

# Maximising the Value of Your BI and Machine Learning Models in a Data-Driven Enterprise

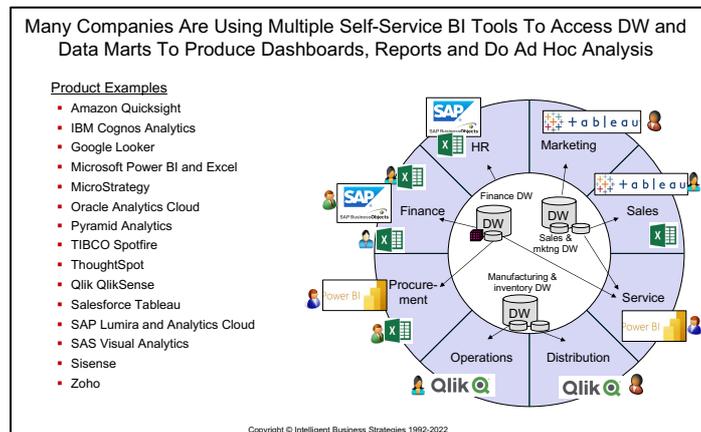


By Mike Ferguson, CEO, Intelligent Business Strategies

For many years the traditional data warehouse and business intelligence has been used for analysis and reporting. In fact, many companies have built multiple different data warehouses in different parts of their value chain. For

example, machine generated data such as clickstream data, log files and IOT data.

Also, human generated data such as social network opinions or customers buying. It is about that plus a lot more including capturing all interactions with customers over time whether they be via email, web chat or phone. Also, understanding customer opinions and sentiment, their hobbies and interests, their profession, their relationships, their online behaviour and much, much more. Companies want all of this in near real time so that they can analyse it to improve customer experience and offer better service as they interact with customers.

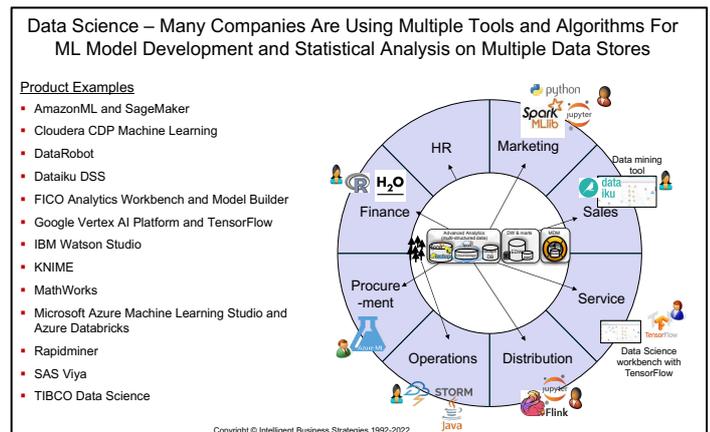


example, there could be a data warehouse in marketing and sales, and another in finance, and another in an area of operations such as manufacturing and inventory management. It is also common to see organisations using multiple self-service BI tools to access data warehouses and data marts to produce reports, dashboards, stories and do ad hoc analysis.

However, the last decade has seen a step change in data and analytics with a frenzy

of activity. Many new data sources have emerged both from inside and outside the enterprise that go way beyond the traditional structured data used in data warehouses. For example, machine generated data such as clickstream data, log files and IOT data. Also, human generated data such as social network opinions or customers buying. It is about that plus a lot more including capturing all interactions with customers over time whether they be via email, web chat or phone. Also, understanding customer opinions and sentiment, their hobbies and interests, their profession, their relationships, their online behaviour and much, much more. Companies want all of this in near real time so that they can analyse it to improve customer experience and offer better service as they interact with customers.

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*“The demand for data has resulted in multiple analytical systems optimised for different analytical workloads”*

It is this thirst for data that has spawned many different new analytical workloads,

many of which are running in different analytical systems outside of a data warehouse. Today we have real time streaming analytics, graph analysis, and data scientists building machine learning models on cloud storage using notebooks and Apache Spark. So, we are now dealing with multiple analytical systems optimised for different analytical workloads many of which are running on the cloud rather than on-premises. In fact, all of the different types of analytical systems mentioned are now available on the cloud most of which are underpinned by cloud storage. We've seen a flurry of new technologies over the last decade as new data science tools have emerged together with new algorithms to the point where today, much like the fact but we have multiple business intelligence tools in the enterprise, we also have multiple data science tools including Jupyter notebooks, RStudio, in-database machine learning, and full blown data science workbenches some of which are running on premises and some of which are running in the cloud. Data scientists are developing machine learning models and deploying them in real time streaming analytical systems at the edge, in Hadoop, in data warehouse databases and as web services with an API for on demand access from other applications. Similarly, business intelligence tools are now accessing real time data in motion, directly accessing files on cloud storage and on Hadoop and also querying data in graph databases as well as traditional data warehouses and data marts.

*"We have created a fractured approach to developing BI reports and ML models using multiple technologies"*

So, what we have is a lot of analytical activity

going on across the enterprise in different parts of the business on different analytical systems in a hybrid, multi-cloud distributed computing environment. The problem is that with all of this activity going on, we have created a fractured approach to developing business intelligence artefacts and analytical machine learning models using multiple technologies in different departments. So, there's very little reuse and sharing. Instead, we have siloed BI and data

science initiatives happening in different departments.

However, departmental BI and data science teams often means that there is a departmental focus rather than alignment with broader corporate business strategy. As a result, management of business intelligence reports, dashboards and machine learning models across the organisation is uncoordinated. So much so that people are unaware of what others are building or have built. This means there is unawareness and limited reuse of trusted analytical artefacts and no easy way to know what exists across multiple tools that are in use. In addition, there is a lack of integration of these analytical artefacts (reports, queries, dashboards, machine learning models) into processes, applications, tools and websites. There is also limited reuse of trusted data. In fact, data integration is repeatedly being reinvented which can result in inconsistency.

Don't get me wrong, C-level executives absolutely know that analytics drives value. In fact, surveys<sup>1</sup> show that the majority of CEOs are focussing on using BI, machine learning and AI to improve customer experience, strengthen customer relationships and improve efficiency. However, to maximise value in these areas it is clear that executives don't want fractured use of data and analytics. On the contrary, having emerged from a pandemic, they want the opposite - coordinated use of data and analytics so that people at all levels of the enterprise execute on the same business strategy and make decisions that together contribute to common business outcomes. In other words, they want everybody associated with contributing to a common business outcome, like improving customer experience, to pull on the same rope to achieve the outcome. Also, that this should happen no matter whether they work in operations or are middle managers or are executives accountable for those specific outcomes (see below). All of them need to row in the same direction as shown below.



Furthermore, in many cases, usage of business intelligence and machine learning models is happening more at middle management level than elsewhere in the business. Yet, there is huge pent-up demand to deploy more of it in everyday operations and at strategic levels in the enterprise and join it all up so that people across the enterprise utilise these analytical artefacts to contribute to common goals.

Given this desire, two questions to ask are:

- What business intelligence and machine learning models are in play in your organisation to help achieve each specific strategic business objective?
- Where should these analytical products be deployed and who or what needs to use them to achieve that common goal?

<sup>1</sup> Institute of Business Value - CEO Study 2021

Looking at these questions, the stark realisation is that it's not just about building reports and dashboards, predictive and prescriptive models using many different tools. We are now in an era of deployment and usage rather than just development. What executives now want is to put all these analytical products to work. To achieve that, companies need to industrialise and speed up build of data and analytical products and make it easy to quickly deploy them in such a way as to maximise the contribution of the insights they produce and the decisions they support to improving business outcomes.

However, if you are going to industrialise, companies need to get rid of the fractured setup, fix the data foundation by creating trusted high quality compliant data products and to adopt a factory-based manufacturing style approach to speeding up development. We also need to create a data and analytics marketplace and classify analytical artefacts that are being built in multiple tools, such as reports, dashboards, machine learning models, by business objective. In other words, we need to know what combination of reports, dashboards, machine learning models should be used and where should they be used to improve customer experience or optimise a supply chain or reduce fraud? We need on demand and event driven analytics with alerts, recommendations and automated actions. We also need reinforcement learning if we are to continuously improve business outcomes.

The first step in doing that is to get rid of the silos understand what we've built around the enterprise using multiple different tools. We need to know what BI reports, dashboards, stories, machine learning models and AI driven automation services exist across the enterprise. We need an enterprise analytics marketplace to publish all of these from multiple tools and organise them as business ready BI, predictive, prescriptive and automation services that are available and ready to use.

*"We need an enterprise analytics marketplace"*

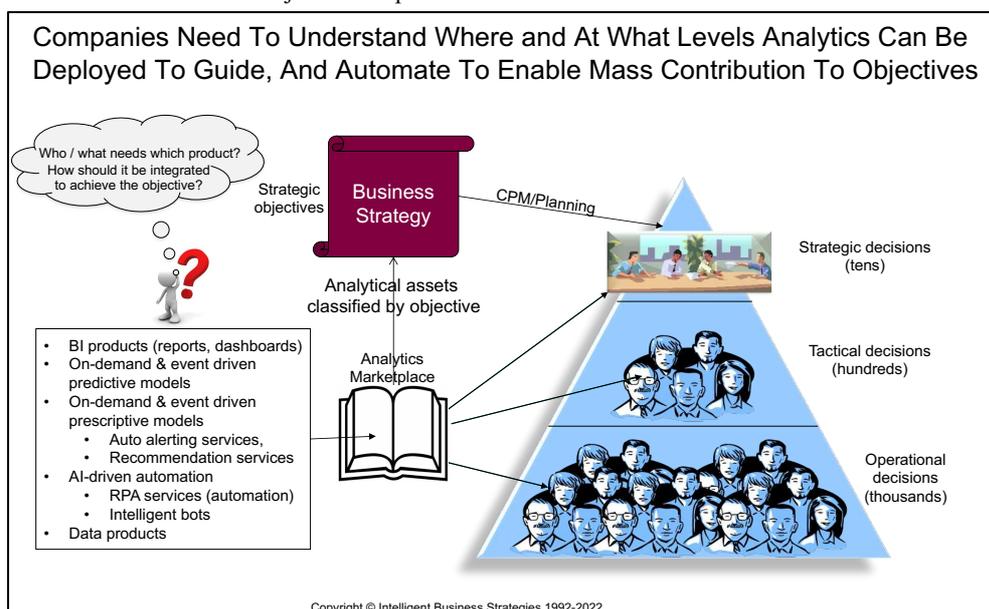
You may ask, what is an

enterprise analytics marketplace? It is a catalog application that provides a shop window in your enterprise that contain ready-made, trusted, analytical products available as services (with full metadata lineage) that are tagged and organised to make them easy to find, access, share, deploy, use / reuse. The marketplace provides supporting metadata on what they all are and what they do. We also need to integrate these into business processes and applications across the enterprise. Different types of the analytical products may exist in an analytics marketplace. This includes reports, dashboards, stories, predictive models, prescriptive models, alerts, recommendations, automated action services, plans etc. All of these should be published in an enterprise analytics marketplace.

Consumers can then go to the marketplace and search for these analytical artefacts, to see what they can immediately pick up and use. They want to see these services rated, to know who created them using which tool and when, who owns them, who else uses them and are there any opinions that exist about them. They also want to see them classified by business objective. For example, this is the collection of reports, dashboards, stories, predictive models, prescriptive models, alerts, recommendations, and automated action services that have been built to improve customer experience or to reduce fraud or to optimise a supply chain. Aligning these artefacts with business objectives help to

understand their contribution to business goals. That's the whole point about a marketplace and over time as more ready-to-go 'analytical products' become available, the more valuable it becomes. It should also be able to provide insights about where and how frequently these analytical artefacts are used.

However, it doesn't stop there. It's not just a case of creating all these analytical products and putting them in a marketplace hoping they will be used. There needs to be coordination. It should be part of specific plan to improve specific business outcomes. There needs to be accountability so that we know who is building what and for what business purpose. Also, once built, where each analytical product will be deployed and used to improve customer experience or to reduce fraud. So, the challenge is to work out in which parts of the business (e.g. marketing, sales, finance, operations, etc.), in which processes and at what levels (e.g. operations, middle management, or executive), do these analytical products need to be deployed and used to maximise the chance of improving a specific business outcome.

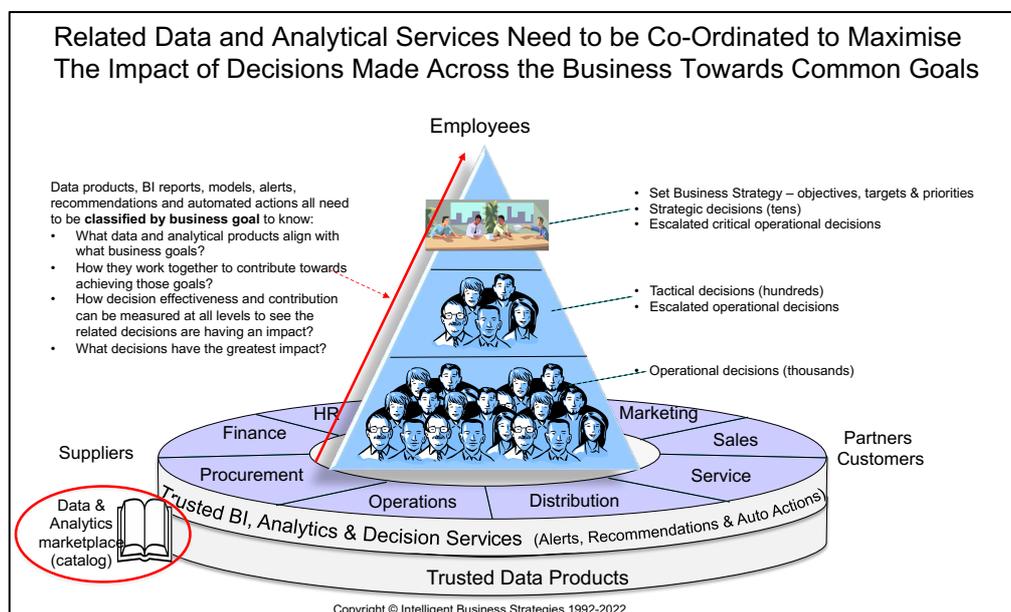


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It is also about recognising that it is a family of reports, dashboards, stories, predictive models, prescriptive models, alerts, recommendations, and automated action services that need to be deployed. It's not just about one report or one

machine learning model. It is the realisation that an entire family of these is supporting decision making at different levels of the enterprise across different departments to help contribute to a business outcome.

So, we need coordination to work out what BI, machine learning models, AI and automation needs to be integrated into what business process activities to help achieve business objectives during process execution. The role of the marketplace is critical to helping achieve this.



To conclude, we have to recognise that it is not just the development of analytical products in different tools that matters. That is only half the story. It is the correct deployment of these so that the collection works together to achieve a goal. This is not about business intelligence. It is about intelligent business, and they are not the same.

### About Intelligent Business Strategies

Intelligent Business Strategies is an independent research, education, and consulting company whose goal is to help companies understand and exploit new developments in business intelligence, machine learning, advanced analytics, data management, big data, and enterprise business integration. Together, these technologies help an organisation become an *intelligent business*.

### Author



Mike Ferguson is Managing Director of Intelligent Business Strategies Limited. As an independent IT industry analyst and consultant, he specialises in BI / analytics and data management. With over 40 years of IT experience, Mike has consulted for dozens of companies on BI/Analytics, data strategy, data architecture, data governance, technology selection, and enterprise architecture. Mike is also conference chairman of Big Data LDN, the fastest growing data and analytics conference in Europe. He has spoken at events all over the world and written numerous articles. Formerly he was a principal and co-founder of Codd and Date Europe Limited – the inventors of the Relational Model, a Chief Architect at Teradata on the Teradata DBMS, and European Managing Director of Database Associates. He teaches popular master classes in Data Warehouse Modernisation, Big Data, Enterprise Data Governance, Master Data Management, Creating Data Products in a Data Lake, Lakehouse or Data Mesh for Use in Analytics, Machine Learning and Advanced Analytics, Real-time Analytics, and Data Virtualisation.



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