A Roadmap to Intelligent Business

By Mike Ferguson
Intelligent Business Strategies

What is Intelligent Business?

Intelligent business is a fundamental shift in thinking for the world of data warehousing and business intelligence (BI). It is about putting BI at the heart of the enterprise and integrating it into operational business processes. The idea is that *operational* business process applications and portals can request *trusted* business intelligence *on demand* so that operations become "intelligent" by being guided by BI.

There is automatic monitoring of operational business activity events, requests for *just-in-time* BI and on-demand requests for predictive analysis to provide a recommendation for example. In the intelligent business, BI is not targeted at people such as business analysts for example but *targeted at applications within a business process*. The objective is ubiquitous BI in every activity in every business process across the enterprise so as to *guide* business operations towards achieving strategic business objectives. In most cases the operational business user doesn't know they are using BI. Behind the scenes, BI web services make it possible to dynamically integrate with operational systems. In that sense intelligent business requires that a business supports

- On- demand requests for specific intelligence e.g. about a specific customer
- On-demand requests for automatic analysis (done on behalf of users) of data, rule-driven automatic alerts and automatic recommendations
- Automatic capturing of events in business operations that trigger the integration of other data on-demand, to be automatically analysed and manual or automatic actions taken. This is known as business activity monitoring (BAM)

All this requires that BI is used in the context of an operational business task being performed in a business process. Therefore, business process activities have to be 'attached' to business objectives and goals declared in corporate performance management (CPM) software to help a company align business processes with its business objectives. Once this is done, we can then associate or target BI at specific business process activities so that the BI is used in an operational context to achieve a strategic business objective. Also this vision says that the number of requests for BI from people using BI tools is likely to be dwarfed by the number of requests coming from operational applications being used in front line operations by employees, partners, suppliers or customers. Figure 1 below shows the concept of intelligent business.

Notice from Figure 1 that operational applications surround and are 'wired' to rule driven BI services that access consistent integrated data in data warehouses and data marts. Also the CPM software is not only integrated with BI but also integrated with business processes so that we know what process activities are associated with what strategic objectives. Through the enterprise portal, people see their alerts, their recommendations, their actions, the on-demand BI that is relevant to their role in the context of any business process activity they are

performing at that time. They also see the collaboration tools that they need to do their jobs and collaborate with others.

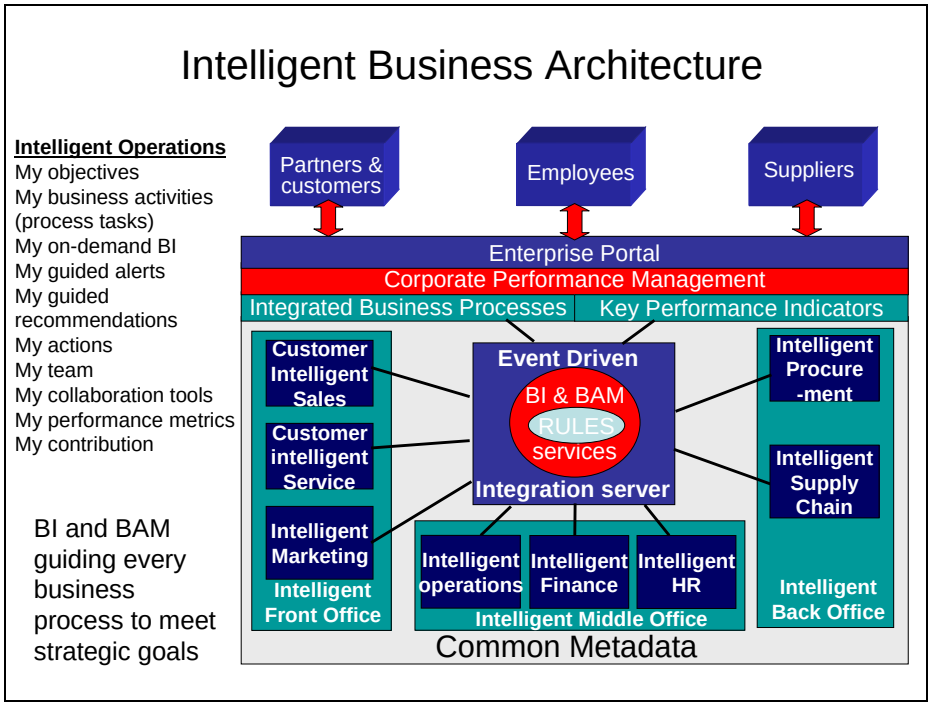

Figure 1

The Need for Common Metadata

A pre-requisite to integrating BI into operational business processes is that BI is *trustworthy, consistent and has common understanding.* Common data names, common data definitions, common data integrity rules across all BI systems are fundamental to making this possible. Without this, integrating BI into operations could cause untold damage to business operations especially if automated analysis and actions cause business changes to be made. Therefore the very first step involved in intelligent business is to ensure all BI data stores and BI tools use common naming, common definitions, common integrity rules and structuring of common data across all BI systems

Common metadata is the foundation stone to consistency and integrated BI. Once data is consistently defined in BI systems we are ready to integrate BI into the enterprise to empower operational business processes with just in time BI.

Intelligent Business

Having laid the foundation stone of common metadata, intelligent business requires that business intelligence is integrated into operational processes using enterprise business integration software (Figure 2). At present, enterprise business integration is dominating IT investment because it significantly reduces costs in business operations, improves efficiency and increases self-service.

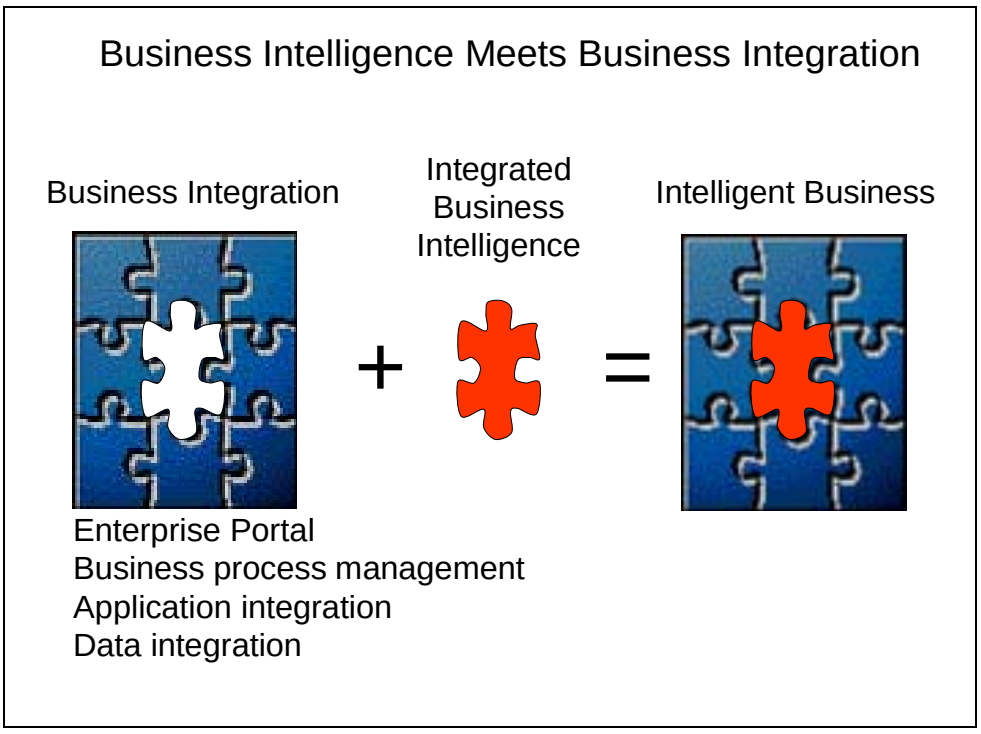

Figure 2

Many companies are integrating to join up their business while simplifying their IT set-up and getting rid of IT complexity to get more out of their existing systems (see figure 3). This IT simplification is like a 'corporate Atkins diet'.

Companies are seeking to *standardise* on IT infrastructure by going with fewer vendors who offer integrated technology platforms. We are seeing this in BI with standard *BI platforms* (a single end-to-end suite of integrated tools for building and deploying integrated BI) now available from single vendors (e.g. Business Objects, Cognos, Oracle, SAP, SAS). On the operational side, we are also seeing single complete *business integration platform* (technology stack) solutions now available from infrastructure vendors (e.g. IBM, BEA, SAP, Oracle and Microsoft) that support a common approach to all internal and external integration of user interfaces, business processes, applications and data. Integration platforms consist of a suite or 'stack' of integrated technologies including:

- Enterprise portal technology with integrated collaboration tools
- Business process management technologies
- A common shared rules service
- An application server
- Application integration technology
- Data integration technology for on-demand data integration targeted at applications

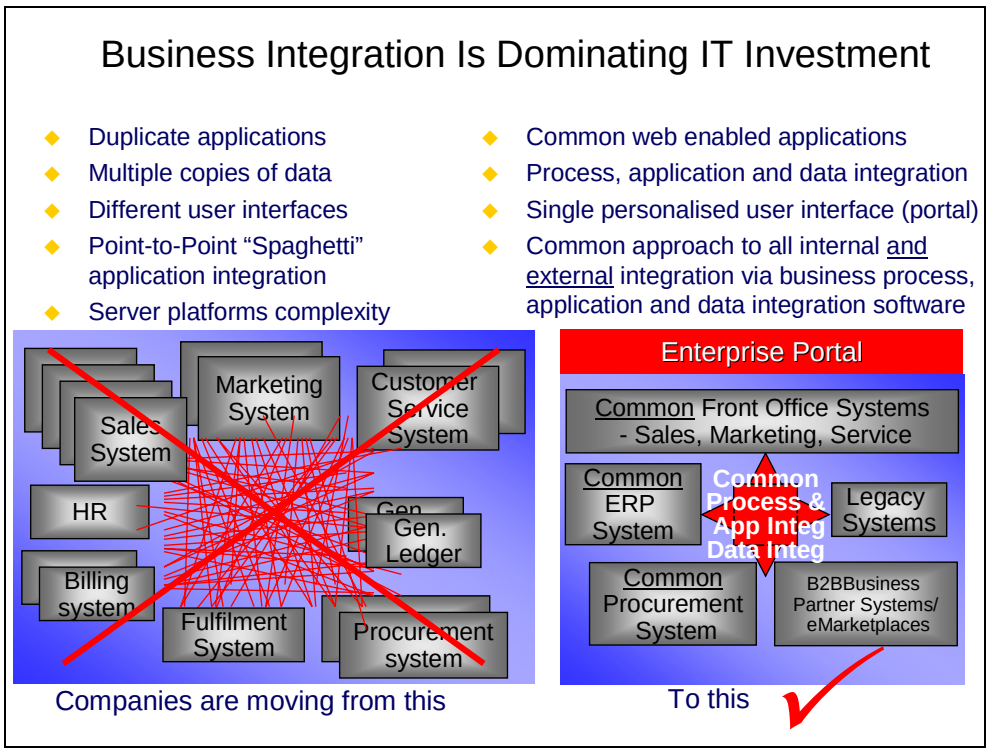

Figure 3

You might ask what this all has to do with in intelligent business. The answer is simple. If a common integration platform is being used to integrate operational business processes across the enterprise, then trusted BI can be plugged into this platform to maximise the opportunity of creating an intelligent business. The intelligent business must include key technology components from both the operational and analytical worlds. These components are:

- A standard business intelligence platform for business performance management
- A standard enterprise business integration platform
- A *shared* business vocabulary via metadata management and metadata integration
- Corporate performance management software integrated with analytic applications and with business processes

Stages to Implementing Intelligent Business

There are four main stages to implementing and intelligent business strategy. These are:

1. Define an intelligent business architecture
2. Integrated business intelligence (the BI element)
3. Enterprise Business Integration (the operational element)
4. Intelligent Business (the combining of operational and BI)

Note that stages 2 and 3 can and should be done in parallel.

The intelligent business architecture (Figure 1) acts as a blueprint for implementing the intelligent business. This architecture brings operational and analytic applications together in the context of business processes that present content to users via a personalised, secure web-based user interface – an enterprise portal.

Integrated business intelligence (stage 2) involves standardising on a common BI development platform to reduce the complexity and provide common technology for BI development. This stage also involves repairing existing BI systems by introducing a shared business vocabulary (data names and definitions) across all BI applications to support common understanding and consistency. Having done this, BI can be integrated so that islands of custom and package based BI systems plug into CPM scorecards and dashboards for rock solid enterprise corporate *governance*.

For *operational* performance management, companies need to capture operational events by integrating ETL data integration software with application integration platforms (EAI) to collect events and trigger on-demand near real-time data integration of structured and unstructured content when specific events occur. In addition, e*vent driven* *on-demand* *automated* analysis and a common rules engine will provide support for business activity monitoring (BAM), on-demand recommendations and alerts for guiding operations personnel towards achieving business objectives in the intelligent business.

Enterprise business integration (stage 3) should ideally be done alongside stage 2 so that teams in both areas work together and plan where and how to integrate BI into operations. Based on this architecture and achieving specific strategic objectives, this is about implementing integration at four main levels:

1. User interface integration,
2. Business process integration
3. Application integration
4. Data integration

so that these integration initiatives are done *in unison* to achieve a common strategic business objective e.g. to reduce operational cost.

User interface integration is done using enterprise portals with built-in collaboration and content management. Enterprise portal technology allows a company to give customers, suppliers, partners and employees personalised access to integrated content

Business process integration involves the separation of business processes from applications so that integrated business processes can be separately modelling (using business process modelling tools) to guide the execution of business process *across multiple* applications inside and outside the enterprise. A process engine then manages process execution. Once underway, executing business processes can then be monitored using business activity monitoring (BAM) and activity based costing (ABC).

Application integration sits below business processes and involves the use of a common platform for application integration and the use of web services, UDDI, SOAP, WSDL, and

XML. The process engine that is executing a business process sends industry standard SOAP XML messages to application web services connected to the enterprise integration platform to carry out specific process activities.

Stage 4 is the intelligent business stage. This is the integration of business process operations and BI for full business performance management. Here BI web services provide integration of BI into operational applications to make processes intelligent. In this way, each process activity leverages the relevant BI and/or recommendations on-demand. In addition the rules of a business process that describe the path that a process takes can be driven by BI. Hence if customer intelligence indicates a 'gold' customer, then they might be led one way though a process whilst a 'bronze' customer might be led another way through the process. This is made possible by common rules and a rules engine shared across applications. Vendors like PegaSystems, CA, Microsoft (Biztalk 2004), and Fair Isaac offer such engines and they are already doing this with their customers' business processes. In the world of intelligent business, the rules engine uses rules to cause automated alerts and recommendations during business activity monitoring (BAM) and alerts executives via CPM scorecards. In addition, because this rule driven decision/action engine is itself a web service it can be integrated into operational applications to issue recommendations on-demand to guide operational users using operational applications. Also in intelligent business, BI is integrated with enterprise portals for intelligent personalised e-business and guided operations (figure 4).

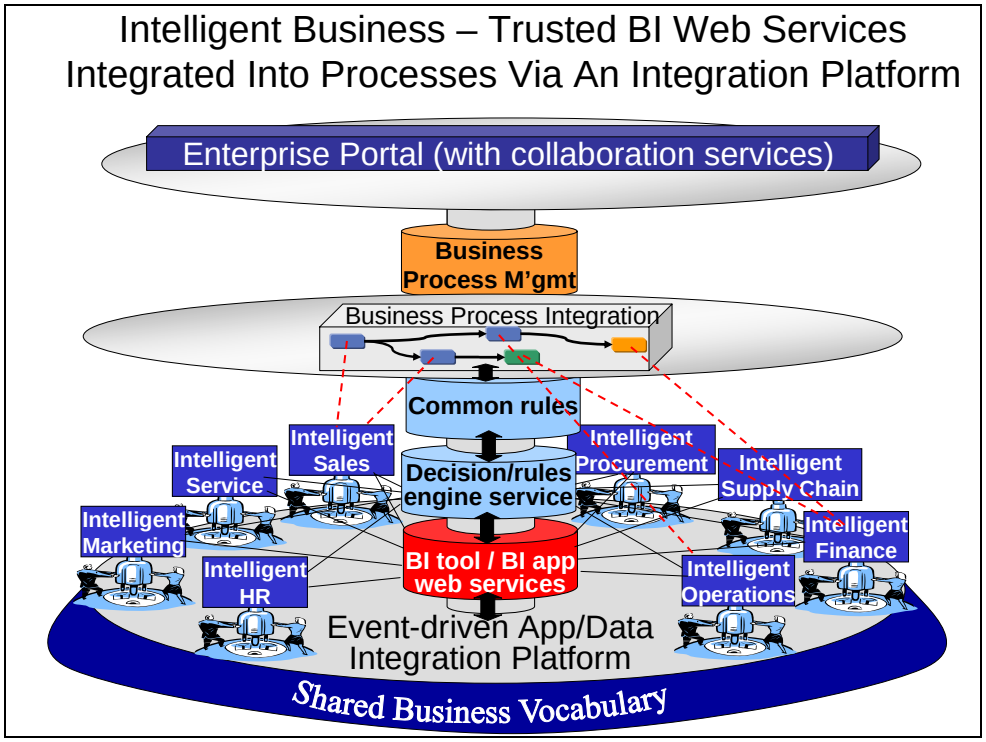

Figure 4

Note that a business process can span multiple organisational departments and multiple applications across the enterprise. So it is not enough to just understand the process. It is necessary to understand the roles of people who participate in the process and the applications

they use in each activity so that we understand what BI is needed and what we have to do to integrate it into business operations (figure 5).

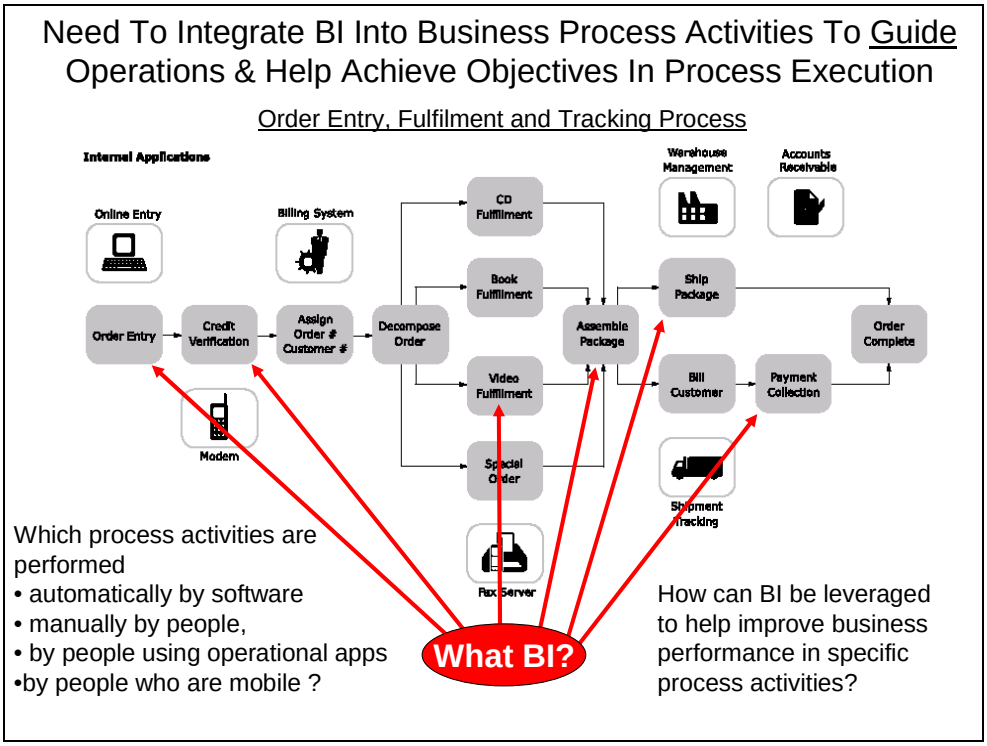

Figure 5 – Integrating BI into Business Processes

Clearly some activities in a process are performed automatically by software while others are performed manually by people. In automated activities BI can be integrated via web services so that a program can request BI on demand via a standard mechanism. If the activity is performed by a person, then several other things need to be understood. These include the role of the user and what applications people use when performing a specific business process activity. Also if the person is normally mobile they would need to have access to BI from a mobile device? It is highly likely that people in many different *roles* throughout the enterprise can all contribute in some way to achieving the same business objective. Role recognition is therefore extremely important and different approaches may be needed to integrate BI into business processes to fit with the role of each user (e.g. customer facing call centre operator, bank branch counter staff, salesperson etc.). The objective is to deliver the right BI in the context of a specific process activity being performed at a specific time. People in multiple roles contribute to the same objective. Therefore, detailed investigation needs to determine the following:

- What process tasks they perform and what applications they use
- During what tasks is BI needed?
- What BI do they need to help them contribute to the common objective?
- In what form do they need BI e.g. reports, guided analytics, instant live recommendations integrated into another application, alerts…..
- Do they have time to use a BI tool or not?

- Do they need the BI delivered on a mobile device?
- Does the use of BI systems need to be totally transparent to the user? i.e. automated analysis, automated recommendations, automated alerts etc.
- What actions does a person in this role need to take?
- Do they need to collaborate with others before taking action?
- Is the action expected to be automatic (i.e. no people)?

Answering to these kinds of questions will lead to a clear understanding of what kind of closed-loop BI integration strategy is needed to support specific users who are performing specific activities as part of a business process. It should also highlight that each role may need a different closed loop BI integration strategy. For example a customer service representative in a call centre has no time to use a BI tool and must have BI integrated into the operational application they use to guide them during dialogue with customers if they are to ever become more effective in contributing towards a strategic business objective. Equally an executive needs BI integrated into CPM software. Both require BI to be integrated in different ways to help them do their job in an intelligent business. Identifying the correct BI integration strategy the fits the user need (e.g. call centre operators have no time to use BI tools) is therefore a critical success factor.

Technical Requirements For BI Integration

Over and above the investigative work defined above, the following are a non-exhaustive list of technical requirements that help integrate BI into operational systems.

- Integrated business intelligence
- Integration between EAI and ETL for event driven near-real time data capture
- XML input support in the data integration platform (ETL) technology
- Web services support from BI tools and analytic applications
- Common data naming for the same data across all BI data models and BI tools
- CPM software to build dashboards and scorecards that link lower level metrics to KPIs and objectives in the business strategy
- An automated rules engine integrated with BI to help manage and drive day-to-day business operations

Based on the above needs there are a number of ways to integrate BI into the enterprise:

1. Integration of analytical applications with operational applications using an enterprise portal for access and exploitation by internal and external users
2. Embed analytics in operational applications during application development
3. Introduce web services to dynamically integrate analytical processing with internal and partner operational applications
4. Deploy real-time processing for user alerts, on-demand recommendations, and automated actions

Conclusions

There is no doubt that intelligent business is coming and companies will strive to turn their organizations into intelligent businesses. A shared business vocabulary is critical to achieving

this and to creating consistency across the enterprise. Also business integration is needed using both a standard enterprise integration platform and a standard business intelligence platform. In addition business intelligence systems need to be "cleaned" up to make them consistent before integrating BI with operational business processes.

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