

Augmented Business Intelligence: **the massive adoption of edge data technologies**

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Introduction

The idea of **collecting data** and **generating information** and **KPIs** to **monitor businesses** and **measure impacts** of strategies, process optimizations and project implementations is **not new** to anyone who works in **companies oriented to maximize their results**. In fact, the connection between KPI monitoring and business management is far well known and eternized in expressions like **“what can’t be measured, can’t be managed”**, but, as most of these managerial statement clichés, **it’s not always trivial** to collect the right data, to perform **consistent data cleansing and to calculate certified KPIs** in order to analyse business performance and to make **correct** and **timely decisions based on data**.

The challenge **scales-up** when talking about **big** and **complex enterprises** in which **data** is generated **everywhere**, where **different areas** have their **own perspectives** about process performances and business trends, considering **different data-sources**, performing **different data cleansing procedures** and using **different formulas** to calculate the **‘same KPIs’**.

It’s in this context that **Business Intelligence (BI)** solutions became **relevant in ICT budgets** more than a decade ago: **‘why not centralize data management and KPI calculation in ICT teams, to ensure a Single Source of Truth and reduce the effort of business users on data manipulation activities, making them responsible just for analysing business-ready data?’** We all know where this story ended: **decentralized data in excel spreadsheets across the company**.

Though (or should we say ‘because’?) this story has failed, in recent years **BI solutions** matured **dramatically**, finding their space in the so-called **edge data technologies**, together with the Artificial Intelligence, Advanced Analytics, Cloud solutions, and so on. As a result, Gartner confirmed the trend from previous years and pointed to **BI as one of priorities of big enterprises CIOs for 2021**¹.

BI lives again, long live BI!

What is old is new again

It **seems Business Intelligence** has really **returned to stay (and grow)**. If **at its debut** it was all about **centralized** and **enterprise-level reporting** to better organize data across the company, **reducing business** teams’ **ability to analyze data** due to **ICT-limited** capacity to quickly respond to their needs, **the modern BI solutions** brought **self-service ad-hoc** capabilities to the masses, improving their **front-end features** to provide **pixel-perfect reports**, enabling easy **data integration** through hundreds of connectors and improving their **data manipulation capabilities** for data transformation and **KPI calculation, all in an ICT manageable way**.

But beyond these features, that definitely improved platform capabilities to respond to the previous objective (**“monitor-to-manage”**), the **most innovative BI solutions** captured their raison-d’être in the edge data technologies environment: **the turning-point is the massive adoption of edge techs by business users**.

DEEPENING

Currently known as *Analytics & Business Intelligence (or Augmented BI)*, platforms like *Power BI, Tableau, Qlik Sense, Thoughtspot, Looker, Microstrategy, Spotfire, Oracle BI, SAP Analytics Cloud, etc.* are enhancing their values exploring cloud solutions, artificial intelligence, machine learning, natural language processing, cognitive engines and augmented experience features.

Augmented Business Intelligence Roadmap

From reporting to augmented intelligence

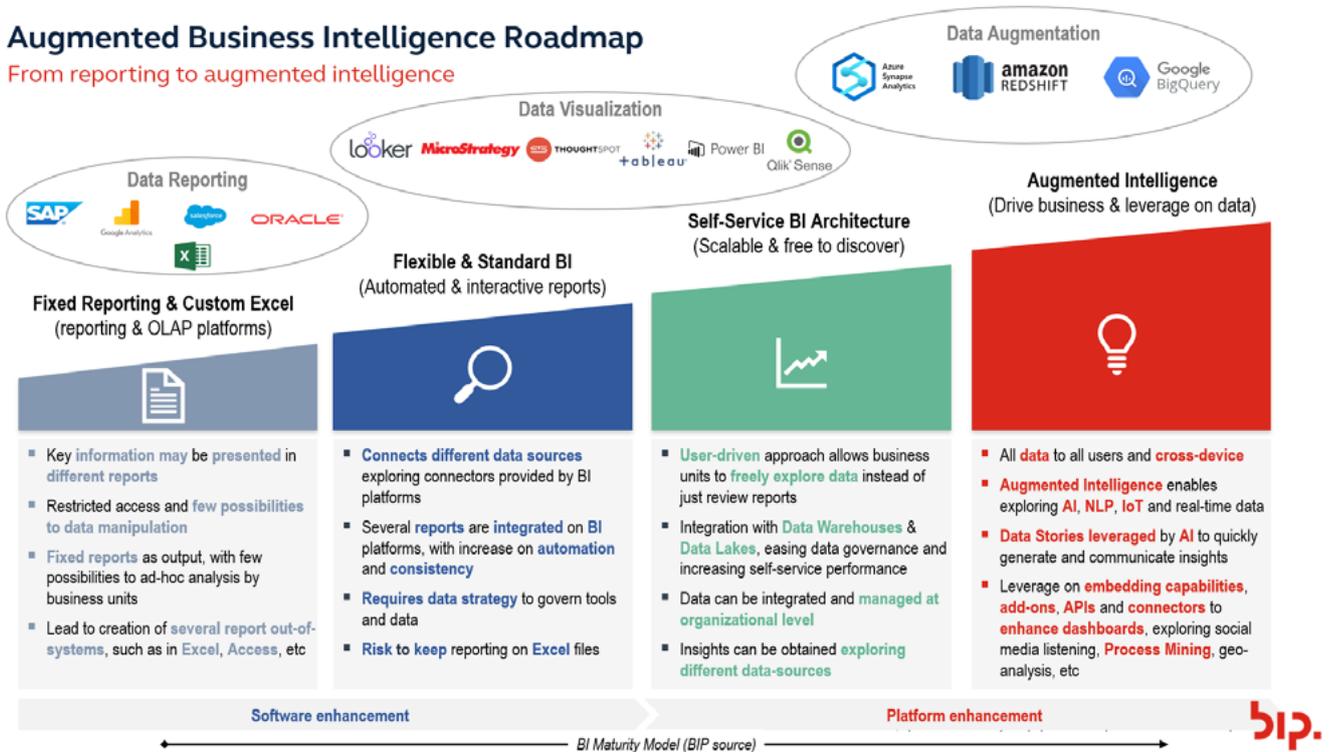


Figure 1 ABI Roadmap

But what is really new?

According to Gartner², “**Augmented Intelligence** is a design pattern for a human-centered partnership model of **people and artificial intelligence (AI)** working together to **enhance cognitive performance**, including **learning, decision-making and new experiences**”. In other words, Augmented Intelligence is oriented **to improve, not to substitute**, professionals in their jobs and decision-making processes through **the facilitation of understanding and usage of AI** while playing their roles.

DEEPENING

The *Augmented Analytics*³, in turn, is the “*use of enabling technologies such as machine learning and Artificial Intelligence to assist with data preparation, insight generation and insight explanation to augment how people explore and analyse data in analytics and BI platforms*”.

Although **modern Analytics & Business Intelligence** platforms have implemented several new features of Augmented Analytics, in this article we highlight some **key innovations** that will **dramatically impact** the way companies consider BI platforms in their ICT strategies:

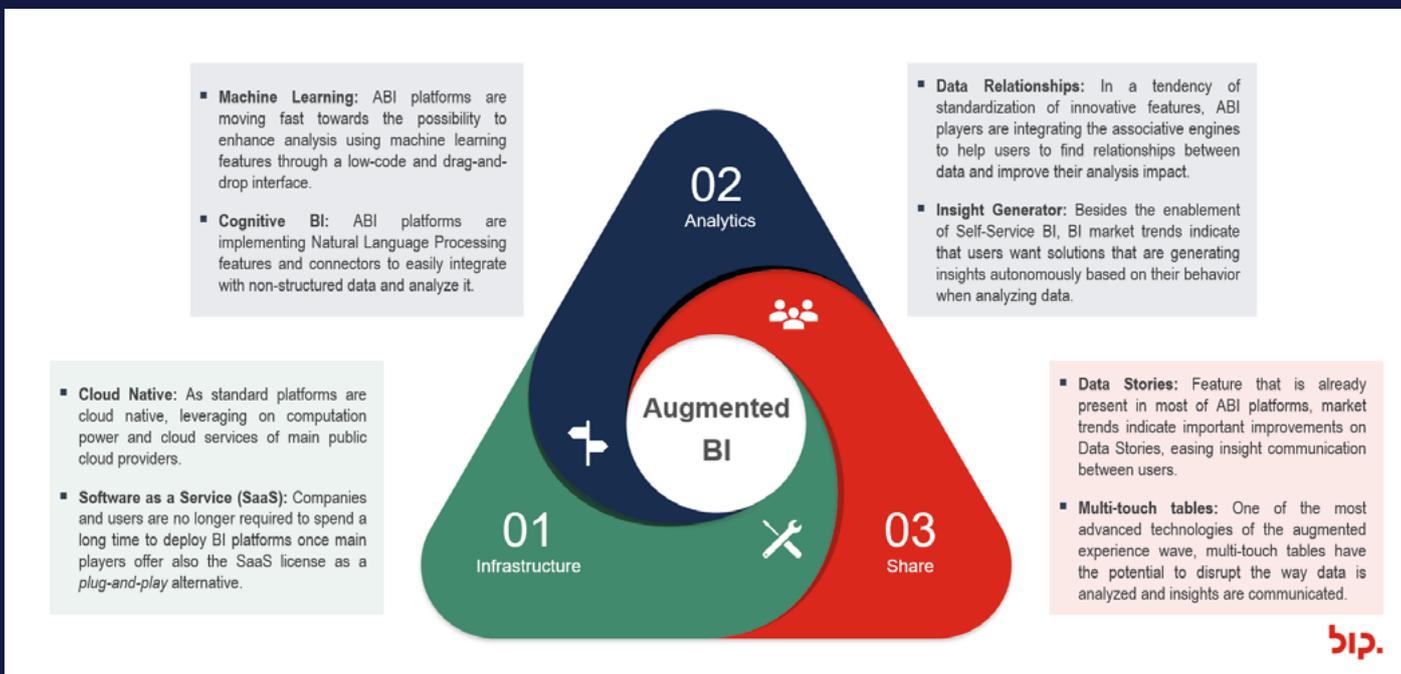


Figure 2 ABI Key Innovations

Infrastructure

Identified as **one of the challenges** for BI platform implementation and enhancement in several companies, modern **ABI solutions have to be up to date with data and technology trends**, dealing with requirements for **storage capacity, computational power** and a **variety of enterprise IT architectural blueprints**.

Cloud Native BI

Cloud is already a reality. In Q3 2020, **AWS, Azure** and **Google Cloud** reported a **year-over-year growth (YoY) of 29%, 20% and 45%, respectively**⁴ and, according to Forbes and Dresner Advisory Services in the study “2020 Cloud Computing and Business Intelligence Market Study”, **a record percentage of enterprises, 54%, say that Cloud BI is either critical or very important to their current and future initiatives**⁵.

DEEPENING

Positive sentiment towards Cloud BI saw a sharp upturn in 2018 and it has since risen both in 2019 and 2020, when it climbed from 3.22 to 3.4 (well above the level of “important”). Compared to the early years of their focused study, it appears that Cloud BI conquered skepticism and crossed a threshold of credibility. Dresner’s research team expects that Cloud BI adoption will continue to rise.

Cloud Native BI brings **strong capabilities to companies** thanks to public cloud providers **no longer requiring capital expenditure (CAPEX)** on storage and computing and **enabling a pay-per-use logic based on operational expenditure (OPEX)** – the more storage and processing you use the more you pay. Besides, **Cloud Native BI easily integrates with Cloud Services** to tackle real-time data, non-structured data, natural language challenges, denormalized data and SQL querying.

Software as a Service (SaaS)

Aware of companies’ needs, ABI platforms develop several **alternatives of deployment** for their solutions in **different enterprise IT architectures**, to the point of providing a full-managed service in which users just buy their SaaS licenses and then are ready to play.

DEEPENING

According to the 2020 Gartner Report⁶, the three market leaders, Power BI, Qlik and Tableau, already have their SaaS offerings, and new product launches reinforce this market tendency. Last year, for example, Qlik launched the Qlik Data Transfer⁷, a free service to transfer on-premise data to Qlik Cloud in order to boost the adoption of the SaaS version of Qlik Sense Enterprise.

Analytics

This topic may be considered as one of the **most important capabilities** of Augmented BI platforms once **it enables business users to deal with data and obtain insights autonomously**.

DEEPENING

According to Information Week⁸, analytics is entering the mainstream in 2021, which means more enterprise organizations will be able to take advantage of its benefits to accelerate business intelligence, machine learning, and other forms of artificial intelligence in their organizations, be it more productive projects or faster insights for decision makers.

Machine Learning

Modern ABI tools are looking for ways to **better integrate their platforms with machine learning models** to boost data analysis, **keeping a low-code approach and increasing ML adoption across companies**.

At the end of 2020, **Qlik announced⁹ that they are on a journey to provide customers the ability to use ML capabilities on their platform**, for purposes like optimizing supply chain, improving inventory management, preventing customer churn, etc.

DEEPENING

Following this strategy, AWS and Qlik have partnered with the joint vision of democratizing predictive analytics by creating the Qlik-SageMaker Connector, an integration with Amazon SageMaker, a managed service design to drive and scale the entire ML lifecycle, by bridging the Qlik Sense Server and SageMaker Hosting Services. Through the connector, Qlik Sense users can source real-time predictions from an Amazon SageMaker hosted model through Qlik's in-memory engine.

Tableau, in turn, **created the possibility to deploy ML models in Python using the TabPy library¹⁰**, easing ML model output presentation and model deployment in Tableau and making it accessible to business users. At the end of 2020, in its annual conference, **Tableau announced its plan to bring together Tableau and Einstein Analytics¹¹**, both of Salesforce.

Planned for the first part of 2021, Einstein Discovery in Tableau enables **real-time predictive modelling** and **recommendation capabilities** across the Tableau platform¹¹.

DEEPENING

According to the company, "Tableau and Einstein Analytics will come together through a set of product integrations that will provide a more seamless experience for joint customers".

Einstein Discovery helps companies democratize data science across their organization with AI-powered analytics that enable business users to automatically discover relevant patterns based on their data.

In this context, Microsoft, the BI market leader, is **boosting ML capabilities** on Power BI through **native integration with Azure**. Still in 2019, Santosh Chandwani, Principal PM of Power BI, announced the preview of **Automated Machine Learning (AutoML) for Dataflows in Power BI**.

AutoML enables business analysts to build machine learning models with clicks, not code, using just their Power BI skills.

DEEPENING

With AutoML, the data science behind the creation of ML models is automated by Power BI, with guardrails to ensure model quality, and visibility to ensure you have full insight into the steps used to create the ML model. Following the Cloud Native tendency, this functionality is only available on Power BI Premium and Embedded, both enterprise cloud-based licenses of Power BI¹³.

Cognitive BI

Following the tendency of ML enhancements on ABI platforms and exploring Cloud Services, we can say that **Cognitive BI solutions are like a young brother** of the previous innovation with a still modest adoption.

DEEPENING

Gartner projects that, by 2025, AI for video, audio, vibration, text, emotion and other content analytics will trigger major innovations and transformations in 75% of Fortune 500 global enterprises⁸.

Aware of this other tendency, modern ABI tools are already **integrating text analytics** capabilities in their platforms, providing **connectors to web and social media data and performing entity recognition and sentiment analysis.**

DEEPENING

In 2020, Power BI announced the inclusion of semantic search functionalities in its roadmap¹⁴.

Data Relationships

First created by Qlik, **the Associative Engine was designed specifically for interactive, free-form exploration and analysis**, with the ability to fully combine large numbers of data sources and index them to understand the associations.

DEEPENING

*With this characteristic, any user – at any skill level – can search and explore their data in any direction, following their curiosity wherever it leads. According to Qlik, “it’s like having peripheral vision, removing blind spots and uncovering hidden insights that aren’t available in query-based tools”¹⁵.
Well, as with most successful innovations on the market, solutions oriented to automatically understanding connections between data were launched, like the Semantic Graph of Microstrategy¹⁶ that, together with the Hyperintelligence feature, put Microstrategy as a Challenger in Gartner’s 2019 Report on ABI.”*

Insight Generator

As previously mentioned, to succeed in their adoption across enterprises, ABI platforms had to be ready to provide self-service BI environments, enabling business users to perform their own analyses instead of being “locked” on pre-made dashboards. Recent studies highlight that **users often don’t want to self-serve; they increasingly expect insights to come to them. AI will play a major role here**, surfacing micro-insights and helping us move from scripted and people-oriented processes **to more automated, low-code and no-code data preparation and analytics¹⁷.**

DEEPENING

Regarding this, Thoughtspot provides an innovative solution based on the following pillars: Spot IQ and Search Engine. Spot IQ consists in an engine able to perform thousands of queries into underlying data and autonomously provide insights to users. The engine's performance is improved by its ML model oriented to self-training, based on user evaluations of the generated insights. Finally, with its Search Engine, users no longer need to calculate KPIs manually, but they can simply ask the platform directly using natural language¹⁸.

In the second semester of 2020, Qlik announced its Insight Bot, which is an AI-powered conversational analytics experience, oriented to giving everyone a faster and easier way to ask questions, get insights, and make data-driven decisions using natural language¹⁹.

Conversational BI

In the evolution to Natural Language, why not also consider the possibility of Conversational BI? **crystal**, an augmented analytics tool by Milan-based scaleup iGenius, allows users to **submit questions via voice or text**: crystal translates these into queries on a relational database and responds in real time. Responses will be served up via voice or charts, based on the data retrieved. crystal can understand concepts such as aggregation, averages, filters, data pivoting, depending on how questions are formulated.

DEEPENING

The platform's AI is able to recommend follow-up questions or NBQ (Next Best Questions) to users, based on history of use. Crystal can be configured quickly and in a way that is tailored around users' specific needs, thanks to a "no-code low-code" configuration console. The product is currently available in English and Italian.



Figure 3 crystal in action

Share

Regarding this topic, **important changes are expected in the way professionals communicate results and insights**. In a context of increased collaboration activities, **professionals need more dynamicity** to easily share information, receive feedbacks and improve.

Data Stories

Data stories consists in the **setup of a guided dynamic flow into a dashboard analysis to perform a storytelling that can be interactive and progressive**, keeping the audience engaged

without the need to create long presentations.

Currently, the main **ABI players already offer data stories** functionality, but its usage isn't massive among business professionals. Rita Sallam, Gartner VP analyst, highlights that **data stories can help move organizations beyond the dashboard paradigm** to a new way of consuming insights and sharing them across the companies.

DEEPENING

“By 2025, data stories will be the most widespread way of consuming analytics,” Sallam said. “Seventy-five percent of those stories will be automatically generated using augmented analytics techniques⁸.”

Decision Support Systems

Decision support systems (DSS) **are solutions designed to enable data consolidation from different and heterogeneous source systems into a unique server providing users the ability to query and monitor these sources through data analysis, KPIs and video flows.**

The **multi-touch tables**, in turn, are one of **potential channels in which DSS** can be delivered and it consists mainly in a **hardware component with adapted software** based on the Natural User Interface (NUI) paradigm to enable interactive **multi touch screen system** as tables & walls with **customized touchscreen software & object recognition technology.**

DEEPENING

KeyBiz is one of the high-tech companies developing advanced DSS solutions integrated with IoT devices providing hardware components adapted with NUI software development paradigm. The company designed multi-touch tables proposed specifically to sales and operations monitoring, war-rooms and rooms for crisis management in which users need dynamicity to dive into data and KPIs to better analyse challenges from multiple points of view. Below we present an example of Metamorphosis dashboard that is a KeyBiz DSS solution based on IoT devices and to monitor operations in real-time.



Figure 4 Multi Touch Table Example

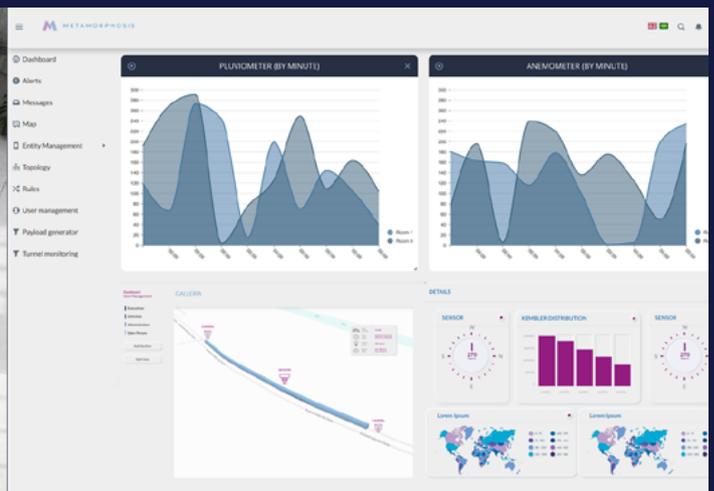


Figure 5 KeyBiz Metamorphosis DSS

Currently designed for single users, **with the large adoption of multi-touch tables** by enterprises, the **modern ABI platforms will have to include this capability in their range of products/functionalities** to play an important role in the **Next Generation of Decision Support Management**, strongly based on **data visualization** and **collaboration capabilities**

Where to start?

The old Business Intelligence has dramatically evolved in recent years, going beyond data monitoring in well-designed dashboards to enabling companies to boost adoption of edge data technologies across areas. The point here is whether people in companies are really ready to adopt edge data technologies and fully explore their capabilities in the Augmented Intelligence era.

At Bip, we understand that **this readiness is not a starting point, but a result from a transformation program.** Our approach to supporting companies towards ABI consists in the design of **use-case-driven evolutionary roadmaps** that will guide the enhancement of **BI platforms, data infrastructure and Users' culture and attitude.**

Bip xTech, our Center of Excellence in exponential technologies, can count on **BI experts, data strategists, data scientists and other data professionals** ready to support this **evolutionary path,** being able to help our clients from the standardization of reports and **development of main corporate dashboards** up to the **governance of an ABI program** and **the development of enhanced ABI solutions** through AI, ML and streaming analytics.

Disclaimer

In this article, some **products/vendors** have been mentioned **as examples to illustrate some advanced functionalities.** Bip, through our center of excellence in data technologies (**Bip xTech**), has **partnerships** with **many of these vendors** but, aligned with our vendor **independence strategy,** we maintain as **technology agnostic** and, therefore, we are able to **recommend the best solution** depending on the **client need,** leveraging on a group of **experts certified** in most of these technologies.

IF YOU NEED AN INSIGHT ON OUR END-TO-END OFFERING OR YOU WISH TO HAVE A CONVERSATION WITH ONE OF OUR EXPERTS, PLEASE FILL IN YOUR PERSONAL DATA AT THIS [LINK](#), AND YOU WILL BE CONTACTED SOON.

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