



Visa Consulting & Analytics (VCA)

Demystifying the analytics value chain

How financial institutions can
extract more value from data



Today, businesses across diverse industries are using advanced analytics to streamline their operations, enhance their product offering, and improve their customer experience. They have at their disposal a range of sophisticated tools and techniques which, in theory, can bring advanced analytics capabilities within the reach of any organization. Yet many still struggle to align the necessary people, processes, and technologies - which prevents them from realizing the promise of advanced analytics.

At Visa Consulting & Analytics (VCA), we think of analytics as a supply chain. We believe it is necessary to view advanced analytics as an integrated, end-to-end continuum, incorporating everything from, the initial data collection and ingestion, to the way data is analyzed, to the way the analysis is reported to the eventual application of new insights. We have developed a set of methodologies to guide decision-making and investments.

In this paper, we provide a framework to help financial institutions think through their own analytics supply chain and improve their capabilities.

What do we mean by advanced analytics?

Advanced Analytics is the autonomous or semi-autonomous examination of data or content using sophisticated techniques and tools, typically beyond those of traditional business intelligence (BI), to discover deeper insights, make predictions, or generate recommendations. Advanced analytic techniques include those such as data/text mining, machine learning, pattern matching, forecasting, visualization, semantic analysis, sentiment analysis, network and cluster analysis, multivariate statistics, graph analysis, simulation, complex event processing, and neural networks.¹



Gartner, Advanced Analytics, <https://www.gartner.com/en/information-technology/glossary/advanced-analytics>



Advanced analytics are everywhere



As consumers, we increasingly encounter advanced analytics in our everyday lives: when we talk to Alexa, we are conversing with Amazon's cloud-based artificial intelligence (AI) service; when we choose to watch a movie recommended by Netflix, we are acting on the conclusions of a powerful media recognition engine that uses collaborative filtering to personalize the options presented to us; when we rely on the advanced driver assistance capabilities of our car, we are putting our trust in object recognition technologies; when we engage with a chatbot, or take advantage of smart email composition, we are turning to AI to make our online lives quicker and easier.

These are just a few examples among very many - which means that, for many businesses, advanced analytics is well beyond the research and development (R&D) phase and has become embedded into the way they function.

In the financial services sector, some forward-looking institutions have been keeping pace. But others are only just beginning their advanced analytics journeys or, following some promising experimentation, are trying to build momentum. In the more competitive reaches of the market, implementing these techniques is not a matter of simply doing things more efficiently - but rather a critical survival mechanism.



The proliferation and democratization of analytics

The good news is that these days, no business needs to build everything from scratch.

Over recent years, the democratization of enabling technologies has led to a proliferation of new tools and solutions that can be implemented, off-the-shelf, and with minimal upfront cost or technical expertise. Meanwhile, the commoditization of analytics techniques has led to higher penetration of advanced analytics. For instance, several cloud providers have pre-trained models that can be used to run applications, which make implementation easier and faster, and bring about a virtuous cycle of more such models. For example, Azure ML from Microsoft offers machine learning as a service - enabling practically anyone to access highly sophisticated algorithms to train and score data via an easy-to-understand graphical user interface.

With the rapid advancement of cloud technologies, the prevalence of the software-as-a-service (SaaS) model, the availability of micro-services architecture, and the explosion of digital data, it seems as though every industry vertical is being reinvented. Looking at the current landscape, more than 1,000 players are providing solutions in different areas of analytics, and momentum continues to build. Since 2017, more than US\$50bn of funding has been poured into AI start-ups, with new solutions focused on niche areas like fraud, marketing, and customer engagement.²

Examples of new solutions coming to market across various functions include:



**Marketing, Loyalty,
Chat Bots, Social,
Personalization**

KASISTO
ABE
CARDLYTICS
CLEO
LEXALYTICS



**Robo Advising,
Credit Risk**

BETTERMENT
WEALTHFRONT
WORK FUSION
ZEST AI



**Fraud Management,
Regulatory
Compliance**

FEEDZAI
DARKTRACE
HEXANIKA



Cloud Technologies

AMAZON WEB SERVICES
AZURE
SALESFORCE EINSTEIN
SAP ANALYTICS CLOUD

Not surprisingly, investment in analytics is growing across almost all companies. In a 2021 survey of Fortune 1000 companies, 55 percent said they had already invested more than US\$50m in big data and AI projects, and nearly two-thirds of them said they had achieved notable results within the first year. Momentum was particularly strong among financial institutions - with 95 percent of them reporting that they were accelerating their spend on analytics capabilities, had narrowed their focus to appropriate applications, and had invested in the necessary talent, data, and underlying technologies.³

² CB Insights, AI In Numbers: Global Funding, Exits, And R&D Trends In Artificial Intelligence: <https://www.cbinsights.com/research/report/ai-in-numbers-q2-2019/>

³ Big Data and AI Executive Survey 2021, NewVantage Partners: <https://www.newvantage.com/thoughtleadership>



Three trends in driving investments in advanced analytics

From our work at VCA, we believe that there are three big trends driving investments in advanced analytics.

The decoupling of technology enabled by cloud-based platforms

Again, a good example here is the accessibility, relative affordability, and ease-of-use of tools like Azure ML

A determination to bring analytics to the point of decision making

This is not just boxed or canned Business Intelligence (BI) or insights living within an exclusive team of analysts

An increased focus on AI

It is simply not enough to stop at the insights - things need to be taken further with a prescription mindset

How should financial institutions accelerate their advanced analytics journey?

By now, almost every financial institution will understand the type of value that advanced analytics can bring. So, rather than looking for a rationale to invest, they are typically a step ahead - and are focused on how best to accelerate their analytics journey, in a way that will move the dial quickly, while building for sustainable future growth and competitiveness.

The answer is not simply to deploy a set of tools or form an analytics team. Instead, there must be a well-orchestrated data, technology, and talent strategy. But, more fundamentally, financial institutions should ask themselves two key questions:

1 How can analytics help accelerate our business growth, increase our customer lifetime value, or drive more efficiency in our operations?

For example, can better data help us target the right markets and customer segments? Could we proactively engage with those customers with the highest risk of attrition? And could we save costs by realizing synergies between different functional areas?

2 What building blocks are necessary to unleash new insights and influence the most granular business decisions?

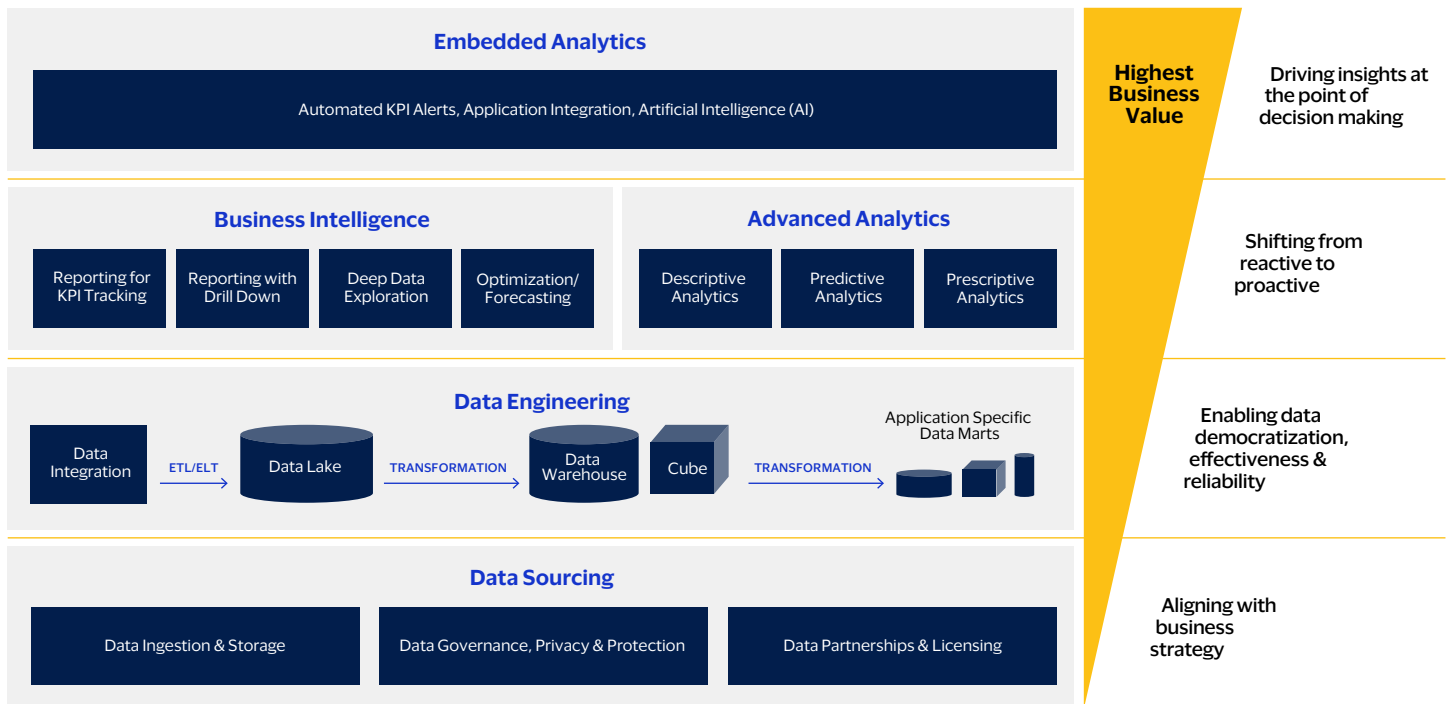
For example, which data elements should we source? How can we transform this data into insights that help our business managers? And how do we move the organization from reactive to proactive business management?

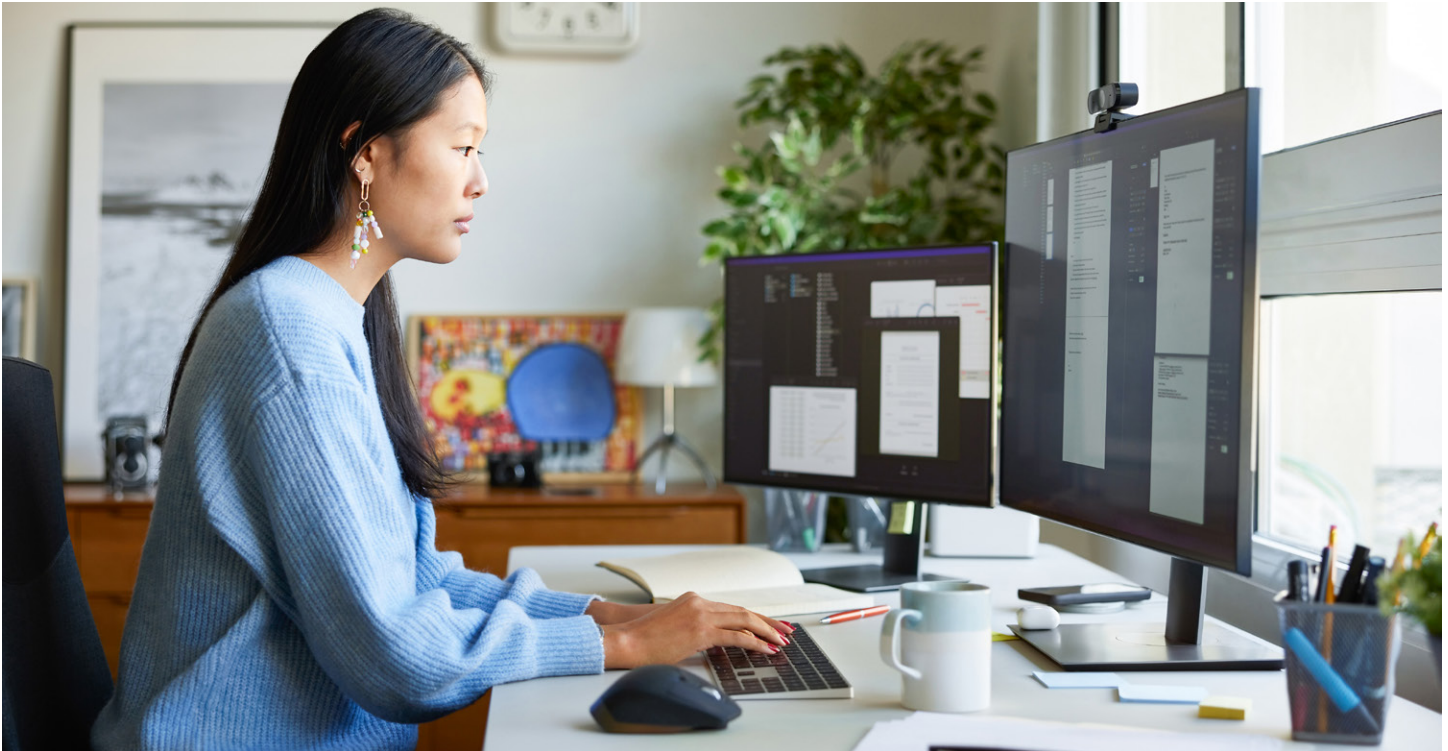


A comprehensive framework to support analytics investment decisions

To provide some structure to the decision-making process, and help stakeholders understand the interconnections within the supply chain and the significance of various building blocks, we use the following framework:

A purposeful analytics strategy is critical to maximize the benefits to the enterprise





Analytics Stack	Core Elements	Business Value Drivers
EMBEDDED ANALYTICS	<ul style="list-style-type: none"> • KPI Automation • Application Integration • Artificial Integration 	Highest business value capture
ADVANCED ANALYTICS	<ul style="list-style-type: none"> • Predictive Analytics • Prescriptive Analytics 	Shifting from reactive to proactive
BUSINESS INTELLIGENCE	<ul style="list-style-type: none"> • Reporting for KPI Tracking • Data Exploration • Optimization • Forecasting 	Driving timely insights to the point of decision making to influence action
DATA ENGINEERING	<ul style="list-style-type: none"> • Data Integration • Transformation (ETL/ELT) • Data Access (Data warehouse, data mart, data cube) 	Enabling data democratization, effectiveness & reliability
DATA SOURCING	<ul style="list-style-type: none"> • Data Ingestion & Storage • Data Governance, Privacy & Protection • Data Partnerships & Licensing 	Foundational layer aligned with business strategy



Data Sourcing

The foundational layer of analytics supply chain is data sourcing. Knowing which data is required to support our business strategy, coupled with a plan to access that data is crucial. Data accessibility has a direct impact on technology architecture, and it is important to realize that financial institutions may need to rely on technology partners. Finally, it is critical to consider the growing risk of data breaches and misuse of data - meaning that strong governance needs to be embedded into data strategies.

Data Engineering

This layer is often combined with Data Strategy layer, but warrants its own focus given the need for a specific skill set. Data Engineering is all about transforming data so it can be consumed by multiple, diverse analytics engines or even applications that rely on data (e.g. data APIs). It sits at the heart of an efficient analytics supply chain, and any underinvestment in data engineering technology or talent can severely restrict the return on investment from analytics.

Business Intelligence & Advanced Analytics

This layer probably resonates most with financial institutions, as some of the tools are already popular among business teams and directly connected with insights that drive the business. Even within this layer, there are several nuances that must be considered, as they can have the power to determine the overarching business outcome.

Of course, the Business Intelligence component has become a table-stakes requirement, but there is still strong potential to provide additional data exploration capabilities and empower business teams.

The shift to Advanced Analytics is happening rapidly, and this is where true data science capabilities must be deployed. Predictive analytics has also experienced rapid growth thanks to open-source programs. Meanwhile, prescriptive analytics is also gathering strong momentum, which is where business knowledge becomes key. A relatively new field which directly supports AI is cognitive analytics - which is particularly relevant for businesses that generate significant volumes of unstructured data (mostly in the B2C space).

Embedded Analytics

The concept of Embedded Analytics is not new. Simply put, it is the ability to provide insights at the time (and point) of decision-making. With the momentum in cloud technologies, micro-services architecture, and AI, this Embedded Analytics layer represents the next frontier for companies in increasing their analytics return on investment (ROI).

This analytics supply chain framework is foundational, as it helps financial institutions to make key decisions across three areas:



The talent and operating models - the people and processes required for teams to work collaboratively and deliver outcomes



The technology strategy - an assessment of existing technology gaps, the definition of future requirements, and a roadmap for the provision of the technology that is required to achieve the use cases envisioned

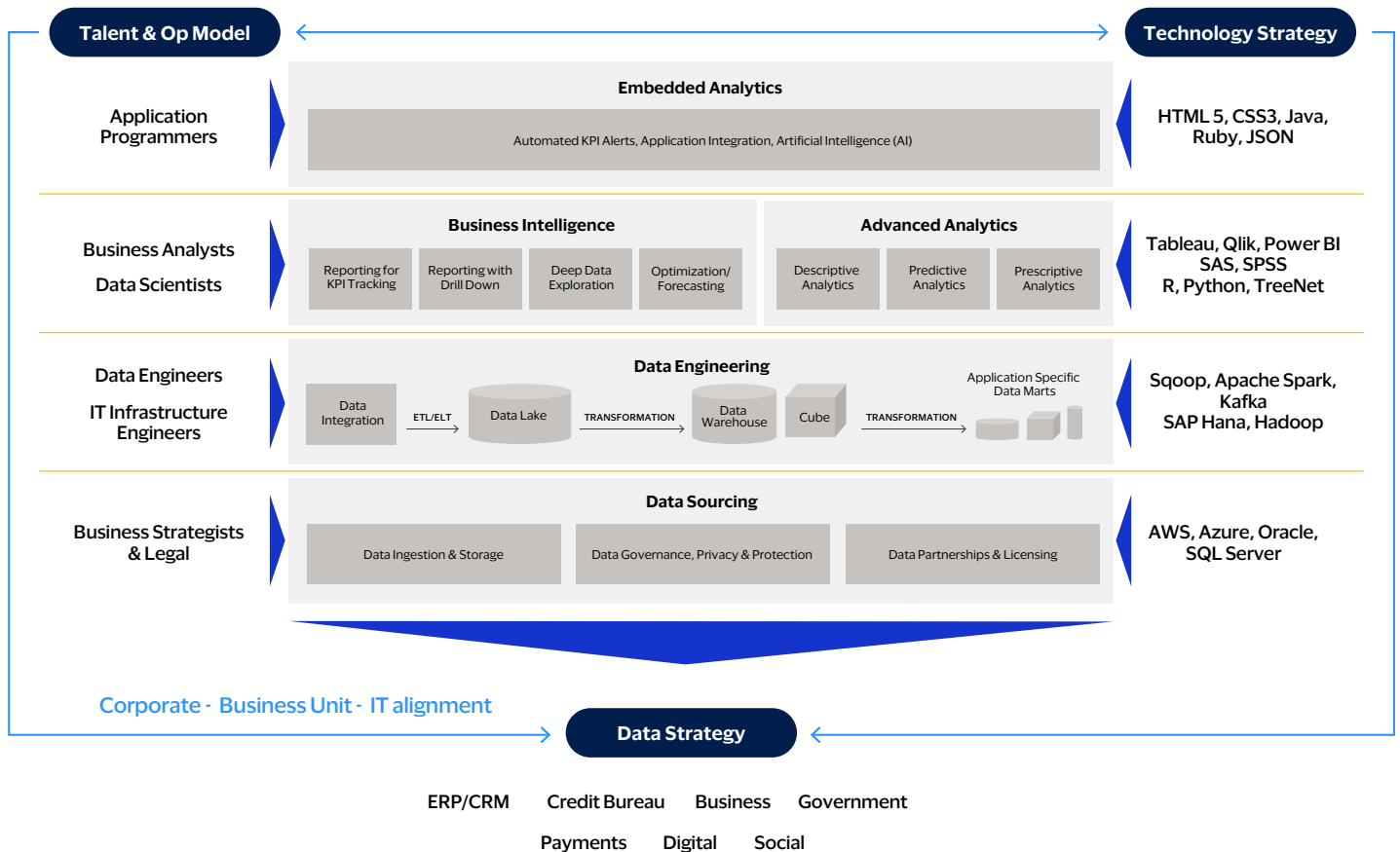


Data strategy - the process of evaluating data sources, starting from the use cases of the analytics



To enable financial institutions to realize the true potential of advanced analytics, an objective assessment of the entire analytics supply chain should focus on technology, talent and an operating model. The proposed framework can also provide guidance when making build vs. buy vs. partner decisions (i.e., it may be desirable to enter strategic partnerships to accelerate the analytics journey).

Transformation to a data-driven organization



In developing the framework and our methodologies, VCA draws on Visa's deep and long-standing expertise in data engineering, advanced analytics, and strategy, and we can be a valuable partner in accelerating your analytics journey. Over recent years, we have developed incredible data assets through payments and industry partnerships and have hands-on experience deploying them to solve the toughest business problems for banking and retail clients.





Analytics Stack	Talent Profile	Technology Requirements
EMBEDDED ANALYTICS	<ul style="list-style-type: none"> • Application Programmers 	HTML 5, CSS3, Java, Ruby, JSON
ADVANCED ANALYTICS	<ul style="list-style-type: none"> • Data Scientists • Statisticians 	R, Python, TreeNet
BUSINESS INTELLIGENCE	<ul style="list-style-type: none"> • Business Analysts • Visualization Specialists • Data Scientists 	Tableau, Qlik, Power BI SAS, SPSS
DATA ENGINEERING	<ul style="list-style-type: none"> • Data Engineers • Infrastructure Engineers 	Sqoop, Apache Spark, Kafka SAP Hana, Hadoop
DATA SOURCING	<ul style="list-style-type: none"> • Business Strategists • Legal & Compliance Specialists • IT (Infrastructure, Cybersecurity) 	AWS, Azure, Oracle, SQL Server

Data-driven Culture





About Visa Consulting & Analytics

We are a global team of hundreds of payments consultants, data scientists and economists across six continents.

- Our consultants are experts in strategy, product, portfolio management, risk, digital and more with decades of experience in the payments industry.
- Our data scientists are experts in statistics, advanced analytics and machine learning with exclusive access to insights from VisaNet, one of the largest payment networks in the world.
- Our economists understand economic conditions impacting consumer spending and provide unique and timely insights into global spending trends.

The combination of our deep payments consulting expertise, our economic intelligence and our breadth of data allows us to identify actionable insights and recommendations that drive better business decisions.

For help addressing any of the questions raised in this paper, please reach out to your Visa Account Executive to schedule time with our Visa Consulting & Analytics team or send an email to VCA@Visa.com or visit us at Visa.com/VCA

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