Asking Business Questions as an Analysis and Design Technique

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We all know that the Analysis and Design stage of any project work is extremely important.

This is equally true of Business Intelligence projects.

However, many Business Intelligence projects will not use specific BI related techniques.
This is not intended to be an in-depth discussion of Dimensional Modelling – more a method of facilitating the modelling process.

However, those engaged in Analysis and Design stages of BI projects need to understand Dimensional Modelling – at least at a conceptual level.

So I’m going to assume a certain amount of knowledge of Dimensional Modelling and how it is applied in the Data Warehousing context (this knowledge could always be applied after this skill is learned).

Questions

- How many of you who perform BA tasks came from a general BA background?
- How many have received specialist BI training – other than straight dimensional modelling?
- How many of you use specific techniques in capturing requirements and translating them into a design?
More than one method exists – however, this is one that is proved to work well.

Taught at the TDWI World Conference, and advocated by TDWI.

Therefore, is accepted best practice.

It’s not new, and has been in use for several years.
> Understanding Requirements and Facilitating the Dimensional Modelling process can be more easily accomplished by assisting the business in framing specific Business Questions…

> Sounds easy?

> Well, it kinda is!
It’s not uncommon for untrained or inexperienced BI Analysts to have extreme difficulty in understanding and documenting requirements.

A standard IT Business Analyst cannot necessarily be expected to perform this task without additional training and experience. Effective BI Business Analysts have a specialist skillset that sets them apart from general IT BAs (one reason they attract a premium in the market).

However, BAs with a strong ‘Business’ background, and understanding of Database concepts can make very good BI BAs.
When seeking to understand requirements, it’s common for BAs to hear these types of statements:

‘Just reproduce this spreadsheet we’ve always used’

‘We need a report which shows us which customers are profitable’

‘I’ll know it when I see it’

‘We need a list of which vendors we spend our money with’

‘Here’s a list of data fields we need’
Not properly understanding the requirements can lead to incorrect, or just myopic results – delivering less than optimal results.

While you technically might give them what they asked for, you haven’t necessarily given them what they need now and in the future.

Users often don’t know what they may need if they are not facilitated through the process.

This method will assist this process greatly – but it’s not a silver bullet.
There’s a couple of truisms in BI...

‘Users often do not know what they want until they see it’

and

‘requirements can change quickly’
This method will assist you in eliciting a better understanding of the requirements, reducing the risk to the project, and improving the outcome.

It's not perfect, but using a technique such as this will greatly improve the results.
Context
Dimensional modelling
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High-level process
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Business questions
Dimensions and measures
Next steps
Questions
It fits very well into the Analysis and Design processes advocated by many.

- Identify the Business Process
- Identify the Grain
- Identify the Dimensions
- Identify the Measures

Assists with these steps

Context
Dimensional modelling
Best practice
Complexities
**High-level process**
Perspective
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AN ASIDE

WHEN DATA MODELERS GO BAD

"Now! That should clear up a few things around here!"
When undertaking analysis and design work, you should always view the project from the perspective of a (current or future) business process, and the stated business goals.

This doesn’t always happen when interacting with the client who is often thinking, and expressing themselves in terms of a specific part / subset of the entire business process, and from the perspective of how they currently do things.

Taking a step back, and seeing the broader picture often provides the widest perspective and greatest understanding of the wider context.

This may present an opportunity to offer greater improvements to the process.
## Business Questions

1. **What kinds of questions need to be answered?**

   A business question represents anything that a business person desires to know within the scope of the selected business process or goal.

2. **In what form are the answers needed?**

   In a manner that aids understanding of how the information needs to be delivered and utilised.

### Context
- Dimensional modelling
- Best practice
- Complexities
- High-level process
- Perspective

### Business Questions
- Dimensions and measures
- Next steps
- Questions
As with nearly everything in BI, developing the business questions is best handled as an iterative process – exploring the understanding as you progress.

> Step 1 – brainstorming

> Step 2 – Exploration
Step 1 – Brainstorming

> Is a relatively simple process where the business is invited to state their needs in the form of questions

For example, sessions such as these will often start with statements like:

‘We want to identify our most profitable customers’

This is obviously insufficient for our purposes, but is an appropriate start
Step 2 – Exploration

> The business needs to be facilitated by the BA to further explain and extrapolate these questions.

The most value is obtained when the business views this from a business process perspective, and not simply as a basic reporting exercise.

> Asking the business to describe the wider context from the perspective of the business process can do this.

For example: Why is this information needed, and how will it be used by the business?

or

Can you describe the steps in the process where this information is used?

> This will encourage the SME to think about the broader picture.
Step 2 – Exploration

> This may be facilitated by documenting / diagramming the business process utilised by the business (whether currently or desired in the future)

> This is an effective method of seeing the broader picture
Step 2 – Exploration

Business questions should be framed around these to help understand measures and dimensions

> When?
> Who?
> What?
> Where?
> Why?
> How?
Step 2 – Exploration
>
Through several iterations, you can obtain much more detailed business questions

For example, the initial question may be expanded to

‘For the purposes of marketing to new customers, the business needs to understand the various significant segments of the existing customer base (customer segmentation).

The business needs to know how profitable existing customers are over the previous 12 month period by various attributes, including age, sex, geographic location and type of products purchased. This can be overlayed over the entire population to determine which segments should be targeted’

> When this is combined with discussions on the total requirements you may find yourself with dozens of such questions
Step 2 – Exploration

Once the broader set of questions has been collected you need to ensure:

- Questions are clearly stated and non-ambiguous
- The form of the desired answer is understood
- Redundant questions are combined

The questions need to be validated by the relevant stakeholders
This leads onto the next step…

- Turning business questions into actionable information – with the aim of producing a conceptual data model which caters to the stated needs

- Using the broader set of business questions, you can then start to determine the specific dimensions, measures and the required grain
> **Dimensions**

In what context the measures will be viewed

> **Measures**

What facts are required by the business to answer their questions

Often best viewed for a project within a matrix
### Dimensions and Measures

**Figure 6-5** Business matrix for manufacturing supply chain.

<table>
<thead>
<tr>
<th></th>
<th>Date</th>
<th>Raw Material</th>
<th>Supplier</th>
<th>Plant</th>
<th>Product</th>
<th>Shipper</th>
<th>Warehouse</th>
<th>Customer</th>
<th>Sales Rep</th>
<th>Promotion Deal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material Purchasing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Material Delivery</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw Material Inventory</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bill of Materials</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipping to Warehouse</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finished Goods Inventory</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Customer Orders</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipping to Customer</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invoicing</td>
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<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payments</td>
<td>X</td>
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<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Returns</td>
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<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Data Warehouse Toolkit
Ralf Kimball
Building the matrix begins with identifying the Dimensions and Measures from the business questions themselves.

This involves the transition from modelling ‘information’ needs to modelling ‘data’ needs.

Key questions:
- What data is a metric?
- In what context is the measure presented?
- What are the common measures and facts across questions?
First, try to identify the measure that is the focus of the business question.

Some examples:

<table>
<thead>
<tr>
<th>Question</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘What are the costs of…’</td>
<td>Cost</td>
</tr>
<tr>
<td>‘What is the profitability of…’</td>
<td>Profitability</td>
</tr>
<tr>
<td>‘How many students…’</td>
<td>How many (Count)</td>
</tr>
</tbody>
</table>

You may prefer to re-phrase some of these questions to be more meaningful to the process.

Eg. ‘How many students…’
    may become ‘What is the number of students…’

Questions may be phrased to include multiple measures, but these should be separated into separate questions and treated as separate measures.
Dimensions are typically the words associated with ‘by’

Some examples

<table>
<thead>
<tr>
<th>Question</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Costs by <strong>product line</strong>’</td>
<td>Product line</td>
</tr>
<tr>
<td>‘Profitability by <strong>age</strong> &amp; <strong>sex</strong>’</td>
<td>Age Sex</td>
</tr>
<tr>
<td>‘Students by <strong>postcode</strong> &amp; <strong>course</strong>’</td>
<td>Postcode Course</td>
</tr>
</tbody>
</table>
Question 1

‘The business needs to know how profitable existing customers are over the previous 12 month period by various attributes, including age, sex, geographic location and type of products purchased’

Measure: Profitability

Dimensions: Time (previous 12 months), Age, Sex, Location, Product type
Example of how an iterative process can work. A time dimension of ‘previous 12 months’, or a regular dimension of ‘Location’ are probably not sufficient. More flexibility around the time context is probably required, and more work will need to be done to better understand the meaning of ‘Location’

Often these ‘conceptual’ dimensions are a precursor for discussions that lead to many more individual dimensions (or levels in a hierarchy).

Eg. Country, City, State, Postcode, etc.
The information gained through this process fits neatly into the broader design process, you can then perform all the usual steps in completing the design.

This should include (amongst other things)

- Look to understand inherent hierarchies in Dimensions i.e. individual levels within dimensions
- Look to conform dimensions
- Decide on type of Slowly Changing Dimension
- Etc.