Metricus

Metricus Data Management Architecture

Introduction

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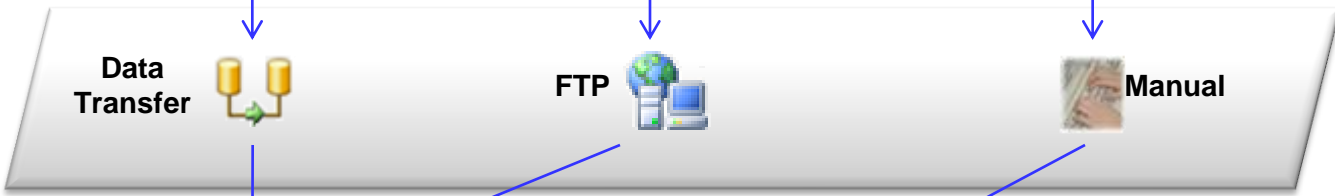➢ **Microsoft Business Intelligence**

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Data Management Architecture

Metricus

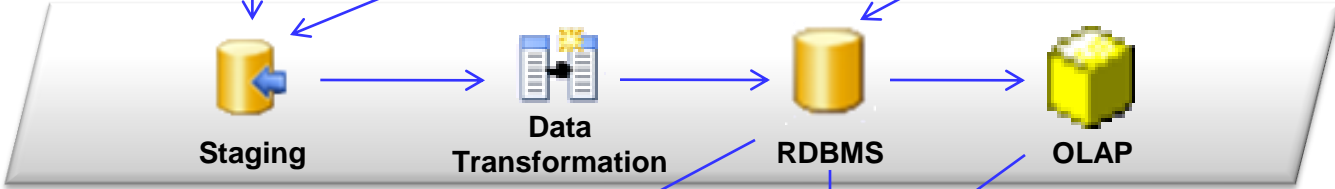| Overview	Data Sources	Data Integration	Data Mart	Platform

Source Data

RDBMS Text XLS XML Qualitative

Customer Data Sources

Integration Tasks

Data Transfer FTP Manual

Metricus
IT Performance Data Integration

Data Mart

Staging Data Transformation RDBMS OLAP

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IT Performance Data Mart

Presentation

Reporting Services Performance Point Share Point

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Business Intelligence

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Data Management Architecture

Overview	**Data Sources**	Data Integration	Data Mart	Platform

Overview

Quantitative - Structured

Quantitative - Unstructured

Qualitative

→ Metricus supports the extraction, transformation and loading of data from the 3 main types of data sources associated with the measurement of IT Performance

1. Quantitative structured data

2. Quantitative unstructured data

3. Qualititative data

→ An understanding of types of data sources, knowledge on the advantages and disadvantages of using a type of data source, as well potential issues is critical to the successful implemention of IT Performance Measurement

Data Management Architecture

Overview	**Data Sources**	Data Integration	Data Mart	Platform

- Overview
- **Quantitative Structured**
- Quantitative - Unstructured
- Qualitative

→ ***Quantitative structured*** data is contained in relational databases and supported by IT and business applications

→ Most common, and preferred source for IT service related metrics

Service Desk	Enterprise Systems Management	Enterprise Resource Planning	Custom
e.g. FrontRange HEAT, HP OpenView Service Desk, Remedy IT Service Management, CA Unicenter ServicePlus Service Desk	e.g. IBM Tivoli, HP OpenView suite, CA Unicenter	e.g. SAP, Oracle Financials	Internal IT applications developed specifically for IT support/delivery functions

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Data Management Architecture

Overview	**Data Sources**	Data Integration	Data Mart	Platform

Overview

Quantitative Structured

Quantitative - Unstructured

Qualitative

→ *Quantitative unstructured* data represents data that is stored in 'satellite' sources e.g. emails, spreadsheets, word documents, etc

→ Extraction of quantitative unstructured can sometimes be automated however usually more cost-effective to manually enter data.

→ Often represents a temporary data source for IT Peformance Metrics as efforts should be make to store the data in a structured format.

→ Not a realiable data source for supporting operational data

→ A good source of supporting information for IT Performance Metrics

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Data Management Architecture

Overview	**Data Sources**	Data Integration	Data Mart	Platform

Overview

Quantitative Structured

Quantitative - Unstructured

Qualitative

→ *Qualitative* data represents data that is not stored physically in a structured or unstructured format i.e it is stored in a persons brain ☺

→ A very important source of data

→ Often not realistic to quantify or structure this type of data

→ Many IT Performance Metrics of a management or governance nature or qualitative

→ Metrics that represent 'mile-stones' are often qualitative

Data Management Architecture

Metricus

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Architecture

Manual Data Entry

File Transfer

Source Connection

Metricus **IT Performance Data Integration**

→ Metricus IT Performance Data Integration provides the mechanisms and functionality associated with the 3 core types of data integration associated with the measurement of IT performance;

1. Manual Data Entry

2. File Transfer

3. Source connection

→ The next 3 slides presents an overview of Metricus IT Performance Data Integration. A detailed look at actual functionality is presented in M5.3 – Metricus Data Integration

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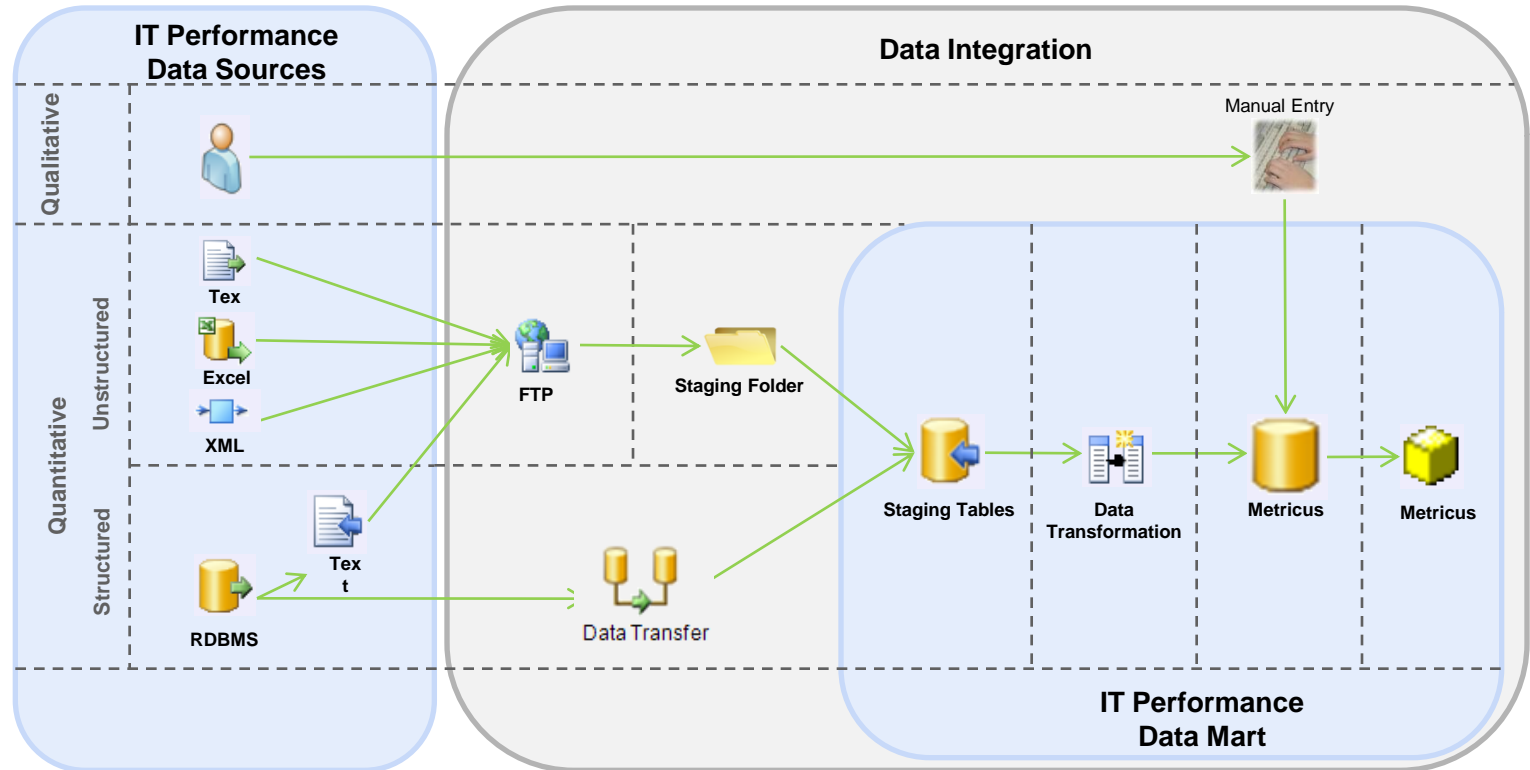# Data Management Architecture

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Metricus Data Integration Architecture

IT Performance Data Sources

Data Integration

Qualitative

Quantitative

Unstructured

Structured

Tex

Excel

XML

Tex t

RDBMS

FTP

Staging Folder

Data Transfer

Manual Entry

Staging Tables

Data Transformation

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Metricus

IT Performance Data Mart

Data Management Architecture

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Manual Data Entry - Overview

→ Involves manually entering actuals for identified IT Performance Metrics directly into the Metricus IT Performance Data Mart

→ Should not be used for quantitative structured metrics unless security, data quality, logistical or resources issues prove inhibitive or cost ineffective

→ More often suitable for quantitative unstructured metrics where the cost of automation exceeds the cost of data entry

→ Required for qualitative metrics

→ Not suitable for metrics with a small latency or high granularity

→ Suitable for entry of targets and benchmarks

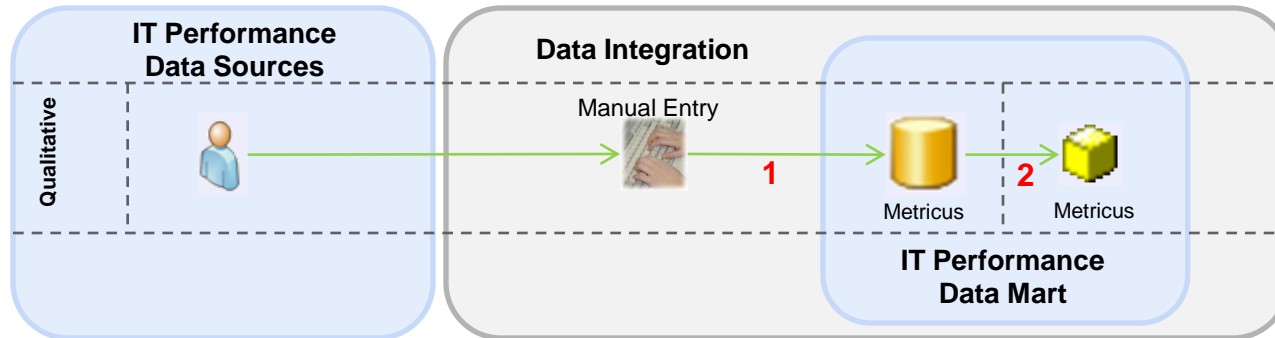# Data Management Architecture

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Manual Data Entry - Architecture

IT Performance Data Sources

Data Integration

Qualitative

Manual Entry

1

Metricus

2

Metricus

IT Performance Data Mart

Task	Description
1	Period actuals for selected metrics are manually entered by the metric owner. Trends and scores for metrics are updated automatically by Metricus
2	A daily scheduled task reprocesses the Metrics cube. This can be performed manually

Data Management Architecture

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Manual Data Entry - Examples

1. A spreadsheet is maintained with all software licenses within an organisation. An attribute is updated indicating if the software is in use. This provides the values for the **% Unused Software Licenses** which are entered manually once a month

2. The **% IT Costs to Organisation Revenue** metric that can be obtained via email monthly or quarterly from Finance

3. The **IT Risk Events** metric is likely to be manually collated from both incident data within the Service Desk environment and anecdotal data obtained by IT operations staff

4. Due to the complexity of obtaining the underlying data, values for **% Enterprise Data Model Complete** metric will probably be a best guess from an SME

Data Management Architecture

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Manual Data Entry – Pros/Cons

Advantages

The ability to enter metrics manually into Metricus provides the capability to handle qualitative metrics. Depending on maturity of IT operational systems, qualitative metrics can range from 30-40 % to 100% of IT Performance Metrics .

Qualitative metrics provide for 'overrides' when poor data quality exists in underlying operational systems

Enables rapid implementation of Metricus due to the absence of logistical issues and development associated with file transfer and source connection data integration methods.   Often an effective way to prototype or provide 'proof of value' or 'proof of concept' implementations

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Disadvantages

Latency – qualitative metrics are often only entered weekly or monthy. For some types of operational metrics this may not provide sufficient analysis and trending capabilityies

Lack of supporting data – qualitative metrics often do not have supporting data to justify the value of the metric. This can feed into accountability issues for poorly performing metrics

Procedures and processes need to be put in place and monitored to ensure that qualitative metrics are entered in an accurate and timely manner

✖

Data Management Architecture

| Overview |
|:---:|
| Architecture |
| Manual Data Entry |
| **File Transfer** |
| Source Connection |

File Transfer – Overview

→ Involves the extraction of data from a quantitative structured or unstructured data source into a standard file transfer medium.

→ The data file is transferred from the source environment to the host environment and uploaded into the Metricus IT Performance Data Mart

→ Appropriate for quantitative unstructured data

→ Data transfer files can be used as a medium to collate/collect qualitative data

→ Data transfer medium can be any standard formats e.g. CSV, TXT, XML, XLS, MDB, etc

→ Data must be structured within the data transfer medium

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File Transfer – Architecture
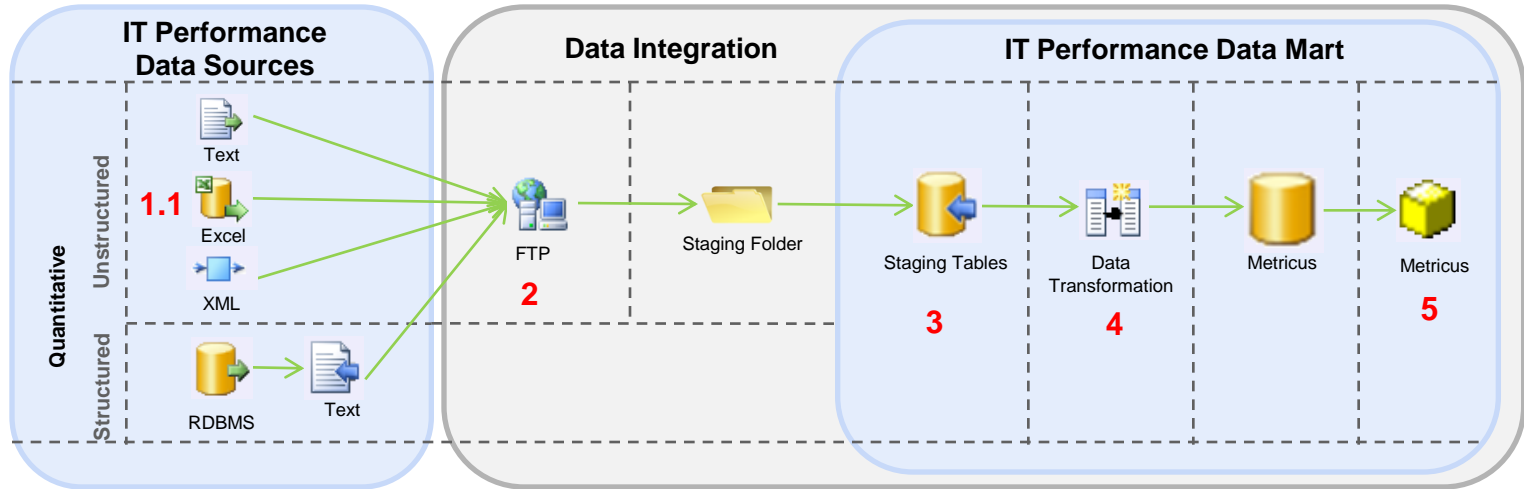
Task	Description
1.1	IT performance data made available on customer network in text, XLS, XML, etc
1.2	IT performance data made extracted from source operational systems and stored on customer network in text format
2	Automated FTP task to copy data to staging folder on Metricus Hosting Server
3	Automated task to copy data from staging folder into staging tables within IT Performance Data Mart
4	Data transformation tasks applied to staging data to transform data into ITE and Metrics tables
5	Data integration tasks to populated Analysis Services Metric cubes

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File Transfer – Examples

1. HP OpenView Service Desk has standard views which extract data into text format .   This is run daily and a copy is transferred to the Metricus Hosting server. Many standard IT Support/Operations metrics are available from these extracts e.g. SRs Created, Incidents Open, Changes Implemented within Target (by Priority), etc

2. A customer outsources server management to a Managed IT Service provider. This provider produces operational metrics and provides them back to the customer via file transfer (XLS, Text, etc). This data can be used to populate IT Performance Metrics related to IT Delivery

3. CA Unicentre is used.   It provides ad-hoc data extracts via the standard web interface. These are manually loaded into Metricus on a regular basis.

Data Management Architecture

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File Transfer – Pros/Cons

Advantages

Bypasses the main issue with source connections – the logistics associated with connecting directly to an operational data source.   These include security issues (firewall, authentication, data) and potential impact on the performance of operational systems

Reduced development time due to not having to programmatically map complex underlying data structures to IT Performance Metrics

When data is sourced from 3rd-party suppliers it is often only available via pre-defined text extracts

Often required extracts for IT Performance Metrics already exists. These can be pre-built by applications associated with the systems or custom written by IT for the purposes of operational reporting

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Disadvantages

Existing data extracts may be large and/or not available on a regular basis.   Furthermore, changes to existing data extracts can be very difficult

Can be more difficult to automate and maintain than source connectivity. e.g. if UID/PWD's for FTP change regularly then these details needs to be changed in the data integration tasks

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Data Management Architecture

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Source Connection – Overview

→ Involves extracting data automatically from an operational data source directly into the Metricus IT Performance Metrics Metadata

→ The preferred option for quantitative structured data

→ Possible, but difficult to use with quantitative unstructured data

→ Decision to automate is based on ;

- analysis requirements for underlying supporting data

- costs involved in setting up automations vs using existing extracts or manual data entry

- logistical and security issues associated with connectivity to underlying data sources

→ Most commonly used with IT Service and Operations data

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Data Management Architecture

Overview	Data Sources	**Data Integration**	Data Mart	Platform

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Source Connection – Architecture
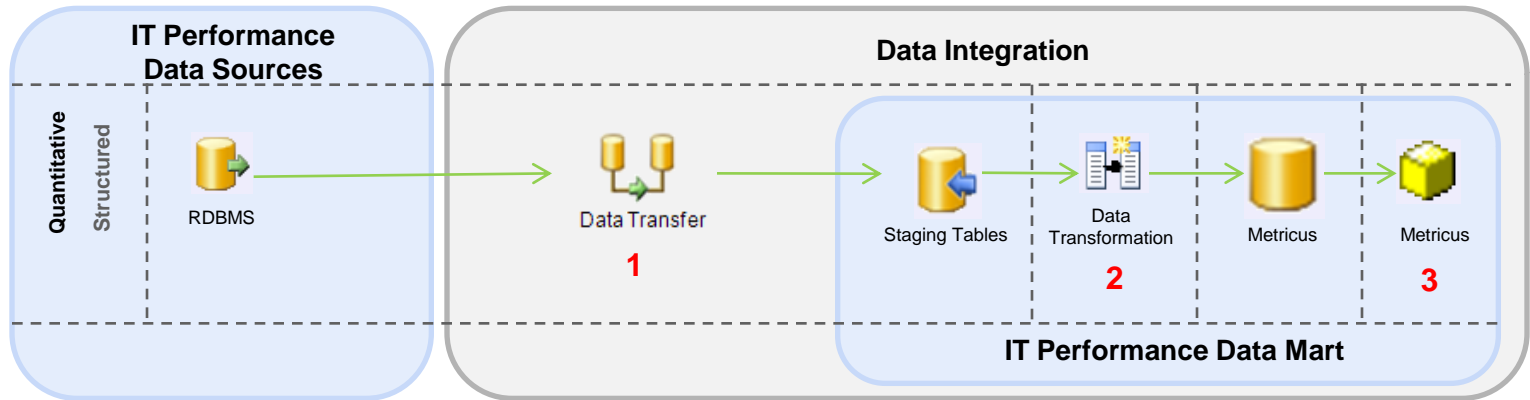
Task	Description
1	IT performance data extracted directly from operational data source on customer network to staging tables on Metricus Hosting Server
2	Data transformation tasks applied to staging data to transform data into ITE and Metrics tables
3	Data integration tasks to populated Analysis Services Metric cubes

Data Management Architecture

Overview	Data Sources	**Data Integration**	Data Mart	Platform

- Overview
- Architecture
- Manual Data Entry
- File Transfer
- **Source Connection**

Source Connection - Examples

1. A connection is setup direct to the Oracle database hosting BMC Remedy on the customer site.   Data for all core IT Service/Operations metrics is automatically populated through Metricus on a daily basis

2. A connection is setup directly to an instance of HP Openview Reporter on a customer site.   Availability and Performance metrics can be directly transferred on an hourly basis with negligible impact on the source systems.

3. A connection is established to the ERP environment of the customer in order to extract data related to Workforce and Financial IT Performance Metrics e.g. IT Revenue, IT Costs, IT Resources, Average Training Days, etc

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Source Connection - Pros/Cons

Advantages
Can by fully automated and very cost-effective over the long term
Provides for high granularity and latency as extracts can be scheduled at regular intervals with less overhead than file transfer   (Note: this is only really relevant if data is required more frequently than daily)

✓

Disadvantages
Changes are often made in underlying systems without notification to the recipients of the data
Initial setup costs can be higher than for manual data entry and file transfer data integration methods. Largely due to understanding customisation of operational data sources
Initial setup often requires resource availability from the customer. This can delay implementations and prove troublesome from a political perspective

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Data Management Architecture

Metricus

Overview

Calendars

IT Entity

Metrics

Staging

OLAP

→ The Metricus IT Performance Data Mart contains a set of relational data structures to store:

- Business Calendars
- Staging data
- IT Entity data
- Metric values
- Fact tables for OLAP
- Dimension tables for OLAP

→ Each customer setup in Metricus as a dedicated, secure relational database

→ Metricus IT Performance Data Integration provides the functionality required to manages relational data within the Metricus IT Performance Data Mart

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Data Management Architecture

Overview	Data Sources	Data Integration	**Data Mart**	Platform

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Calendars - Pros/Cons

→ Business Calendars are required to correlate IT Performance Metrics with the decision making timeframes of an organisation

→ Levels defined (year, quarter, month, week, day) in the business calendar effect the storage, summarisation and display of IT Performance Metrics

→ Storage granularity can be at different levels of a business calendar for different metrics

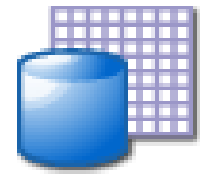→ Metricus supports an organisation with multiple business calendars

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Data Management Architecture

Overview	Data Sources	Data Integration	**Data Mart**	Platform

- Overview
- **Calendars**
- IT Entity
- Metrics
- Staging
- OLAP

Calendars - Tables

Example: Calender table :

	Column Name	Data Type	Allow Nulls
🔑	Date	smalldatetime	☐
	[Year Str]	char(4)	☑
	[Month Str]	char(6)	☑
	[Year Int]	int	☑
	[Month Int]	int	☑
	[Day Int]	int	☑
	[Day Str]	char(2)	☑

Date	Year Str	Month Str	Year Int	Month Int	Day Int	Day Str
27/12/2007 12:00:00 AM	2007	Dec 07	2007	12	27	27
28/12/2007 12:00:00 AM	2007	Dec 07	2007	12	28	28
29/12/2007 12:00:00 AM	2007	Dec 07	2007	12	29	29
30/12/2007 12:00:00 AM	2007	Dec 07	2007	12	30	30
31/12/2007 12:00:00 AM	2007	Dec 07	2007	12	31	31
1/01/2008 12:00:00 AM	2008	Jan 08	2008	1	1	01
2/01/2008 12:00:00 AM	2008	Jan 08	2008	1	2	02
3/01/2008 12:00:00 AM	2008	Jan 08	2008	1	3	03

Data Management Architecture

Overview	Data Sources	Data Integration	**Data Mart**	Platform

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Calendars – Data Integration

→ Data integration tasks associated with Business Calendars are performed during initialisation of the customer environment with Metricus

→ Consultants can create the business calendar in Excel and as part of the Metricus Hosting Services, the appropriate table structures will be created and the data loaded.

→ Maintenance of the business calendars for a customer is also included as part of the Metricus Hosting Services.

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IT Entity – Overview

→ In database terms, an entity is a distinguishable object represented by a table. An entity has attributes which describe unique features associated with the entity. These are the columns of the table

→ Examples of entities within IT include Service Requests, Incidents, Changes, Projects, Risks, Resources, Surveys, etc

→ IT Entities provide data for the calculation of metrics as well as supporting information for analyse of metric performance

→ Many IT Entities have associated history data e.g. Incident Workgroup History, Change Implementation Tasks.   Wherever, possible, this data should be aggregated and normalised into a the parent entity table.

Changes	**Service Requests**	**Configuration Items**	**Service Levels**	**Work Orders**

Data Management Architecture

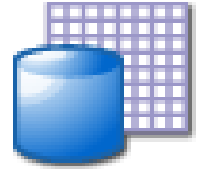| Overview | Data Sources | Data Integration | **Data Mart** | Platform |

IT Entity – Tables

The Metricus IT Performance Datamart provides a set of standard IT Entity tables.

Example: Changes

Overview

Calendars

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Column Name	Data Type	Allow Nulls
[Change ID]	int	☐
[Create Time]	datetime	☑
[Implementation Time]	datetime	☑
[Create to Implement Duration]	decimal(10, 2)	☑
[Implement Met]	tinyint	☑
Priority	varchar(20)	☑
Classification	varchar(20)	☑
[Requiring Scheduled Outage]	tinyint	☑
[Failure due to CMDB Issues]	tinyint	☑
[Causing Incidents]	tinyint	☑
[Implemented without Back-out Plan]	tinyint	☑
[Implemented without CI Update]	tinyint	☑
[Implemented without Testing]	tinyint	☑
Failed	tinyint	☑
Rejected	tinyint	☑
Risk	varchar(50)	☑
[Incorrect Data]	tinyint	☑
Status	varchar(50)	☑
Signoff	tinyint	☑

Change ID	Create Time	Implementation Time	Create to Imple...	Implement Met	Priority	Classification
1	21/08/2007 5:05:35 AM	18/01/2007 12:33:22 AM	11921.00	0	None	Routine
2	17/01/2007 4:00:58 PM	18/01/2007 12:33:22 AM	30744.00	1	Low	Routine
3	22/08/2007 1:03:26 PM	24/08/2007 5:44:53 AM	146487.00	1	Low	Routine
4	19/06/2007 8:20:49 PM	21/06/2007 2:03:03 PM	150134.00	1	Low	Routine

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IT Entity – Data Integration

→ IT Entity data is populated by either file transfer and load or direct extraction from underlying operational data sources

→ Examples of common transformations applied include normalisation, re-mapping and aggregation

→ The Metricus IT Performance Data Mart provides templates for data integration tasks associated with population of standard IT Entity tables

→ The Metricus IT Performance Metrics Metadata is populated based on the standard IT Entities in the Metricus IT Performance Datamart

→ Metricus Consulting Services assist in the setup of data integration tasks required to populate IT Entity

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Metrics – Overview

→ Metricus provides dedicated tables within the IT Performance Datamart to store the specific attributes of a metric and the metric history

→ Metric tables provide the data for the population of scorecards and dashboards.

→ Attributes include descriptions, actuals, thresholds, targets, status, scores and pattern information

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Metrics – Tables

Metrics

Column Name	Data Type
🔑 Metric	nvarchar(100)
[Format String]	nvarchar(10)
Pattern	nvarchar(12)
[Data Integration]	nvarchar(50)
Target	float
Benchmark	float
[Target Tolerance]	float
[Benchmark Tolerance]	float
Aggregation	tinyint

Metric Values

Column Name	Data Type
🔑 Metric	nvarchar(100)
🔑 Date	smalldatetime
[Actual - N]	decimal(19, 5)
[Actual - D]	decimal(19, 5)
Target	decimal(19, 5)
[Target Tolerance]	decimal(19, 5)
[Target Score - Status]	decimal(6, 2)
[Target Score - Trend]	decimal(6, 2)
[Target Status]	smallint
[Target Trend]	decimal(6, 2)
Benchmark	decimal(19, 5)
[Benchmark Tolerance]	decimal(19, 5)
[Benchmark Score - Status]	decimal(6, 2)
[Benchmark Score - Trend]	decimal(6, 2)
[Benchmark Status]	smallint
[Benchmark Trend]	decimal(6, 2)
Aggregation	tinyint
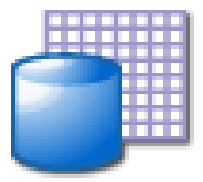
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Metrics – Data Integration

→ Data in the Metrics table is manually entered as part of the setup of metrics for a customer

→ The Metric Values table can be populated via:

1. Manual data entry

2. File transfer of metric values

3. Direct from operational data – either via file transfer or source connection

→ The Metricus IT Performance Datamart contains template data integration tasks for the different data population options

→ Procedures for calculating metric scores and trends are included in the Metricus IT Performance Datamart.

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Staging – Overview

→ Staging tables with the Metricus IT Performance Datamart represent data structures for the loading of data directly from source data structures (via file transfer or direct connection)

→ They are intermediary tables used to transform data before loading into the IT Entity tables or Metric tables.

→ The structure of staging tables is dynamic and often corresponds to structures within the underlying data source

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Staging – Tables

Sample staging table: <u>DS_Performance</u>
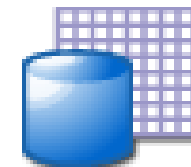
	Column Name	Data Type
🔑	[Application ID]	tinyint
🔑	Timestamp	smalldatetime
	Hour	char(2)
	[Available - Connect]	tinyint
	[Available - Login]	tinyint
	[Available - Add item]	tinyint
	[DNS Setup Time - Connect]	decimal(10, 4)
	[Server Response Time - Connect]	decimal(10, 4)
	[Transfer Time - Connect]	decimal(10, 4)
	[Connect Time - Connect]	decimal(10, 4)
	[DNS Setup Time - Login]	decimal(10, 4)
	[Server Response Time - Login]	decimal(10, 4)
	[Transfer Time - Login]	decimal(10, 4)
	[Connect Time - Login]	decimal(10, 4)
	[DNS Setup Time - Add item]	decimal(10, 4)
	[Server Response Time - Add item]	decimal(10, 4)
	[Transfer Time - Add item]	decimal(10, 4)
	[Connect Time - Add item]	decimal(10, 4)
	Available	tinyint

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Staging – Data Integration

→ Staging tables are populated via file transfer or directly from the operational data source

→ Depending on the nature of the underlying data, extensive transformations may be required to normalise the data into ITE data structures.

→ Creation of data integration tasks associated with staging tables are offered as part of Metricus Consulting Services

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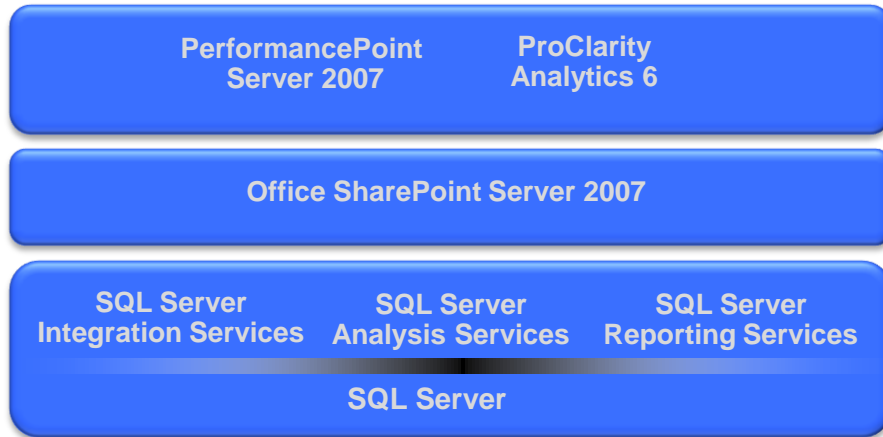
IT Entity

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→ The Metricus IT Performance Data Mart leverages OLAP functionality to store

- Metric actuals, targets and benchmarks

- Supporting data for metrics related to IT Entities

→ The OLAP data structures are inherited from the relational data structures. In this sense, OLAP is simply a different data storage mechanism geared at rapid data retrival and ad-hoc analysis

→ Each customer setup in Metricus has a dedicated, secure OLAP database linked to, and sourcing data from the corresponding customer relational database

→ No data transformation or calculations are performed when storing data in OLAP. This is done during the data integration to relational data structures
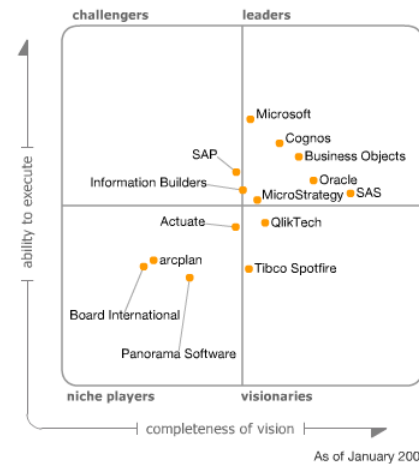
Data Management Architecture

Overview	Data Sources	Data Integration	Data Mart	**Platform**

Metricus **IT Performance Business Intelligence**

→ The Platform component of Metricus is called Metricus Business Intelligence (BI)

→ Metricus BI is built using the leading BI environment – the Microsoft Business Intelligence Framework.

→ www.metricus.com/bi

Gartner - BI Magic Quadrant - January 2008

PerformancePoint Server 2007   **ProClarity Analytics 6**

Office SharePoint Server 2007

SQL Server Integration Services   **SQL Server Analysis Services**   **SQL Server Reporting Services**

SQL Server

challengers | leaders

ability to execute

- Microsoft
- Cognos
- SAP — Business Objects
- Information Builders — Oracle
- MicroStrategy • SAS
- Actuate — QlikTech
- arcplan — Tibco Spotfire
- Board International
- Panorama Software

niche players | visionaries

completeness of vision

As of January 2008

Founded in 2001, NAI is a leading provider of consulting, training, benchmarking and solutions in the areas of IT management and control best practices utilizing globally accepted standards and frameworks such as ISO 20000, ITIL, eSCM, PMBOK, CMMI and COBIT.

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