



BI KnowledgeShare whitepaper



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**SAP BI**

# Positioning the InfoCube in BI

SAP BI Optimization series  
InfoCube guidelines

software engineering | automation | SAP BI

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The role of InfoCube in SAP BI

### Key to BI reporting Optimization - InfoCube

Getting clarity of the role of the InfoCube is most critical in BI Architecture and modeling. Differentiating that the ODS is the data layer and the InfoCube the reporting layer is integral to success in Information delivery

The top four reasons for failure in InfoCube modeling can be summarized as follows

1. Has always been a manual process thus has become more of an art than an architecture
2. Critical C4 impact analysis is impossible to perform for any InfoCube modeling
3. All InfoCubes have been modeled with a best guess modeling estimated, even SAP Business content Infocubes
4. InfoCube modeling is complex and time consuming as it is

### Problem Statement

1. InfoCube modeling is extremely complex to get it entirely right?
2. Show us the skill profile of a successful and a not-successful Business Intelligence Architect?
3. What are the fundamental Architecture 'Critical components' that can decide the success or failure of BI Architecture?

### Background information

1. The fundamental basis of this paper is an agreement that if all other considerations are constant then the InfoCube is a more efficient InfoProvider that the ODS/DSO from reporting.
2. Manual modeling is a very complex task, infact it is so complex that it cannot be done in any optimal manner
3. Even SAP delivered InfoCubes may not be technically optimized and have a potential for optimizing

Just as an example:

A '4 dimension' , '7 characteristic' InfoCube has 47 ways it can be modeled.

A 13 dimension , 50 characteristic InfoCube has over a billion ways it can be modeled.

Manually considering a billion options for an optimal design is impossible.

Automation checks more than a billion possibilities against C4 checks, explained later in this paper, and provides an optimal design very rapidly.

### Modeling for SAP BI:

- Know how the placement of each characteristic in a dimension with impact its C4 attributes
- Develop good problem solving skills by learning the relationships between dimensions, characteristics and their impact on C4 attributes
- Solve skills by learning and always employing scientific and proven methods of execution based on best practices and experience.
- Access team strengths and weaknesses and leverage collective strength for all tasks
- Visualize modeling impacts where possible
- Keep team always informed on all impacts, failures and successes.
- Focus tactical developments on processes, Standards and BI Strategic guidelines

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*Develop & encourage management skills*

*Perform C4 impact Analysis*

### Introduction

How to architect and model a SAP BI environment should create conflict in any workplace, due to the sheer fact that so far it has been an art form and not based on any structured rules.

SAP has provided ODS and InfoCube guidelines, however these were designed for kinder garten architects and modelers and are not really recommended for mature BI organizations. One example is the recommendation that all atomic data must be located in ODS/DSO and Infocubes must only be used for summarized reporting. However, mature architects both within SAP and outside will easily be able to challenge this statement. The question to be asked is 'Leaving all other factors aside which InfoProvider is better for reporting InfoCube or DSO?'

So as a mature organization what guidelines should a BI manager follow for modeling Infocubes?

First we had 'lean manufacturing' that turned the world of manufacturing into a balanced and measurable metric that could be measured, tolerances mapped and Manufacturing efficiencies reported via advanced analytics.

Now we are heading into the domain of 'Lean BI'.

Mechanical automation is highly technical and complex, and requires several years of training and work experience to become proficient in automation technologies. At the same time automation technology always improves performance and lowers operational costs. Automation technology is also constantly evolving and encompassing more and more processes and replacing manual, entry level, subjective decision processes with highly integrated and measurable metrics. Simple automation may be complex but complex automation could make things simpler.

Because traditional modeling of InfoCubes is a manual process we shall find resistance from artists and creative manual modelers. However managers and subordinates soon realize that the inherent advantages of their positions, and their work quality, aligns with automation of complex manual processes. As a simile just imagine building a modern automobile with last century manual processes. Why then continue with manual InfoCube modeling if there is an automation alternative.

Here are a few suggestions.

### Management as the Lead

Good processes, standards, and governance must commence with management, who drive the creation of a 'Company wide BI Cookbook' consisting of enterprise-wide standardized processes to be followed in all development activities. This defines how every BI activity must be performed, i.e. all reporting must be provided from MultiProviders. The fundamental methodologies must not become static, but evolve with change to react to dynamic changes. Simultaneously no alternative must be allowed unless the book of facts is changed.

The goal of BI administration must be to firstly define and align the BI strategy to business strategy goals. It must document and communicate strategic standards, processes and methodology, and it must keep this document dynamic based on new functionalities and expert experience. All recommendations must be based on SAP 'best Practice' recommendations and guidelines based on multiple expert feedback backed by proven customer experiences.

Management must work with their teams to maximize utilization of available assets and encompass any facet of automation whether it is in transformation, data quality profiling or InfoCube modeling. Automation always leads to higher efficiencies, predictable performance, and lowered operational costs.

Good process automation must pre-consider various options, review all alternatives and provide the best alternative available. In addition it must perform critical tests and assure that the automation process is in fact optimizing the processes.

### InfoCube Modeling

One of these tasks is InfoCube modeling.

InfoCube modeling demands four critical checks, which are never pursued due to lack of time, budget, skills or all three.

We call them the C4 checks. There are the fundamental rules of InfoCube checks in any modeling or re-modeling of an InfoCube must check for.

**C1** basically checks Information Quality impact. The baseline for this Impact analysis starts with 'as-Is' reporting objects and report priority. This check does not check for Data quality. The c1 check works on a base assumption that the data quality is a given and then proceeds to audit that the reporting capabilities of the InfoCube are not compromised. That is, if we had 12 reports being delivered from the InfoCube this audit checks that the 12 reports are still deliverable and that no information content has been compromised, neutralized or deleted by mistake.

**C2** checks Data Load impacts. The baseline is the current time taken to load data into the InfoCube. All subsequent InfoCube model versions must be compared against the baseline to visually review C2 impact, i.e. the anticipated improvement or degradation to data load performance into the InfoCube based on the new designs.

**C3** checks Query response impact. The baseline for the check again is the current system load on reporting from the InfoCube. All subsequent InfoCube model versions must then be compared for Query Runtime impact for each change suggested, i.e. the anticipated improvement or degradation of Query performance.

**C4** checks the footprint of the InfoCube in the BI, the baseline for this check is the current space occupied by the InfoCube. All subsequent InfoCube model versions must then be compared for BI footprint impact, i.e. the amount of space the InfoCube occupies in the SAP BI environment.

A "good" BW manager understands the work they ask their subordinates to execute must be tasks they are capable of performing and that they possess the requisite skills to do the assigned tasks. This knowledge and capability allows the manager to monitor performance and progress and to avoid problems associated with the human interpretations and associated errors in InfoCube modeling.

A good way to accomplish this is to build independent skill profiles of each subordinate and then overlay them into a consolidated skill map of the whole team to visually identify both individual and team skill profile.

Good modeling begins with good architecture. A good architecture must encompass technology, Data Quality, Information, Business units, and organization architectures all at the same time. Then proceed to harmonize them into a single coherent BI Architecture.

### Managing BI resources:

*A good BI manager*

- Must be business facing and have excellent understanding of functionalities, capabilities and limitations of different aspects of BI
- Must manage and not get into hands-down problem solving as that detracts them from their primary task of management
- Must understand strengths and weaknesses of their current models
- Must know the strengths and weaknesses of each InfoArea to optimize resource mix and allocations geared towards strategic success
- Must understand critical aspects business needs and functionalities that can meet them

*Technical background is necessary to relate to technical details but often does not relate well as a business facing, business interacting personality. Technical managers tend to be inward/ IT/ technology focused and not need focused.*

*Functional background is necessary to relate to business with a clear comprehension of limitations and capabilities of SAP BI. Functional managers tend to be business focused and more concerned with teams and team dynamics. They always prompt team members for optimizing solutions*

*Choose Technical for IT facing and functional for Business fulfillment.*

### Understanding Infocubes

- Many types of cubes for many reporting options
- Are non destructive objects
- Data cannot be destroyed only changed. Change log is maintained
- True data Warehouse e reporting layer
- Leverage for reporting as far as possible
- Use for detailed and summarized reporting
- Modeling is the key to success

### Understanding ODS/DSO

- Many types of DSO for many reporting options
- Are non destructive objects
- Data can be destroyed and changed. Change log may be maintained
- True data Warehouse data layer
- Can leverage for reporting
- Use for detailed data holding
- Can be reporting enabled or not
- Non reporting oDS load faster
- Write optimized DSO need to be re-loaded in each cycle

Good modeling is simply utilizing all best practices and past experience to build models that qualify the C4 impact optimization.

The problem with the above statement is that good modeling is not currently possible. To manually conduct C4 checks one would have to build many InfoCubes, load each one of them with full data, build queries in each of the InfoCubes, and then run stats on each one of them. This can easily take anywhere from 25 to 40 days per Infocube. This is not acceptable to most companies. So the end result is a subjective model that has undergone no comparative impact analysis.

This is where Automation of InfoCube becomes an imperative option towards BI success.

**Automation** → Elimination of Human errors → higher quality → higher efficiency → lower operational costs = **Progress**

This in turn gives the BI team more time to do higher value-add tasks.

### InfoCube vs. ODS/DSO

Two of the most important traits of Infocubes, when compared to ODS/DSO, are indices and dimensional capabilities.

Indices and dimensional capabilities are extremely important in day-today reporting because they collectively shorten the query time horizon of 'selective reporting' requirements in a dynamic environment of ever changing reports and reporting needs. In simpler terms if there are 22 regions and you need to analyze a single region in a report – the InfoCube dimension and indices will only access the query dimension whereas the ODS/DSO query will need to access all the regions and then selectively provide the region requested during run-time.

Most SAP BI professional, both inside and outside SAP, would agree that an InfoCube is the preferred reporting object both for atomic and summarized reporting. There should be few situations, from a Query performance point of view, where an ODS/DSO could ever outperform an InfoCube, if any.

### ODS/DSO as a reporting object?

Some assumptions why companies continue to use ODS/DSO as a preferred reporting InfoProvider could be

- **SAP said so** – probably the most common reason of all
  - During earlier days, when Sap just got familiar with ODS, they released an ODS modeling whitepaper that recommended that due to the ODS being a reporting object
  - Due to this whole organizations have been warehousing detailed data in flat-file data bases of ODS, and only taking summarized data into InfoCubes.
  - Numerous BI teams found the destruct capabilities of ODS/DSO to their advantage to adapt to the every changing reporting needs of business users. Not strategically positioning an InfoCube, or MultiProviders, as the true reporting layers in the SAP BI EDW environment.
  - Some companies continue to deliver majority of the reports from the ODS/DSO environment
  - **An alternate is to review with SAP and select BI experts the pros & cons of InfoCube and DSO reporting and finalize a strategic reporting layer that conforms to best practices and operational efficiencies. One method would be to take the largest and most complex ODS and convert it into an ODS and check against all technical and business needs to finalize the decision. It would be necessary to model a C4 optimized InfoCube to have any reasonable decision analysis to this scenario**

- **Data load time** – seen in large ‘High volume low value high volume’ enterprises
  - As Infocubes take longer to load some modelers replace the reporting object to a DSO, normally a write optimized DSO. Issue with write optimized is that it must be a full-reload per every load cycle.
  - **An alternative could be to review automatic remodeling of DSO into a C4 optimized InfoCube, or remodeling an InfoCube to optimal C4 capabilities. There is a high possibility that the delta InfoCube load time may be shorter than the full DSO load time. This then changes the whole dynamics of the DSO vs InfoCube as a reporting object decision**
- **Extremely fast changing reporting requests** – seen in ‘low volume high value’ enterprises
  - One customer is currently taking all reporting objects from Infocubes to ODS/DSO.
  - The reason provided is the sheer dynamics of the demands of information users.
  - This is an example of lack of documented processes, standards and governance where the change frequency could compromise the basic best practices of the EDW environment.
  - An alternative is to review the Architecture of the BI environment from a ‘self-service’ design capability. In a well designed EDW environment, strategically modeled for ‘self-service’ there should be more of a silo of vertical flow of data.
  - Against this is the architecture that is not driven by data warehouse fundamentals but by report mart designs. In such architecture, either due to lack of a proper BI Architecture strategy or the sheer pressure of the business owners to deliver every report yesterday the data warehouse principles break down.
  - **An alternative could be to conduct an Architecture audit towards identifying the delta from EDW best practices and best practice usage of InfoProviders. In such cases there is a high possibility that report marts will need to be merged into Silo InfoCubes and modeled in accordance to C4 impact optimization. In such cases the only option would be to leverage automated InfoCube modeling tools to realign the architecture towards meeting business needs.**

### InfoCube vs ODS/DS for BI Accelerator

#### As-Is status of BIA

One of the most current BI Accelerator statements is that the BIA only accepts InfoCubes for indexing. This translates into a fact that only the InfoCube data will be accelerated. Which further translates into Murphy’s law ‘ If something has to break, it will, in BI Accelerator terminology the report will only run as slow as the slowest InfoProvider, i.e. the ODS/DSO. (also request whitepaper ‘The Application Layer in BIA’

Stated earlier

Most SAP BI professional, both inside and outside SAP, would tend to agree that an InfoCube is the preferred reporting object both for atomic and summarized reporting, and for indexing into the BIA

#### Translation

If you have any ODS/DSO object associated with your report then the BI Accelerator is a resource that is wasted due to the fact the ODS/DSO will become a ‘Query Performance Drag’ to the report in question. This is similar to spending a million dollars on installing a jet engine in your racing car and then keeping you foot pressed firmly on the brakes all the time. Could either be a waste of investment or negative utilization of resources – both bad scenarios.

#### Fact

1. InfoCube must remain your preferred reporting InfoProvider of choice, both for detailed and summarized reports.

### Understanding BI Accelerator

- Is designed for SAP BI
- Will encompass SAP apps
- Is not the proverbial Black Box appliance
- Need support and RACI planning
- Has 3 distinct layers of support

### Supporting BIA

#### Layer 1

- **Appliance layer**
- Done by HW vendor
- Appliance support
- Storage/ Files
- All software other than BIA
- All hardware

#### Layer 2

- **BIA SW Layer**
- Done by SAP
- SAP Support
- BIA Software support

#### Layer 3

- **Application layer**
- Done by company
- Which cubes
- Which ODS/DSO to Cubes
- Indexing Cubes to BIA
- Data reconciliation
- Process chain management
- Load to BIA Admin
- BIA Planning
- BIA Blade forecasting
- BIA Alert management
- BIA Support escalation

## 2. Conversion of ODS/DSO to InfoCube must be a logical next step to BI Accelerator installation

### To-Be status of BI Accelerator – planned for Dec 2009

SAP has already announced that the BIA will be able to index data from ODS/DSO built for BIA. This functionality is planned to be available in Dec 2009.

However we would like to clearly state that the BIA analytics will run more efficiently if they pass through the Dimension modeling of an InfoCube

### Translation

Query response will always be better from an InfoCube no matter if you are reporting from the BI and passing through a BI Accelerator.

ODS/DSO is a flat file format and for selective analytics the query has to pass through every record, i.e. a specific Regional analytic- in an ODS report the query will have to run through every region no matter how you model it. In and InfoCube it will only access the respective region if modeled accordingly.

### Fact

InfoCubes will always remain the preferred InfoProvider to BIA, even when the functionality of ODS is provided by SAP. If ODS/DSO will be used to load into BIA due to load times consider Automated Modeling for InfoCubes as a POC to review change to strategic InfoCube utilization.

## Conclusion

**If anywhere you see an automation option to any manual process embrace it readily**

Automation leads to

- ➔ Elimination of Human Errors
- ➔ Higher, consistent and reliable Quality
- ➔ Higher efficiency
- ➔ Faster turnaround
- ➔ Lower Operational costs
- ➔ PROGRESS

Request for a demo of our Automated InfoCube modeling options for BI and see how simple we have made one of the most critical and complex Tasks of BI Modeling.

No one expects perfection from a manager. However a manager must plan to continue to work smarter and not harder, must continue to be business facing and not technology focused, must continue to meet strategic business needs and not accomplish technical wonders.

Finally the sweetness of the pie is in Business User satisfaction.

#### About the Author:

*Hari Guleria is a Sr BI Value Architect. He is a 'BI Business Value Strategist & Architect' at BI DataBridge and erada Inc launching SAP BI software products like SmartCube (automated InfoCube modeling), BIA Workbench (tool for BIA administration) and RapidPro (ABAP optimization tool). The team is currently working on a 100% BI Data Profiling, Scoring and Management tool and a 'BO SmartUniverse' due for release in 2009*

*Hari routinely works with customers as their business value Architect, i.e. building sustainable BI methodology by working with business owners and vendor partners, assuring SAP and SAP BI Business Value enablement. Hari is highly business need focused. His strength is in BI Strategy, Architecture and Business Value assurance, and assisting BI customers realize their business goals.*

*Prior to this Hari worked at SAP America with their Value Realization group focusing on SAP BI strategy and value audits. Before that Hari held national BI & EP practice director roles with major SAP premier partner companies. Hari started SAP with Andersen consulting (now Accenture) in Saudi Arabia in 1995.*

*Prior to SAP Hari comes with over 9 years of Sr. sales, marketing and strategic planning experience with European multinationals. He has been assisting customers meet their SAP R/3 business goals since 1995 and BI goals since 1997. He has been a regular speaker at ASUG, and BITI national conferences. Hari has over 14 full life-cycle SAP projects under his belt.*

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