure
5. No we’re not
BA’s need new skills for these projects

- Understand big data and analytics
- Elicit analytics requirements
- Guide organizations to innovative analytics
The data scientist role

BAs still get to lean on these experts!
What are business analytics projects?

Business analytics projects lead to better and faster decision-making¹
The analytics spectrum

- Standard reports
- Ad hoc reports
- Criteria-triggered alerts
- Statistical analysis
- Forecast models
- What-if scenarios
- Optimizations from predictions
Big Data Defined

Volume

Variety

Velocity
Data is boring, but executive interest increasing

Data drives decisions!
“Intelligence” sums up big data possibilities
Play the part of a car salesperson

AAA-AUTO SALES
Match the car buyer to the car

- Eco-Friendly Hybrid
- Mini-Van
- Motorcycle
- Truck
- Sports Car
But what about Jack?

- Sports Car
- Motorcycle
- Mini-Van
- Truck
- Eco-Friendly Hybrid
What if you had data from facebook?

Patty Rockefeller posted a new photo.

You and 121,568 other people like this.

Briar Rose Awww..... love his soccer photos! He looks just like his daddy. 😊

Jane Jetson When is their next game?
And linked in data? Or text data?

Does Tesla finally have competition? Audi debuts it’s first eco-friendly sportster.
Jack’s choice

AAA-AUTO SALES
Big data will continue to change our lives
- Big data and analytics overview
- Analytics requirements approach
- What can I do immediately?
Requirements lead to successful analytics solutions
Why are requirements for analytics solutions complicated?
Requirements process for analytics projects

Prioritize work using decisions
Define information usage
Specify data needs
Define analyses on data
Prioritize the requirements

Traditional projects

1. BUSINESS OBJECTIVES
2. FEATURES
3. REQUIREMENTS

Analytics projects

1. BUSINESS OBJECTIVES
2. DECISIONS
3. REQUIREMENTS
Identify the decisions executives want to make

- Interview and brainstorm with executives
- Decisions within processes
- Decisions made from reports
An example analytics project

Customer walks by store scan area → Scan customer's face → Match customer face to profile → Select video ad → Display video ad → Update data based on response
Example decision for our scenario

Which video ad should I display when the shopper is at a specific location?
Model the decision requirements

- What question?
- Allowed answers?
- Data inputs?
- Knowledge needed?
- Other decisions first?

Model these in a Decision Requirements Diagram…
Decision Requirements Diagram

Which video ads?

Video ads

Customers

Customer buying history

Facial scan

Who is the customer?

Legal policies for personal information

Which products for ads?

Seasonal trends

Advertising policies

Customer comfort with personalization

Store traffic levels

Products

Adapted from Taylor Decision Requirements Modeling for Analytics Projects, 2013
Decision Tree

Customer recognized?  
Yes → Personal customer data exist?
  Yes → Holiday season?
    Yes → Custom holiday ad
    No → Customer category?
      Yes → Custom ad C
      No → Gender?
        Yes → Male → Generic male ad
        No → Female or unknown → Generic female ad

No → Generic ad
### Decision Table

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Rule 1</th>
<th>Rule 2</th>
<th>Rule 3</th>
<th>Rule 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer recognized</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>-</td>
</tr>
<tr>
<td>Video ad available</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Customer data available</td>
<td>Y</td>
<td>N</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Outcomes**

<table>
<thead>
<tr>
<th></th>
<th>Rule 1</th>
<th>Rule 2</th>
<th>Rule 3</th>
<th>Rule 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display generic video ad</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Display personalized video ad</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No ad is displayed</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>
How are analytics results used?

By people

By systems
How are analytics results delivered to people?

Delivery mechanism

Format

Flexibility
Any different than reporting requirements?

Yes and no!
Data requirements for analytics

- Sources
- Storage
- Management and Governance
- Extraction
Data sources

Questions

Where is data?
What attributes?
Will sources change?

Examples

#1 Source images from social media profiles
#2 Today use: Facebook, LinkedIn, Twitter
Data storage

Questions

Volume of data?
Volume growth plans?

Examples

#1 150K customer records have facial images
#2 Images increase at a rate of 10x/quarter
Data management and governance

Questions

Standardize data sets to store?
Data security?
Archive or destroy old data?

Examples

#1 Encrypt data per legal policies
#2 Store for 12 months
Data extraction

Questions

Speed expectations?
Real-time or batched?

Examples

#1 Display video ad within 3 seconds
Big data structure (or lack thereof)

Structured

Semi-structured

Unstructured
Define requirements data transformation

Data + Analysis = Results!
“There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.”

Donald Rumsfeld
What time-frame do you want to analyze?

- **Past**: What insights about the past are you looking for?
- **Present**: What do you need to understand about the current situation so you can act immediately?
- **Future**: What kinds of predictions or decisions do you want to make?
Creative thinking outside the box

- Decisions?
- Problems or opportunities?
- Tool capabilities
- "What-if?"
- Example solutions
- Expose data for exploring
Evolutionary by nature

Dream state

Ask question → Data → Analytics → Results → Make decision → Done

Reality

Ask question → Different data? → Different Analytics? → Results → Make decision → Ask new question

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Evolutionary by nature

Ask question → Data → Analytics → Results → Make decision → Done

Reality

Ask question → Different data? → Different Analytics? → Results → Make decision → Ask new question

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Dealing with the evolution in requirements

• Start somewhere

• How much will it change?

A little bit

A lot
Big data and analytics overview

Analytics requirements approach

What can I do immediately?
Remember

People don’t look at data for fun, they use data to make decisions
# Requirements models for analytics projects

<table>
<thead>
<tr>
<th>Requirements Model</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Tables</td>
<td>Simple views of the data</td>
</tr>
<tr>
<td>Display-Action-Response models</td>
<td>Interactive dashboards</td>
</tr>
<tr>
<td>Process flows/User stories</td>
<td>Modeling decision scenario, identifying decisions</td>
</tr>
<tr>
<td>Decision Requirements Diagram*</td>
<td>High-level view of key decisions</td>
</tr>
<tr>
<td>Decision Tree</td>
<td>Detailed decision logic</td>
</tr>
<tr>
<td>Decision Table</td>
<td>Detailed decision rules</td>
</tr>
</tbody>
</table>

Find more about these at: [http://www.seilevel.com/ba-resources/rml-requirements-visual-models/](http://www.seilevel.com/ba-resources/rml-requirements-visual-models/)
Watch for pitfalls

! Effects might be real-time
! Incorrectly automated decisions
! Prioritizing the wrong analytics
Read more about big data and analytics

- **Software Requirements, 3rd Edition** (Wiegers and Beatty 2013)
- **Visual Models for Software Requirements** (Beatty and Chen 2012)
- “Requirements for Analytics” whitepaper at [www.seilevel.com/analytics](http://www.seilevel.com/analytics)

- **Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics** (Franks 2012)
- **Analytics at Work: Smarter Decisions, Better Results** (Davenport, Harris, Morrison 2010)
- **Business Analysis for Business Intelligence** (Brijs 2013)
- “Decision Requirements Modeling for Analysis Projects” (Taylor 2013)
- International Institute of Analytics ([http://iianalytics.com/](http://iianalytics.com/))
Topics:

- Agile Methodology
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