

Scenarios for Message and Event Monitoring; Implementation & Demonstration



Agenda

- **Introduction**
 - **Ian Atkinson; IT Architect working with BPM and BAM solutions**
 - **Overview of the monitoring implementation**
- Equities Allocation Scenario
 - Implementation
 - Dashboards
- Collateral Management Scenario
 - Implementation
 - Dashboards

Introducing Business Activity Monitoring

- Ensuring optimal operational performance requires timely, actionable information on the state of business processes.
- This information is typically difficult to obtain since it is distributed across multiple disparate systems that were never designed to be integrated.
- Business Activity Monitoring combines process events, external system events and supporting context data to generate KPIs in a targeted, timely, actionable form.
 - Which leads to higher productivity, better customer service, better decision-making and cost reduction.

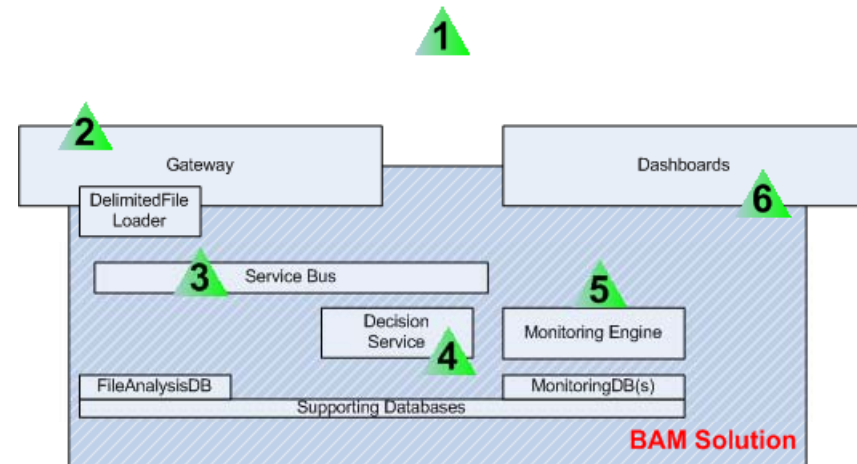


Define the key business information to be monitored

- What information do we need to achieve real-time visibility into processes?
 - How are we performing
 - Where are the bottle-necks
 - What actions need to be taken
 - What do the business users need
 - Key Performance Indicators
- Where is the source of this data?
 - How will it be provided to BAM
 - Does it require transformation
 - Does it require consolidation or rationalization
 - Data Correlation
- How do we need to analyse the data?
 - Do we need additional configuration information
 - Do we need rules to derived additional information
 - What groupings are required for dimensional analysis and reporting.
- **The answers drives the design of the solution components**

Information identification impact on solution components

- **User and management guides (1)**
 - Identifies the external systems that will be monitored and their data output characteristics.
- **Gateway and service bus (2,3)**
 - Identifies the required transports and raw data formats into the BAM platform
 - Enables definition of internal data format
 - Finalise requirements to prioritise, reformat and convert data to internal format
 - Defines routing and correlation requirements based on source.
- **Decision service (4)**
 - Aids definition of the requirement for configuration information for the BAM projects: examples routing, transforms, and file formats
 - Information identified will be the source and output for business rules to be applied to events as they enter the BAM environment, for example prioritisation, service levels, and thresholds
- **Monitoring engine (5)**
 - Monitor models are designed to capture, aggregate and analyse the required information.
 - Monitor models provide the process context structure around the identified data.
- **Dashboards (6)**
 - Visualisation of the identified data in the format required, including Process Diagrams, KPI gauges, Instance Tables, Dimensional graphs and charts
 - Configurable widgets visualise the information in many different forms.



Software

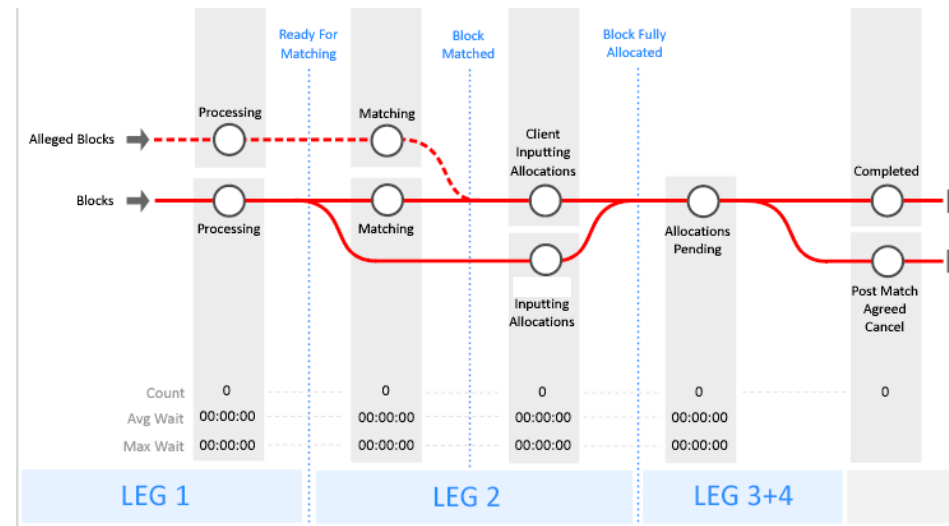
1. External systems
2. Message broker
3. Message broker
4. WebSphere iLog jRules
5. WebSphere Business Monitor
6. WebSphere business space

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Scenarios: Business process monitoring

- Pensions buy millions of equities at a time
 - A purchase of 1m IBM shares on the market requires a seller
 - A purchase of large volumes affects price
- Banks mediate these sales
 - They take an order for 1m shares and place 500,000 buy instructions for 2 shares each.
 - Reduces market affects, obscures trading behaviour, and makes it more likely to find sellers
- Once purchased shares and fees must be allocated to pension funds and trading accounts
 - Trading blocks are processed in a number of stages/leg
 - Each block is matched to equities and allocated before reaching a pending status
 - Allocations are approved and the trade is completed
 - Some trade allocations are processed quickly; others require intervention and longer to process
- External bodies rate banks on their efficiency
 - Late settlement costs money
 - Manual steps in the process

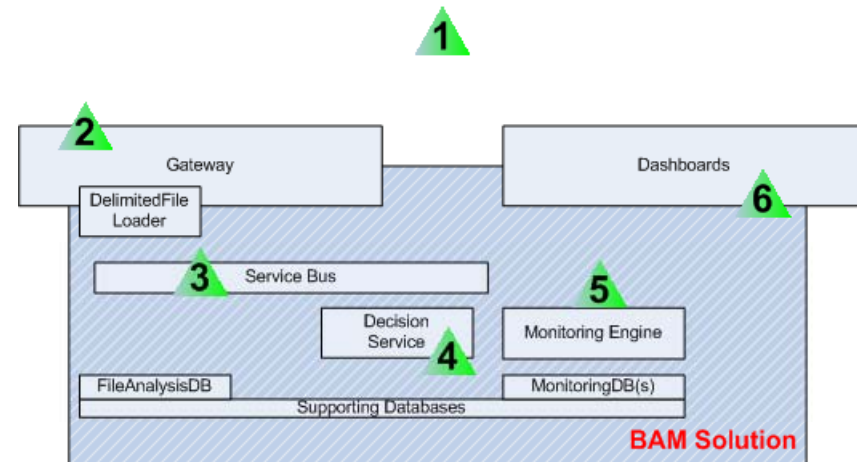


Scenario takes data from many systems and presents it as a railway.

- Trades progress
- Exceptions are highlighted
- Metrics are calculated

Equities Allocation solution components

- **User and management guides (1)**
 - Agreement to subscribe to existing Equities Allocations external events
- **Gateway and service bus (2,3)**
 - Filtering of redundant external events
 - Integration to priority service provided by decision service
 - Convert data to internal format
- **Decision service (4)**
 - Priority service that ranks trade blocks based on source data
- **Monitoring engine (5)**
 - Equities Allocation monitor model that tracks prioritised trade blocks through the allocation process.
 - Provides multi-dimensional representation of the monitored data
 - Time Profile monitor model provides inter day progress trends
- **Dashboards (6)**
 - Executive dashboard with progress KPIs
 - Identification of “stuck” trade blocks
 - Visual representation of Equities Allocation process aggregated by all trades, by customers or for individual trades
 - Dimensional tables and charts for graphical analysis



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Current Trade Block Activity

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BAM4EA Equities Allocations Release 1

Block By Activity (+ Detail) | Executive Dashboard | Client Instances | Activity Time Profile | Individual Trades | Aggregate Trades | Block Activity Graphs | Block Activity Graphs | New Page | Add Widgets

Current Block Activity (+ Detail)

- 01 Blocks Processing
- 02 Blocks Matching
- 03 Blocks Client Inputting Allocations
- 05 Blocks Pending Allocations
- 06 Blocks Completed
- 07 Blocks Post Matched Agreed Cancelled
- 08 Blocks Cancelled
- Outstanding Blocks

Trade Blocks Counts

State Blocks (+ Detail)

Priority Level	All Priority Level	Block Station	All Block Station	Sales Location	LN
Day - Hour - Minutes - Seconds	Client Name	Outstanding Blocks	Block Priority Average	Block Priority Min	
All Day - Hour - Minutes - Seconds	All Client Name	30	2	0	
19	All Client Name	2	2	0	
20	All Client Name	5	5	0	

Outstanding Blocks With indication of when last updated

Detail

Export... Search for: [] Reset

Priority	Currency	Block Reference	WaitTotal	Current Block Station
0	EUR	TESSTESSBlockTQ109461B11	36 d, 11 h, 30 m, 28 s	Allocations Pending
0	EUR	TESSTESSBlockTQ109461B51	36 d, 11 h, 30 m, 29 s	Allocations Pending
0	EUR	TESSTESSBlockTQ109461B61	36 d, 11 h, 30 m, 31 s	Allocations Pending
0	EUR	TESSTESSBlockTQ109461B41	36 d, 11 h, 30 m, 34 s	Allocations Pending
0	NOK	TESSTESSBlockTQ109461B21	36 d, 11 h, 30 m, 35 s	Allocations Pending
0	DKK	TESSTESSBlockTQ109461B31	36 d, 11 h, 30 m, 36 s	Allocations Pending
0	EUR	TESSTESSBlockTQ109461A21	36 d, 11 h, 30 m, 40 s	Allocations Pending
0	USD	TESSTESSBlockTQ1093CDBA1	36 d, 1 h, 3 m, 56 s	Allocations Pending
1	EUR	TESSTESSBlockTQ109461B71	36 d, 11 h, 30 m, 29 s	Allocations Pending
1	EUR	TESSTESSBlockTQ109461B01	36 d, 11 h, 30 m, 32 s	Allocations Pending
1	EUR	TESSTESSBlockTQ109461BA1	36 d, 11 h, 30 m, 33 s	Allocations Pending
1	EUR	TESSTESSBlockTQ109461B81	36 d, 11 h, 30 m, 39 s	Allocations Pending
5	USD	TESSTESSBlockTQ10947A851	36 d, 10 h, 59 m, 50 s	Allocations Pending
5	USD	TESSTESSBlockTQ10947A3C1	36 d, 11 h, 0 m, 23 s	Allocations Pending
5	USD	TESSTESSBlockTQ10941C1F1	36 d, 14 h, 32 m, 8 s	Allocations Pending
10	IDR	TESSTESSBlockTQ10930DCB1	30 d, 10 h, 10 m, 10 s	Allocations Pending

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Trade Blocks Details

Trade Block KPIs

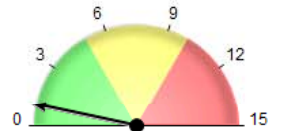
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BAM4EA Equities Allocations Release 1

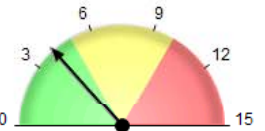
Block By Activity (+ Detail) | **Executive Dashboard** | Client Instances | Activity Time Profile | Individual Trades | Aggregate Trades | Block Activity Graphs | Block Activity Graphs | New Page

Current Blocks Per State

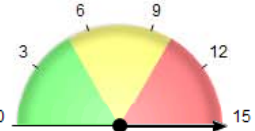
01 Blocks Processing



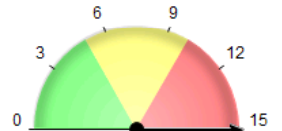
02 Blocks Matching



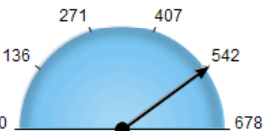
03 Blocks Client Inputting Allocations



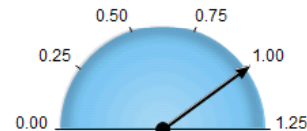
05 Blocks Pending Allocations



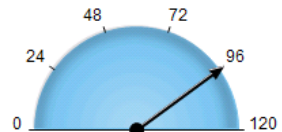
06 Blocks Completed



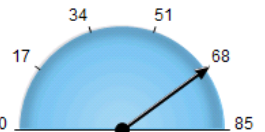
07 Blocks Post Matched Agreed Cancelled



08 Blocks Cancelled

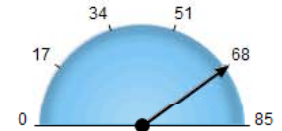


Outstanding Blocks

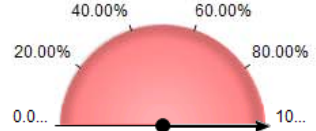


Outstanding Blocks & Priority

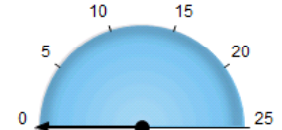
Outstanding Blocks High Priority



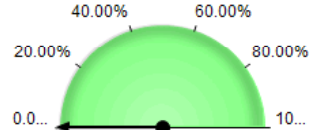
Outstanding Blocks High Priority %



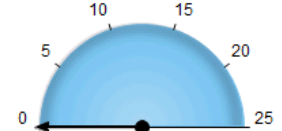
Outstanding Blocks Low Priority



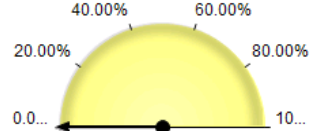
Outstanding Blocks Low Priority %



Outstanding Blocks Medium Priority



Outstanding Blocks Medium Priority %



Trade Block metrics aggregated per client

Summary detail for clients with link to visual representation

Client Name	SLA 1hr	Longest in-progress wait	Blocks
Client4	!	36 d, 0 h, 25 m, 57.014 s	↕
Client5	!	36 d, 0 h, 32 m, 33.633 s	↕
Client1	!	36 d, 0 h, 38 m, 59.199 s	↕
Client2	!	36 d, 13 h, 49 m, 4.17 s	↕
Client3	!	36 d, 16 h, 10 m, 5.912 s	↕

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Gold Clients

Client Name	SLA 1hr	Longest in-progress wait	Blocks
Client6	!	36 d, 1 h, 29 m, 53.591 s	↕
Client7	!	36 d, 0 h, 27 m, 49.045 s	↕
Client9	✓	0 s	↕
Client8	✓	0 s	↕

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Drill down to Trade Block details

Train track representation of Equities Allocation process showing aggregated counts and times for Client5

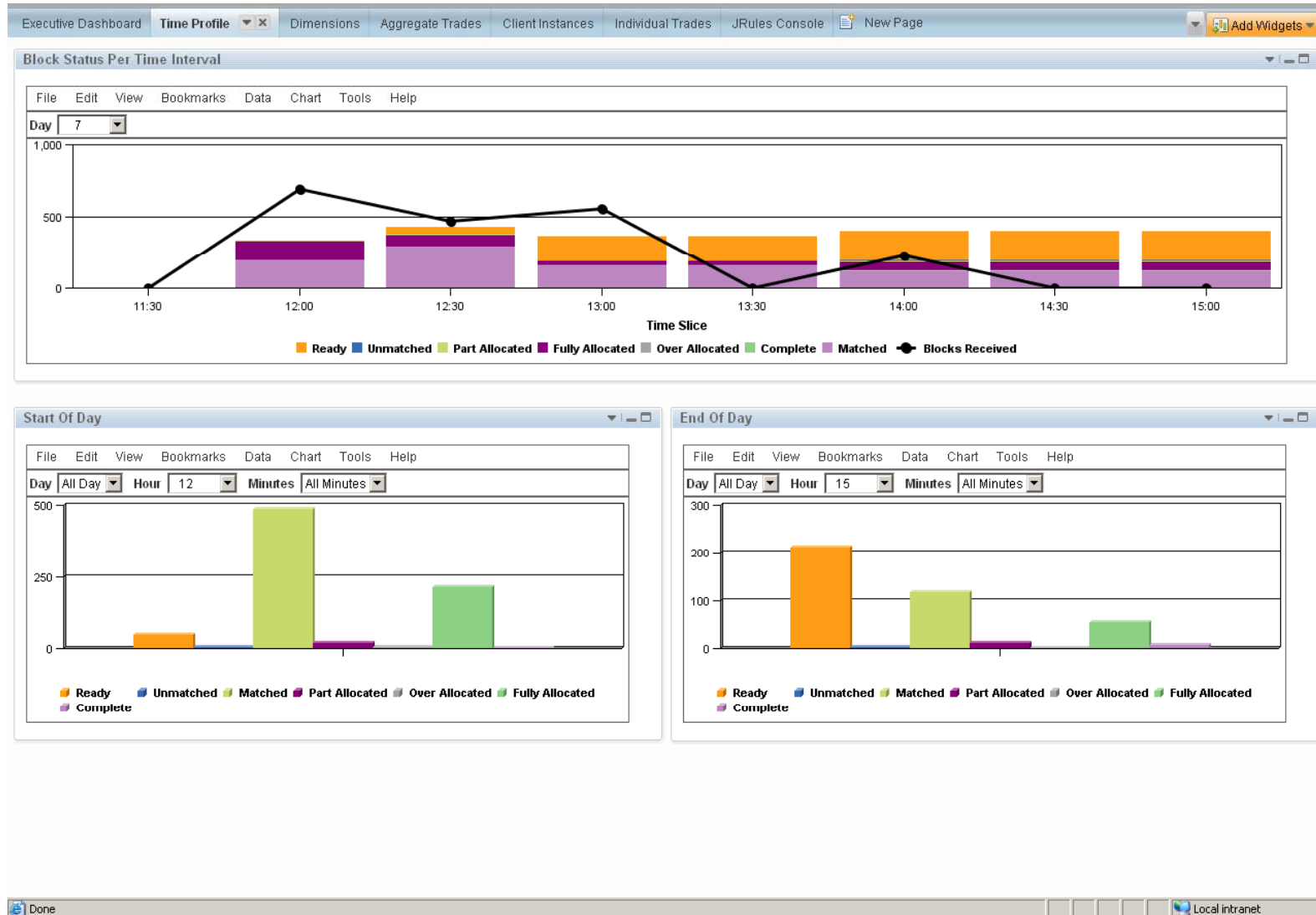
BLOCK FLOW

Count	0	0	-9	Count	10
Avg Wait	00:00:00	00:00:00	0.161 s	Min E-2-E	100 d, 0 h, 0 m, 0 s
Max Wait	00:00:00	00:00:00	00:00:00	Avg E-2-E	0 s
				Max E-2-E	0 s

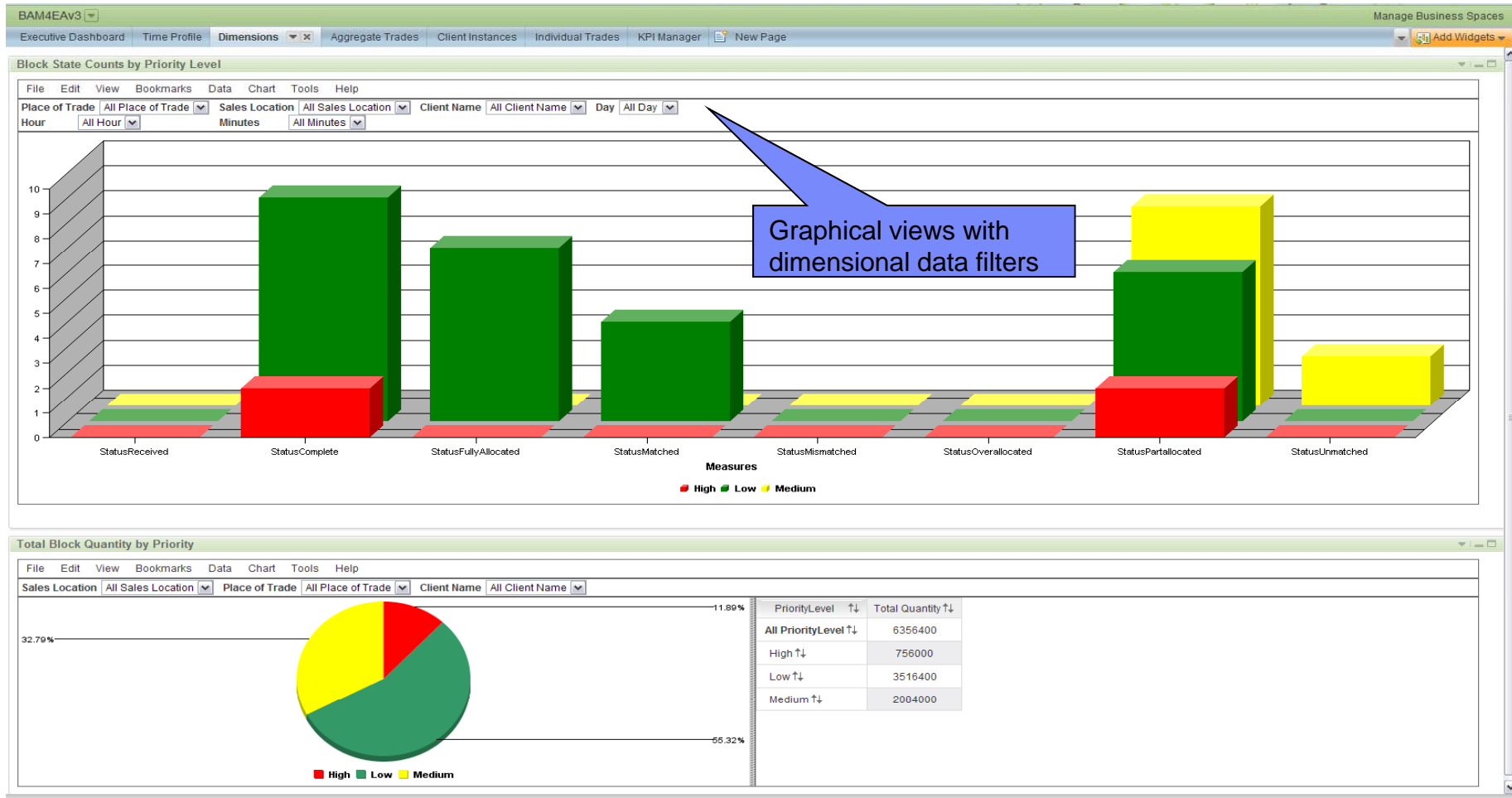
Stages: Processing, Matching, Client Inputting Allocations, Allocations Pending, Completed

LEG 1 | LEG 2 | LEG 3+4

Daily Trends



Dimensional Analysis



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The Problem – OTC Derivatives Counterparty Risk Management

- Two parties enter into a contract, which may not expire for years.
- The value of that contract changes over time
- At any time, one party will be “in the money” and the other will be carrying a loss
- **Question:** *what happens if the “loser” goes bust before the contract expires?*
- **Answer:** *the winner could be sitting on a profit that they can't realise. Ouch!*



Collateral Management

- The **Collateral Management Process** is a solution to this problem of credit risk
- At regular intervals, a bank will calculate its net position with respect to each of its counterparties
- This position is agreed with each counterparty
- The party with the negative position delivers **collateral** to the other
- A bank can use this collateral as repayment in the event that a counterparty defaults



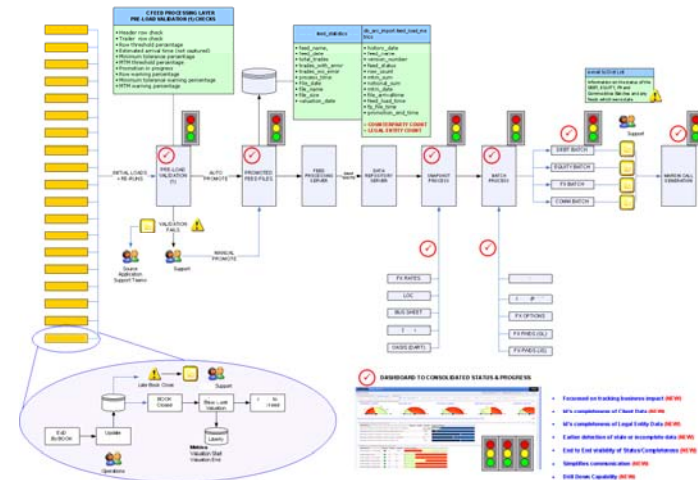
There's a "but" coming...

"At regular intervals, a bank will calculate its position with respect to each of its counterparties"

- The process cuts across every geography, time-zone, trading system...
 - We need up to date valuations from every source system
 - What exchange rates should be used?
 - Which clients have collateral agreements?
 - For which classes of instrument?
 - On which days?
 - Which office should the call be made from?
 - What if we can't agree on a valuation?

- Typical solutions are a complex combination of manual and automatic processing with batch, flat files and event feeds that arrive unreliably and unpredictably

- *And if a bank had not been holding the correct amount of collateral on the day Lehman Brothers failed, they could have been seriously exposed.*



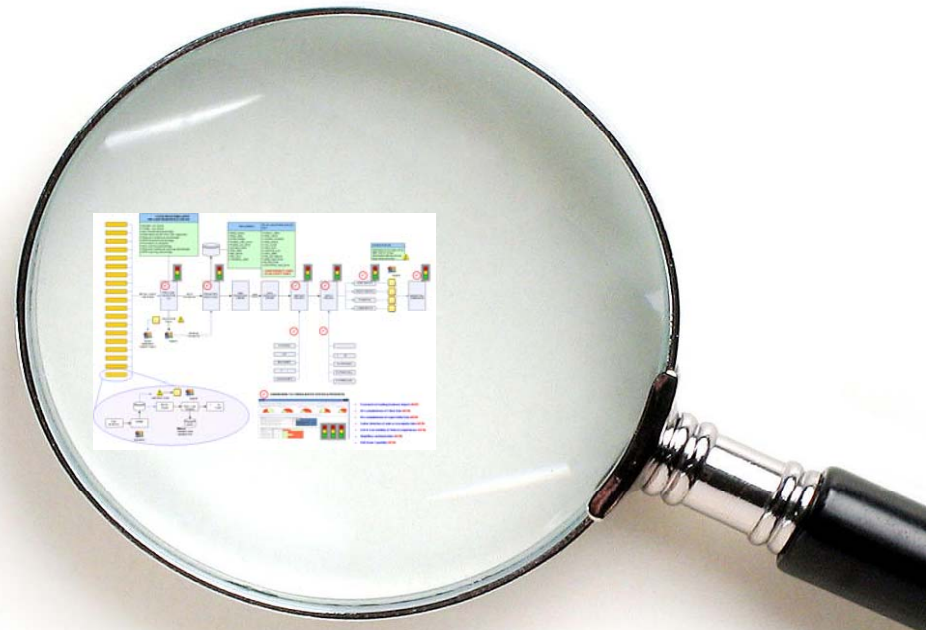
Applying BAM to the Collateral Problem...

Fixing the process is hard but if we could **see** what was happening, we'd be half way there

- **Provide high-level overview of progress**
 - How are we progressing? Where are the bottlenecks?
 - *Benefit:* build confidence that process is on track, highlight problems early, capture data to support subsequent re-engineering projects

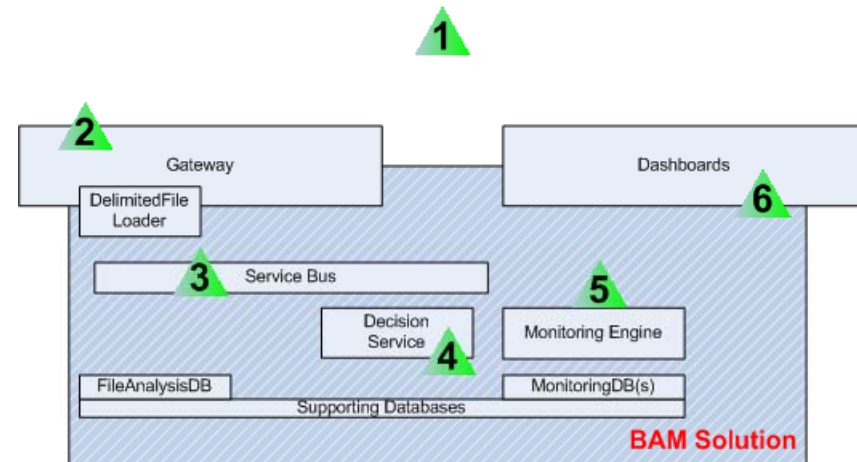
- **Identify missing or incorrect feeds**
 - Predict impact of stale, missing or erroneous data on bank's ability to issue accurate calls... while there is still time to rescue the situation
 - *Benefit:* increased productivity, fewer incorrect calls

- **Identify when calls are ready to be made**
 - Reconcile at a trade level to detect when a call is ready
 - *Benefit:* increased accuracy, more timely issuance of collateral calls



Collateral Management solution components

- **User and management guides (1)**
 - Agreement to be supplied copies of existing file based inputs and outputs from external systems on a daily basis.
- **Gateway and service bus (2,3)**
 - File loader to handle different source file types
 - Summary metric service that consolidates input data into a defined “tracking group” hierarchy.
 - 90 % compression of input data.
 - Convert data to internal format
 - Provide threshold service
- **Decision service (4)**
 - Configuration data for metric summary service and data loading
 - Threshold data used for ETA and SLA reporting on a per source basis in BAM
- **Monitoring engine (5)**
 - Collateral Management monitor model that tracks trade and deal information within a specific “tracking group” hierarchy.
 - Provides multi-dimensional representation of the monitored data
- **Dashboards (6)**
 - Early warning of missing file feeds
 - Warning of large swings in current collateral run versus previous run
 - Drill-down analysis at all levels of the “tracking group”
 - Dimensional tables and charts.
 - Quality and Schedule SLAs, MtM and Trade Count Variances



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Dashboards provide early warning of problems

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Trades Hierarchical Drill Down View | Deals Hierarchical Drill Down View | Graphical View By Tracking Group | Graphical View By Dimension

Drill Down Daily Trade Runs

Export ... Search for: [] Reset

Last Update	Run ID	Source	T -1 Total	Total	Source (% Comp)	Feed (% Comp)	Count Check	MTM Check
	25	☹	39,871	0	0	0	🔴	🔴
28 June 2010 13:31:59	24	☹	39,871	39,871	100	100	🟡	🟢
28 June 2010 12:36:16	23	☹	40,063	39,871	100	100	🟡	🟢
28 June 2010 11:56:13	22	☹	0	40,063	0	0	🔴	🔴

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Traffic light indication of source and feed arrival and data consistency with previous run

Warnings at a per source level

base 1

Deals Hierarchical Drill Down View | Graphical View By Tracking Group | Graphical View By Dimension

Drill down to warning at all levels of the tracking group

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Trades Hierarchical Drill Down View | Deals Hierarchical Drill Down View | Graphical View By Tracking Group | Graphical View By Dimension

Drill Down Daily Trade Runs

Export ... Search for: [] Reset

Source	Feed	Product	Legal Entity	Book	Counter Party	Count Check	MTM Check	Stale MTM	MTM Of Zero
Source9	Feed6	BOND TRANSFER	Source2	RPOIC1	☹	🟢	🟢	58	0
Source9	Feed6	BOND TRANSFER	Source2	PFPEXF	☹	🟢	🟢	6	0
Source9	Feed6	BOND TRANSFER	Source2	PLGEX7	☹	🟢	🟢	4	0
Source9	Feed6	BOND TRANSFER	Source2	RPOIB3	☹	🟢	🟢	21	0
Source9	Feed6	BOND TRANSFER	Source2	PLTEX2	☹	🟢	🟢	196	0
Source9	Feed6	BOND TRANSFER	Source2	PFPEXN	☹	🟢	🟢	18	0
Source9	Feed6	BOND TRANSFER	Source2	PLTEX3	☹	🟢	🟢	249	0
Source9	Feed6	BOND TRANSFER	Source2	PFPEXC	☹	🟢	🟢	58	0
Source9	Feed6	BOND TRANSFER	Source2	RVAEX4	☹	🟢	🟢	171	0
Source9	Feed6	BOND TRANSFER	Source2	RPOIC3	☹	🟢	🟢	320	0

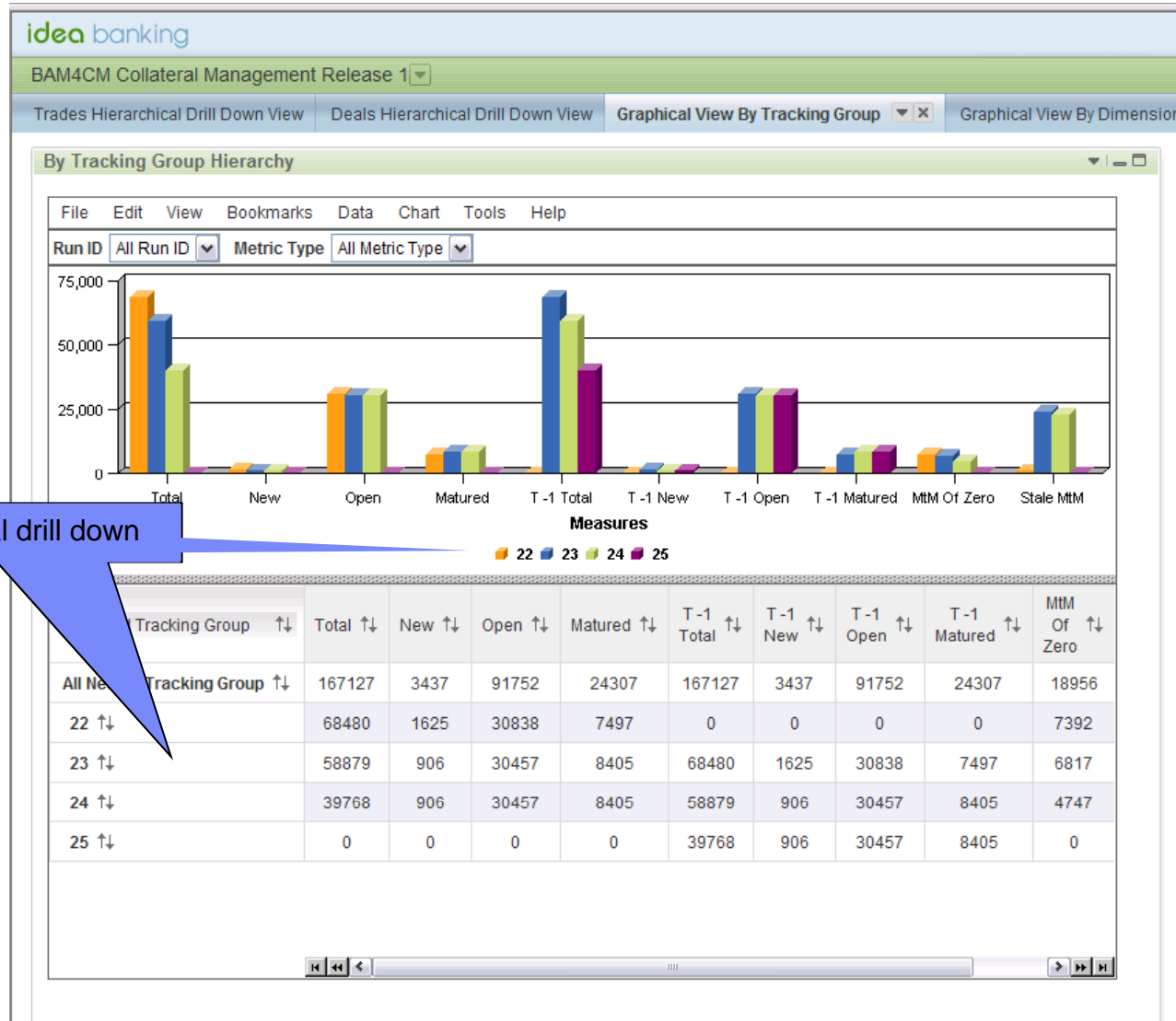
Export ... Search for: [] Reset

Source	Feed	Total	SLA Status	Feed (% Comp)	Count Check	MTM Check	MTM Of Zero	Stale MTM
Source12	☹	338	Complete	100	🟡	🟢	18	0
Source11	☹	290	Complete	100	🔴	🟢	0	0
Source10	☹	1,658	Complete	100	🔴	🔴	615	0
Source9	☹	14,744	Complete	100	🟡	🟢	2,708	14,744
Source8	☹	6,387	Complete	100	🟡	🟡	108	0
Source7	☹	6	Complete	100	🔴	🔴	0	0
Source6	☹	4,871	Complete	100	🟡	🟢	49	0
Source5	☹	3,044	Complete	100	🟡	🔴	8	0
Source4	☹	11	Complete	100	🔴	🔴	0	5
Source3	☹	199	Complete	100	🟡	🔴	15	44
Source2	☹	8,202	Complete	100	🟡	🟢	1,197	8,202
Source1	☹	121	Complete	100	🟢	🟢	29	0

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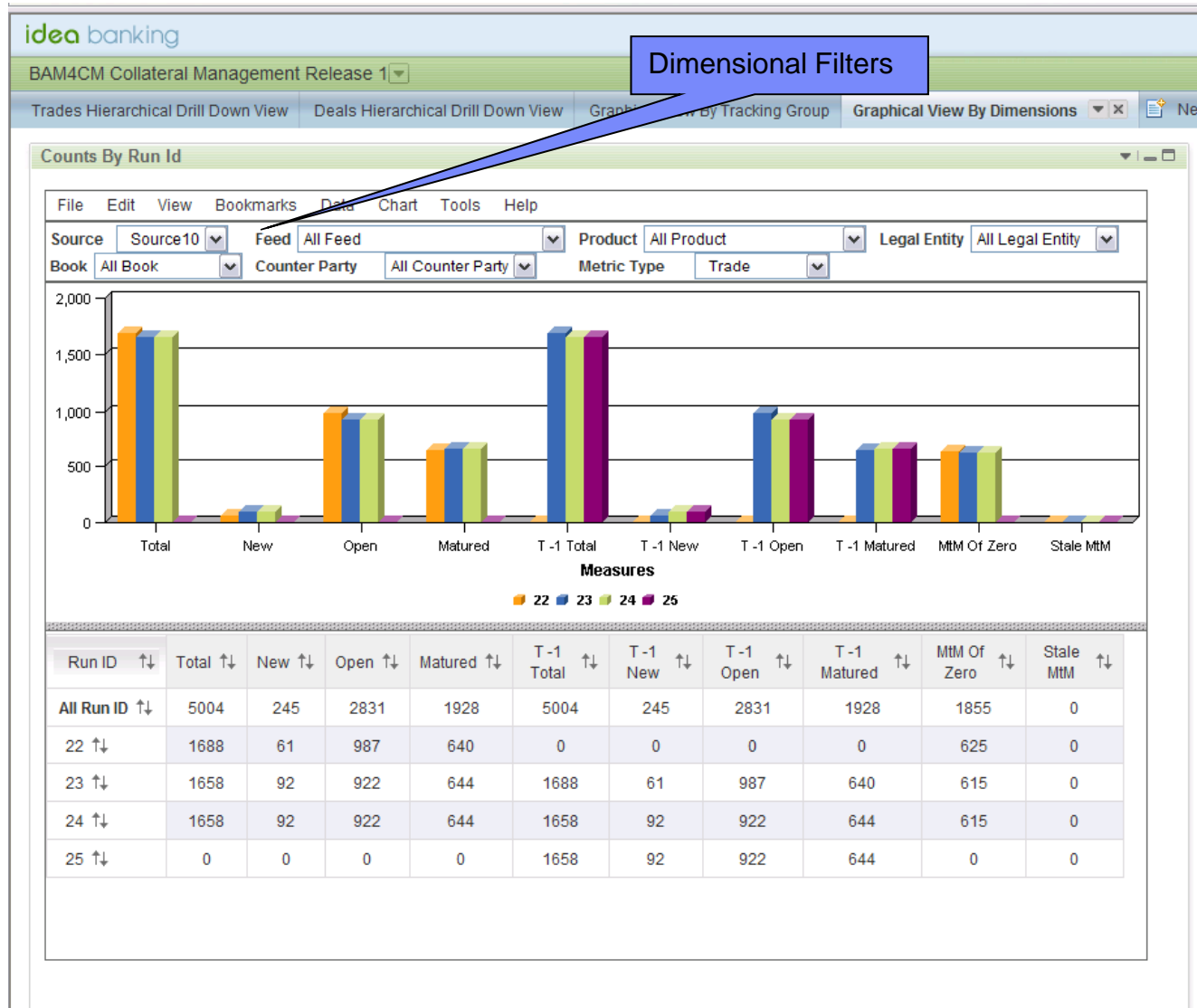
Drill Up

Graphical representation with dimensional drill downs



Run id Dimensional drill down

Graphical representation with dimensional filters



Current Position

- Both solutions currently in pilot at bank
- Business users already seeing benefits and suggesting additions to dashboards
- Equity Allocations priority rules already changed to increase benefit.
- Proposal to add priority service into source systems
- Collateral Management dashboards highlighted a potential problem on second day
- Helped to identify the source of problem before completion of the Collateral run.