



# BUSINESS ACTIVITY MONITORING | BAM

HOW BUSINESS ACTIVITY MONITORING CAN IMPROVE AGILITY  
AND EFFECTIVENESS OF NEXT-GENERATION PAYMENTS BUSINESS

– Abhisek Bhowmik, Siddhant Anthony Johannes

**A few years ago, one of the top Australian banks had outages in its legacy payments system, causing several missed deadlines. The impact was severe – customer dissatisfaction, bad press, fines, legal claims, and of course losing leadership position in the ever-competitive banking business. The bank took days to identify the root cause and correct the problem. In an increasingly connected financial world, any such delay can cause systemic risk in the payments network and prove catastrophic for the bank's reputation.**

Last year, in one of the largest coordinated security breach incidents in modern history, US\$40 million was fraudulently cashed out from ATMs across the world in a matter of hours. Prepaid and debit card information was compromised, withdrawal limits and balances were increased, the numbers were skimmed onto dummy cards, and cashing crews around the globe (27 countries and about 4500 ATMs) started withdrawing money before banks, or card and ATM networks could recognize the heist.

These two incidents are not exceptional. With the ever-increasing connectivity and sophistication of IT systems, such incidents, where real-time business intelligence (BI) is not available for taking proactive measures, are increasing. To survive in a low margin (SEPA), low float (faster mass payments) environment, payments organizations are increasingly becoming dependent on automation and straight-through processing (STP) using payments service hubs (PSH). With increased dependence



on IT, any system outage or process gap can increase operational risks. Hence in the ultra-competitive payments business, where banks and payments service providers need to monitor cost, time, risk, and regulatory compliance, all at the same time, real-time intelligence is becoming a key strategic advantage.

Most banks and financial institutions have appreciated the advantage of data-driven decision-making for a long time. In the last decade or so, corporations have invested huge resources in data warehouse (DW), data mart, and BI solutions – reaping the benefits of clarity in decision-making by making use of historical trends. We have also seen investments in business process management (BPM) systems where rules-driven workflows have improved operation efficiency. Unfortunately, many of these

systems did not have the capability to provide real-time BI; they were ex-post in nature which proved to be limited in today's agile business environment, where timely decision-making is extremely critical.

To fill this gap, next-generation business solutions are getting a lot of traction among forward-thinking organizations. They come in various avatars – business activity monitoring (BAM), complex events processing (CEP), or real-time business intelligence (RT BI). These solutions proactively watch events and key metrics in near real-time, perform correlation analysis of large data to identify patterns and causal relationships, generate alerts, and provide a control-room-like heatmap / dashboard view to the management for timely decision-making.

## Evolution maturity of BAM solutions

Early BAM usage was targeted at understanding business flows through IT systems. This entailed tracking processes, events, and transactions, and displaying the information through dashboards or reports. But as BAM advanced, the focus shifted from this relatively static view to a more dynamic one. The high levels of statistical and analytical intelligence provided the ability to understand business dynamics accurately and therefore brought a closer focus on addressing real business issues.

### Features of BAM

BAM supports the observe-orient-decide-act negative feedback control system philosophy. When choosing a BAM solution, maturity of the following features should be considered:

- Supports key process indicators (KPI) definition and near-real-time tracking of volumes (number of transactions, number of process events, number of changes in a record), velocities (cycle time, wait times between events,

|         |                    |
|---------|--------------------|
| Volumes | Velocities         |
| Errors  | Special conditions |

process throughput), errors (system errors, process flaws) and special conditions (as defined by user) from various internal and external events sources.

- Not tightly coupled to a BPM solution and behaves as an external observer entity.
- Context aware – effective filter to reduce noise and wasteful computation.
- Right metrics and right level of alerts.
- Predictive analytics and systematic drill-down capabilities to recognize the root causes of a problem and minimize risk of process gaps.
- Should support a broad spectrum of data formats, data sources, and connection and collection options.

### What

- The use of technology to identify critical opportunities and risks in an enterprise.

### Why

- To maximize profitability and optimize efficiency.

### How

- Gather data, effectively and promptly
- Categorize and identify data points which will highlight specific concern areas
- Define high-level business needs and critical areas to create data filters
- The out-of-box product should support matured BAM features and also provide easy customization options as per business needs. The solution should not have a dependency on a specific platform / technology.

## Leading vendors

| Pure-play BAM   | Application integration middleware  | Mega-vendors  | Open source  | Payments niche   |
|---|---|---|--|--|
| <ul style="list-style-type: none"> <li>• Systar BusinessBridge (now acquired by Axway)</li> </ul> | <ul style="list-style-type: none"> <li>• Axway 5 Suite</li> <li>• TIBCO BusinessEvents®</li> <li>• Software AG's Apama Analytics &amp; Decisions</li> </ul> | <ul style="list-style-type: none"> <li>• Microsoft BizTalk – BAM module</li> <li>• Oracle Business Activity Monitoring (Oracle BAM)</li> <li>• IBM® Cognos® Real-time Monitoring</li> </ul> | <ul style="list-style-type: none"> <li>• Apache Camel BAM</li> </ul> | <ul style="list-style-type: none"> <li>• Fiserv CheckFree PaymentView™</li> <li>• Incentage IPC</li> </ul> |

## Solution fitment and implementation options

One of the key questions in a CIO's mind after the value decision has been made would be BAM solution fitment in the existing enterprise architecture which has evolved over years. There will be considerations of cost, product maturity, and flexibility of customization. While there is no one-size-fits-all solution, the following are some implementation approaches:

- **Pure-play BAM implementation:** Enterprise-wide implementation of BAM solution as a separate observation,

learn, decide, and act play. This can be done in phases and integrated with various related systems over time.

- **BAM solution packaged with PSH solution:** Leading BAM vendors have partnerships with PSH vendors such as FUNDTech and C2P, and offer customized BAM solutions specifically targeted towards various types of payments processing.
- **BAM as an extension of an existing BPM suite of solutions:** Many BPM vendors have modules for BAM, which can be licensed at an additional price. This is suitable if the business prefers

continuity in BPM infrastructure investments with incremental BAM benefits.

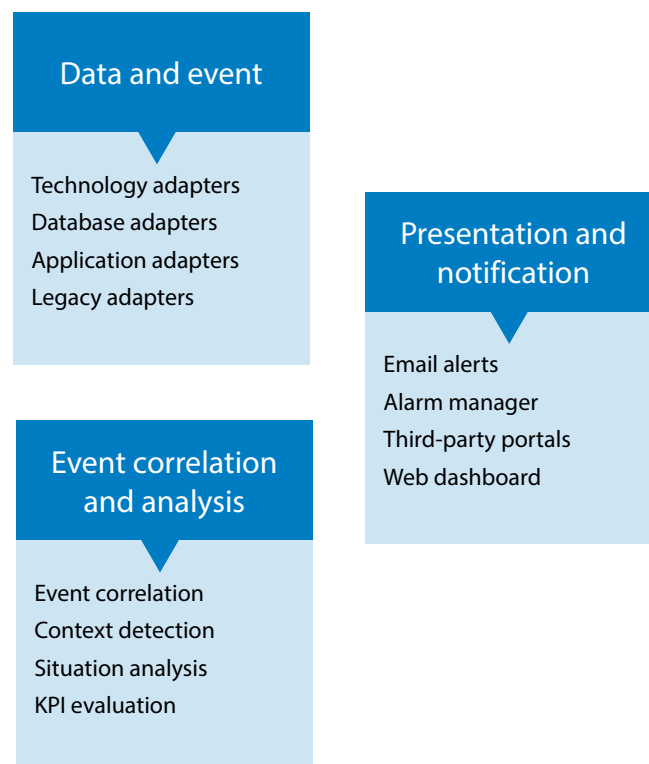
- **Open source implementation:** Banks can build the solution in-house with various open source frameworks available for BAM such as Apache Camel. This can be a preferred choice if the low licensing cost and no vendor lock-in is a priority.
- **As follow-up to your big data investments:** Next-generation BAMs may be able to integrate with big data solutions and provide what-if or adhoc queries.

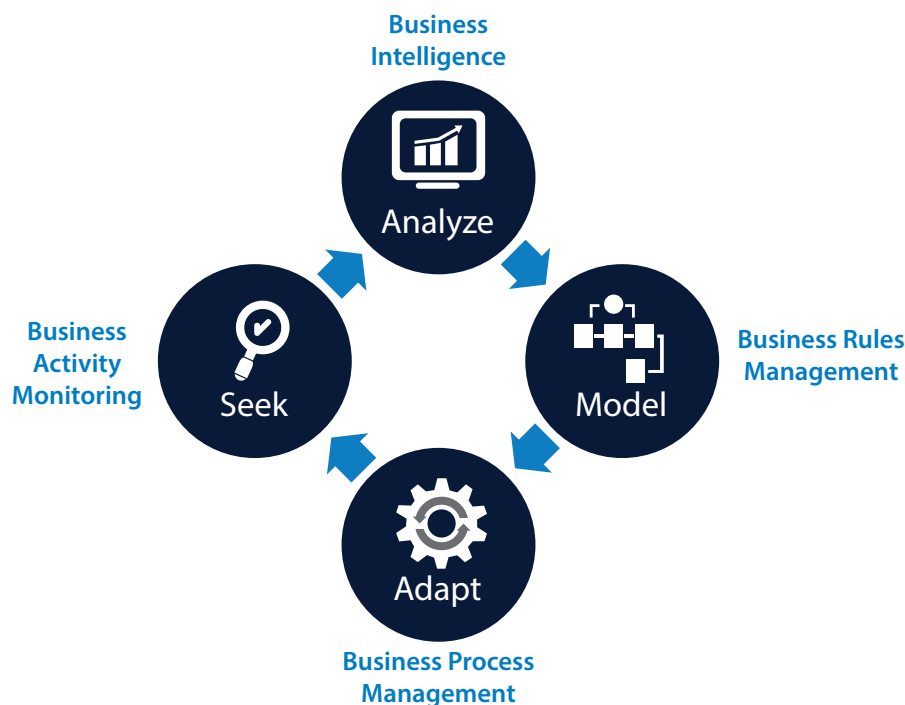
## BAM from an enterprise view: How BAM works for an enterprise

To understand how BAM fits into an enterprise and the way it works, let us look at the services provided by a typical BAM solution and deep dive into the backstage work that is carried out.

The following chart explains the various services offered by BAM:

To provide these outputs at an enterprise level, a BAM system relies on a seek-analyze-model-adapt approach. One of the main aims of BAM is to reduce the delay between the event and business response. At an enterprise level, however, BAM does not work alone; it works with BPM, BI, and BRM processes to complete the seek-analyze-model-adapt approach.





Business rules management implements business models. The business process is adapted by BPM processes. BAM is used to actively seek and provide data and updates. This is further analyzed by BI, which will use it to build models.

Fig 1: seek-analyse-model-adapt framework

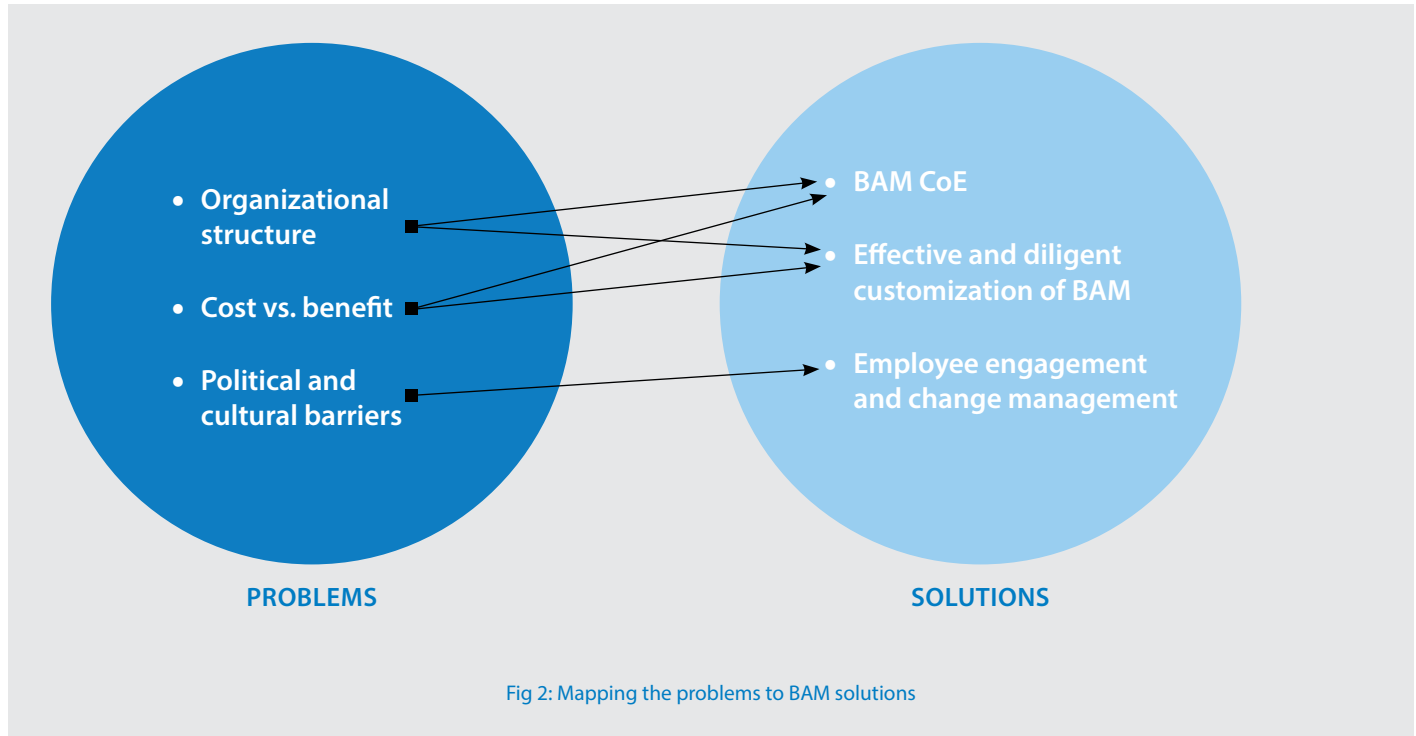
## Challenges

BAM is an essential practical solution that every firm must have. However, despite all the pros, BAM does not see very high and widespread deployment rates. While arguing a case for BAM, it is imperative to consider its limitations and reasons for probable failure. Adopting BAM, albeit an operational decision, is meant to affect / improve the way in which a firm / division manages finances and human resources. The primary roadblocks to BAM maybe in the form of:

| Organizational structure  | Political and cultural barriers  | Cost vs. benefit   |
|---|--|--|
| <p><b>BAM solutions are not one-size-fits-all</b></p> <ul style="list-style-type: none"> <li>Organizational silos are a known issue for many BPM projects</li> <li>Hurdles in mapping high-level metrics as outlined in balanced score cards to mid-level management</li> </ul> | <p><b>Organizations and people may react differently</b></p> <ul style="list-style-type: none"> <li>The way in which the organization reacts to such measures is a function of the political organization of the workplace</li> <li>Cultural factors and work ethic do vary widely across industries and regions</li> <li>The pan-organization transparency and easy traceability provided by BAM solutions may get mixed reception</li> <li>For example, in Europe, companies have faced trade union opposition to using BAM as a way to judge employees' personal performance</li> </ul> | <p><b>Very often the costs may appear explicit while benefits are implicit</b></p> <ul style="list-style-type: none"> <li>Even after implementation, a BAM project continues to function with a high degree of change</li> <li>This can provoke budget challenges when only the IT budget funds BAM maintenance</li> <li>Sunk cost dilemma – organizations may have invested in legacy platforms, so investment in a new technology may make those systems obsolete; champions of those systems may oppose BAM implementation</li> </ul> |

## Best practices

After having identified areas which may prove to be roadblocks to a successful BAM implementation, we progress to define a roadmap for the same. Let us start with mapping the problems to the solutions.



This deals with how to avoid or mitigate the roadblocks, thereby defining the following best practices:

- **BAM Centre Of Excellence (CoE)**

BAM as a technology is fairly new and hence the knowledge, skill, and experience regarding BAM implementation are scarce. Also, BAM products are continuously evolving and upgrading. This necessitates continuous support for users. To address this, creating a CoE on BAM is a good practice. It helps in the following ways:

- **Capitalizes on available knowledge**

Establish guidelines to improve dashboard development and maintenance. Business users need to be guided on how to make the most of existing and new features, especially for complex dashboards.

- **Facilitates seamless integration and synergies between business and IT**

A sound business-technology relationship acts as a facilitator for BAM-based solutions and vice-versa. To achieve this, we require translation of high-level KPIs into operational indicators. This further requires a holistic view of business and of the various business situation indicators. This can be achieved by a CoE.

- **Possible synergies between BAM CoE and BPM CoE**

Reusing and sharing knowledge between these can help a smoother transition to BAM. This especially helps if the BAM technology is linked to your BPM choice. However, this may not always be the case. When creating a BAM COE, we

should choose a team having diverse skill sets. This helps because of the multidisciplinary impact of BAM.

- **Employee engagement as a process of change management**

As we have mentioned earlier, effective change management processes must accompany BAM implementation. One of the ways to effectively manage change and hence implement BAM is to engage the operational staff and middle management in the process, from initiation. Some pointers for effective organizational management as a part of BAM implementation are:

- **First impressions**

The first leg of BAM implementation must be chosen strategically so as to project BAM's value to operations and middle management.





### ○ Training and communication

As mentioned before, the natural resistance to change is in-built in any organization or individual. There may be a reluctance to adopt new tools. The operations department may have been using self-developed tools and experience to track productivity or quality and consequently optimize performance. BAM offers a new systematic way of gauging performance which overrides human error or bias which may creep into their analyses and interpretations of results. This makes planning for the learning curve and training imperative.

### ○ Expectation and post-change management

Each BAM product is subject to its limitations in terms of the robustness of the analysis and the scope and depth of the data it can analyze. Too many dashboards and numbers can lead to confusing

results and consequent frustration. It is therefore very important to engage the management and operational staff, in order to help them understand and use the transparency that BAM provides. This also enables them to further enhance and improve BAM rather than become dependent on it.

### ● Effective fine-tuning of the BAM solution

The success of BAM is largely dependent on how it adapts to the organization. This further depends on how relevant the choice of metrics and alerts are. Some best practices in this regard are:

### ○ Stakeholder involvement in dashboard development

One of the key deliverables of BAM is an efficient dashboard which caters to the needs of the organization. In order to achieve this, one must understand how the stakeholders view and operate

business. The second thing of note is the way in which high-level business needs are translated into requirements and further into KPIs (from the resource perspective).

### ○ Choice of representation and action cases

BAM may prove to be a boon or a bane depending on how one uses it. This is the area which usually is responsible for failures in implementation. BAM offers a whole spectrum of indicators which, if not interpreted well, can prove to be overwhelming. We should analyze the various representation options and avoid indicators and measures, which are prone to multiple interpretations. Also a clearly defined response guideline to various alerts and values helps.

### ○ User feedback and iterative adjustment

BAM implementation is not a one-time process. Successful integration of a BAM system into processes and organizations requires multiple levels of trials and adjustments. This can also be viewed as one of the drawbacks or hurdles of BAM implementation.

Different users may react differently to the level of information provided by BAM. As mentioned in the previous point, clearly defined exception guidelines should be developed by means of user feedback and iterations.

## Our view

Tomorrow's winning businesses will be agile having near-real-time learning capability. BAM will be the secret sauce in that journey and organizations have already started investing in this capability. In the next few years, it will not be considered a competitive advantage but rather an absolute necessity to remain relevant.

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