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Analytics in banking:
Time to realize the value

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Analytics in banking: Time to realize the value

By establishing analytics as a true business discipline, banks can grasp the enormous potential.

Consider three recent examples of the power of analytics in banking:

- To counter a shrinking customer base, a European bank tried a number of retention techniques focusing on inactive customers, but without significant results. Then it turned to machine-learning algorithms that predict which currently active customers are likely to reduce their business with the bank. This new understanding gave rise to a targeted campaign that reduced churn by 15 percent.

- A US bank used machine learning to study the discounts its private bankers were offering to customers. Bankers claimed that they offered them only to valuable ones and more than made up for them with other, high-margin business. The analytics showed something different: patterns of unnecessary discounts that could easily be corrected. After the unit adopted the changes, revenues rose by 8 percent within a few months.

- A top consumer bank in Asia enjoyed a large market share but lagged behind its competitors in products per customer. It used advanced analytics to explore several sets of big data: customer demographics and key characteristics, products held, credit-card statements, transaction and point-of-sale data, online and mobile transfers and payments, and credit-bureau data. The bank discovered unsuspected similarities that allowed it to define 15,000 microsegments in its customer base. It then built a next-product-to-buy model that increased the likelihood to buy three times over.

Results like these are the good news about analytics. But they are also the bad news. While many such projects generate eye-popping returns on investment, banks find it difficult to scale them up; the financial impact from even several great analytics efforts is often insignificant for the enterprise P&L. Some executives are even concluding that while analytics may be a welcome addition to certain activities, the difficulties in scaling it up mean that, at best, it will be only a sideline to the traditional businesses of financing, investments, and transactions and payments.

In our view, that's shortsighted. Analytics can involve much more than just a set of discrete projects. If banks put their considerable strategic and organizational muscle into analytics, it can and should become a true business discipline. Business leaders today may only faintly remember what banking was like before marketing and sales, for example, became a business discipline, sometime in the 1970s. They can more easily recall the days when information technology was just six guys in the basement with an IBM mainframe. A look around banks today—at all the businesses and processes powered by extraordinary IT—is a strong reminder of the way a new discipline can radically reshape the old patterns of work. Analytics has that potential.

Why? Three factors are coming together to kick off the coming heyday. First, consider *advances in technologies*. The availability of information is booming: in the past few years, the amount of meaningful data—true signal, not noise—has grown exponentially, while the size and cost

of processors decreased. By 2020, about 1.7 megabytes a second of new information will be created for every human being on the planet. Businesses have opened their minds, freely adapting new analytical techniques that in the past might have been dismissed as too impractical and theoretical for the real world.

And those techniques have improved radically. We are well past simple linear regressions—machine learning now features support vector machines, random forests, gradient boosting, and many other astonishing algorithms. Any company's ability to perform these analytics has been significantly boosted by the exponential increase of computing power (which makes it possible to undertake, in just seconds, an analysis that in the past would have taken weeks) and by new data-storage technologies, such as Hadoop.

Second, banks in many regions are under *enormous economic pressure*. Our latest research finds that of the top 500 institutions around the world, 54 percent are priced below book value. In 2014 we calculated that just 18 percent of banks captured all the value in the industry. Recognizing this reality, banks have tried all manner of improvements, especially digitization and cost cutting. But these moves have taken them only so far; something new is needed.

Those *digitization* efforts underlie the third factor pushing analytics. Much of a typical bank is now digitized and throwing off data by the terabyte. A mostly manual bank would have serious difficulty using advanced analytics; at digital banks, the highways are already paved.

Put it all together, and you get advanced analytics: industrial-scale solutions to exploit data for authentic business insights and vastly improved decision making. The tools are there; banks must now carry them forward into actions that can drive meaningful change. The canvas is as broad as a bank itself. Rich real-time data—numbers, yes, but also text, voice, and images—now exist for literally every action that customers make, every product that banks sell, and every process that banks use to deliver those products. In this article, we will explore the vast opportunities, as well as the problems of integration and scaling that keep banks from making analytics a coherent discipline. We will then suggest the strategic and organizational elements that banks need to realize the analytics dream.

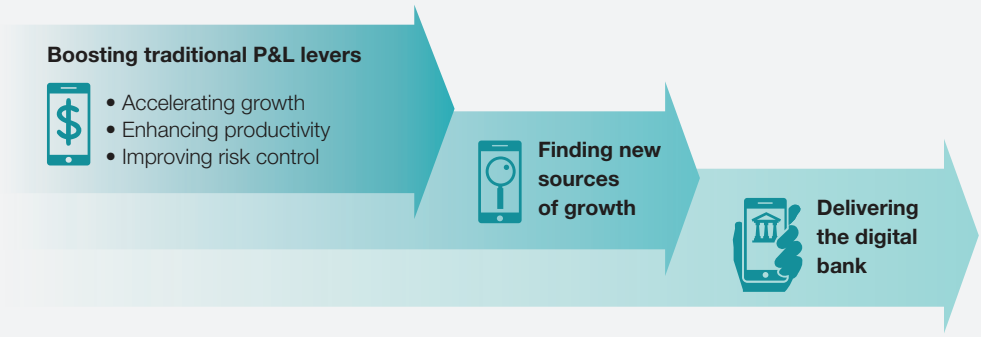
Ready for prime time

As the saying goes, "The future is already here. It's just not evenly distributed." Banks—and companies in every other industry—are already deploying advanced analytics to move their businesses forward. We see three ways it can generate a meaningful increase in profits (Exhibit 1).

- Advanced analytics can help banks wring small improvements out of almost all their everyday activities, boosting the traditional P&L levers. Potential moves include the following:

  — *Accelerating growth, even in an anemic environment.* Deeper and more detailed profiles of customers, together with transactional and trading analytics, can improve the acquisition and retention of clients, as well as cross- and upselling. For example, one bank used credit-card transactional data (from both its own terminals and those of other banks) to develop offers that gave customers incentives to make regular purchases from one of the bank's merchants. This boosted the bank's commissions, added revenue for its merchants, and provided more value to the customer.

Exhibit 1 **Three ways advanced analytics can generate an increase in profits.**



— *Enhancing productivity.* Every banking process can become faster and more effective. Among other things, banks can use advanced analytics to provide faster and more accurate responses to regulatory requests and give teams analytics-enhanced decision support. One bank we know used machine learning to understand the way the characteristics of code affected a mainframe's running time and the resulting costs; by optimizing the code, it cut them by 15 percent. Another bank used new algorithms to predict the cash required at each of its ATMs across the country, combining this with route-optimization techniques to save money.

— *Improving risk control.* Banks can lower their risk costs through analytics-aided techniques, such as digital credit assessment, advanced early-warning systems, next-generation stress testing, and credit-collection analytics. The expense of compliance and control has soared in recent years, and banks can use analytics to get economic returns from their considerable investments. We estimate that G-SIBs can take out up to $1 billion a year in costs through a simplified portfolio of data repositories—building on work that most banks have already done—and through new analytics that produce more accurate regulatory reports and deliver them more quickly. D-SIBs can save up to $400 million annually. Further out, banks will be able to use analytics to reduce fraud losses.

- A second vector of impact is the way that analytics can help *deliver the promise of digital banks* and offer a much better customer experience at a fraction of the current cost. In some regions up to 65 percent of customers now interact with their banks via multiple channels. Their paths through them are extraordinarily complex: they often start in one channel, perform intermediate steps in others, and finish in yet another—with plenty of pauses and information-gathering loops along the way. Successful digital banks deliver a truly seamless multichannel experience by

gathering real-time data and using analytics to understand the customer and build the proper (and always consistent) journey view.

- Finally, analytics can help banks *find new sources of growth*, and even new business models. Banks may be able to reap income from their data—for example, by sharing customer-analytics capabilities with new ecosystem partners, such as telecom companies or retailers. Taken to a logical but not implausible extreme, banks can use data and analytics to shape a new business model and out-fintech the fintechs. The bank as data company can sit at the center of a consumer ecosystem where the revenue pools include not just banking but also many other B2C and B2B businesses. Great analytics isn't the only requirement here: banks must get many other things right to be relevant to and trusted by customers. But that can be done, and already more than a dozen leading banks are taking positive steps in this direction.

Not without pitfalls

In our recent survey,[1] we found that almost every bank lists advanced analytics among its top five priorities. Most plan to invest further in these techniques. A few banks are already seeing the rewards. These leaders have built substantial foundations by establishing data lakes and centers of excellence and using machine-learning techniques. They and many others have spent hundreds of millions on their data (especially risk data) and on compliance. For them, advanced analytics is becoming a reflex action, with commensurate rewards of about €300 million in additional annual profit, on average.

Most banks we surveyed, however, are struggling. A good many are "started but stuck": they have invested significantly in data infrastructure (mostly as a result of regulation) and experimented with advanced-analytics techniques (mostly through specialized teams loosely connected to the corporate center). But the expected results have not arrived. A few banks have yet to begin.

The started-but-stuck ones are running into a number of problems. At the highest level, their efforts remain unconnected and subscale; they have not yet tied together their disparate efforts into a single, unified business discipline. Tactically, we see banks making unforced errors such as these:

- not quantifying the potential of analytics at a detailed level
- not engaging business leaders early and to develop models that really solve their problems and that they trust and will use—not a "black box"
- falling into the "pilot trap": continually trying new experiments but not following through by fully industrializing and adopting them
- investing too much up front in data infrastructure and data quality, without a clear view of the planned use or the expected returns
- not seeking cooperation from businesses that protect rather than share their data
- undershooting the potential—some banks just put a technical infrastructure in place and hire some data scientists, and then execute analytics on a project-by-project basis
- not asking the right questions, so algorithms don't deliver actionable insights

Making it happen

Avoiding the pitfalls and accessing the broad set of opportunities requires CEO leadership as banks develop two assets: a strategy for the

transformation and a robust analytics organization to assist and empower the businesses as they learn to use analytics in their everyday work. (New technologies and tools are also necessary; see sidebar, "A quick take on the CIO agenda.")

Readers may notice something that's missing from this list: setting the aspiration. That's because we think every institution, unless its circumstances are extraordinary, should set the same aspiration: to establish analytics as a business discipline—the

A quick take on the CIO agenda

As noted, analytics does not necessarily require a big investment in IT. But banks must provide the technologies and tools that businesses need to access an immense set of high-quality data in real time. That data must be well managed and always available. These technologies include the following:

- *Data lakes* to scale up and industrialize the development and delivery of use cases. There are good and bad ways to use data lakes; we've seen better results when they are developed with agile techniques based on use cases. At all costs, banks should avoid building another enterprise data warehouse or asking data lakes to do more than they really can. Data lakes will not unburden the banks from proper governance and quality-assurance processes, but they do offer an opportunity to get things right from the beginning.
- *Machine-learning techniques,* which have proved superior in many use cases—the industry will inevitably move toward machine learning supported by open-source languages. Machine-learning tools are already available in most banks but are not used to solve very specific problems. (If they are not available, there is a large market of rapidly moving open-source technologies and commercial software products.) Banks need to keep their options open to the vast innovations taking place in machine learning.
- *Google-like search engines* provide quick and easy access to all of a bank's data, including the source, definition, and all other information needed to use the data effectively.
- *Modern data-exploration and -visualization tools* are helpful to bridge the gap between advanced business users identifying potential use cases, anomalies, or patterns in the data, on the one hand, and data scientists using advanced analytics to predict and optimize, on the other.
- *Tools to analyze text, voice, video, and images* can help to process new data structures—specifically, unstructured data, such as voice and text. For example, analyzing live-chat data has great business potential for retaining customers or for next-best-product-to-buy analyses.
- *Capabilities to leverage real-time data* are important. Deploying analytical models in live streams can help embed analytical advice and predictions into customer dialogues. For example, most banks have already added chat capabilities to call centers. Now, banks can add analytics-driven recommendations to the APIs that support chat to insert a "next best" suggestion to customers.

go-to tool for the thousands of decision makers across the bank. Earlier we mentioned analytics as a reflex. To extend the metaphor, analytics should resemble the human nervous system; every part of the body knows what to do when presented with certain stimuli. The big difference among banks will probably be the pace at which they can build and train their systems. Just as some parts of your brain are trained and some are not, banks will find that some nerve paths are already working well, while others must be laid down and taught how to react.

There's something else missing from our list of required assets: an additional $100 million or so of spending. Many bank leaders look at analytics and fear an outsized investment. That's not unreasonable, since in recent years institutions have had to spend billions on things they could not have anticipated, and budgets are very thin. But analytics is not a bet-the-bank investment with no graceful exits; it's a short-cycle flow of investments with lots of options to kill unsuccessful pilots. The small but immediate payoffs from the initial work can finance the next wave of projects, which in turn finance more and larger efforts. Once the system is built, the investment is over and the margins become enormous—like those of software or tech companies.

A clear strategy centered on high-priority applications

Three elements are essential to the strategy. First, banks need an *analytics-ready mind-set*. Analytics transforms everyday work in surprising ways, so leaders must open their minds to the possibilities. Our core beliefs about advanced analytics can help.[2]

- *Great analytics starts with high-value questions, not data.* To guide the discovery process, ask what problem you want to solve and how much value the solution can create. Do not launch yourself into analysis for the sake of analysis or into intellectually interesting problems whose solutions are not actionable.

- *The smallest edge can make the biggest difference.* Advanced analytics is not about solving your biggest problems; it's about solving hundreds of small ones that all add up. Especially in operations, these techniques can help to redefine processes and shorten them by several steps.

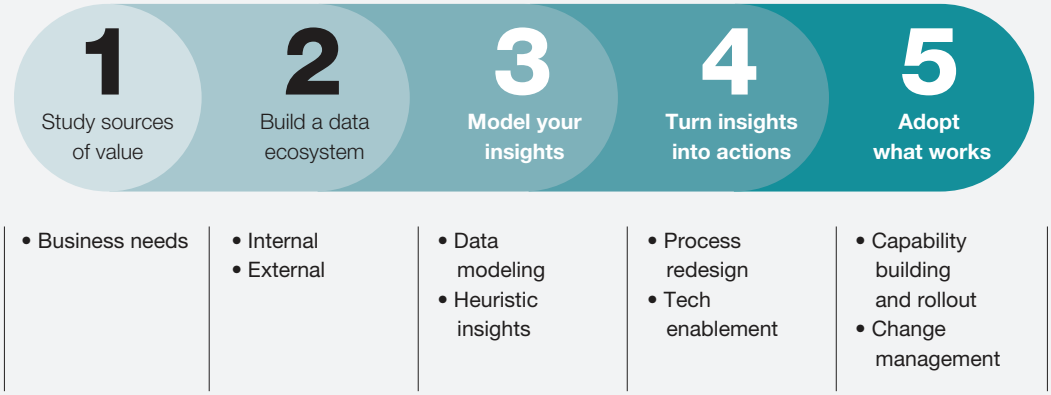
- *Insights live at the boundaries between data sets.* Remember the bank that combined six or seven discrete data sets to build a tool predicting the next product to buy? It realized that lots of relationships become apparent only when it compared widely varying parameters. Banks have massive amounts of data scattered through different departments. Pilots to bring together small samples of information can reveal the potential.

- *Loops beat lines every time.* Following a process can be a slog, and to do so you sometimes have to put on blinders. But that mentality is exactly wrong for advanced analytics. Banks that use feedback loops can not only be faster to market than competitors but also arrive there with better products. Ultimately, machines learn just as we do: by trial and error.

- *Design matters.* You want people to use your new tools. A beautiful algorithm deserves an attractive package that catches the eye of your users. Most of them can't read code or understand the output of a model. To act on these insights, they need easily readied and used dashboards that help them make decisions and test potential scenarios.

Exhibit 2 **Ensuring impact has five prerequisites.**

An ordered approach to data-analytic enlightenment



- *Analytics isn't enough; adoption is essential.* Use whatever means necessary—incentives, role modeling, communication, more communication—to get decision makers to use the new tools. Way too often, best-in-class algorithms sit idle in computers because users do not trust what they regard as a black box, fear the impact it could have on their roles, or simply do not want to go through the discomfort of change. Creating analytics is like putting jet fuel in your car. At the end of the day, if the driver does not develop the skills needed to drive faster, the effort is wasted.

- *Analytics is a team sport.* The skills banks need to make analytics work cannot be contained within a single person—at least not yet. Your teams must include true experts on data science, engineering, data architecture, and design. Faking it with people who do a little bit of everything won't work.

A second element of the strategy is *a set of prioritized use cases* and a mechanism to create a pipeline of them. The scope for analytics is vast. Anywhere a bank uses rules of thumb or something is done "the way we've always done it," analytics can probably make improvements. The CEO must lead the hunt for these issues and help prioritize them. Critically, at the beginning, the chosen use cases should not be limited to applications in which analytics could produce a substantial uptick in results; they should also include areas where scale can be increased quickly, to avoid the "pilot trap."

Most of the potential use cases are relevant to every banking business. They include commercial applications: cross-selling and upselling, customer acquisition, reducing churn, and winning back customers. Business-improvement levers (such as dynamic and value pricing, credit underwriting, sales-area planning, yield and claims management, fraud detection, call-center routing, and workforce

planning) are also relevant for most banks. While the first couple of use cases can be introduced top-down or outside-in, it is just as important to encourage everybody in the bank to become creative and make suggestions—while always ensuring a clear path to creating value. To avoid discouragement, long validation and delivery cycles need to be shortened. Innovation labs can help accelerate the process.

Finally, a strategy should set out a vision for how the bank will use analytics applications. For each use case the bank is considering, it should start by asking what problem holds back the business from having a greater impact. It can then work through a set of five steps: identifying the source of value, considering the available data (easier to do with a data lake, as we describe in the sidebar), identifying the analytics technique that will respond to the problem and probably produce insights, considering how to integrate analytics into the workflow of the business, and anticipating the problems of adoption (Exhibit 2).

Will sellers use the tools? If not, why not? What are their needs, and how can you make the analytical tools responsive to them? Sometimes the answer involves bundling insights from algorithms with useful data for sales managers in an app that they can use on external visits. Other times, a bank will have to change the way it develops campaigns and pushes them to the front line and to customers. Finally, in many other cases the bank will have to develop a group of high-performing champions who embrace this discipline and act as role models.

Embedding analytics in the organization is not simply a matter of getting specific teams to use specific tools, though that's essential. The CEO and the top team must do much more to communicate clearly that analytics is important to the bank and empower everyone to join the revolution. The classical steps of successful change management will be essential: role modeling the new behavior, clearly explaining why change is needed, building the skills of the businesses so they can succeed with the new tools, and reinforcing the bank's commitment through formal mechanisms (such as incentives).[3]

A powerful analytics network

The businesses will need help to design analytics systems, to build applications exploiting them, and to promote adoption. Banks will want to establish a central team that supports these needs. But the last thing they should do is build another silo. What they require is a networked structure, a kind of nervous system. More than anything, banks must have open channels and accessibility to make a knowledge of analytics pass freely throughout the enterprise. An analytics center of excellence, the spine of such a system, will probably need some or all of the following components:

- *New roles and responsibilities* in data management, advanced analytics, and campaign execution. Perhaps the most critical role is that of a chief data officer responsible not only for analytics strategy and its integration into business units but also for defining data management's roles and responsibilities, monitoring the quality of data, and ensuring regulatory compliance.

- *Imaginative channels,* such as innovation labs, to bring analytics closer to users.

- *A deep pipeline of analytics talent,* cited as a top priority by 60 percent of the banks in our recent survey. Banks should typically start with small teams of data scientists, who can work with external partners to absorb the necessary competences and skills, and then scale up gradually.

- *A clear governance plan* with a strong center of excellence (headed by the chief data officer) and well-defined responsibilities for the governance and quality of data and for the execution of analytics within the businesses.

- *"Gold standard" data-management processes* that define clear accountability, maintain the quality of data, and manage metadata, the data life cycle, and controls.

- *Bulletproof data-quality controls,* starting at the very beginning of the data life cycle. They should be automated wherever possible and monitored by a set of key quality indicators, so that the businesses are accountable for collecting the right data.

More than 90 percent of the top 50 banks around the world are using advanced analytics. Most are having one-off successes but can't scale up. Nonetheless, some leaders are emerging. Such banks invest in talent through graduate programs. They partner with firms that specialize in analytics and have committed themselves to making strategic investments to bolster their analytics capabilities. Within a couple of years, these leaders may be able develop a critical advantage. Where they go, others must follow—and the sooner the better because success will come, more than anything else, from real-world experience.

[1] We interviewed executives at 13 global and regional banks based in ten countries across Europe and the Middle East.

[2] For more, see Helen Mayhew, Tamim Saleh, and Simon Williams, "Making data analytics work for you—instead of the other way around," *McKinsey Quarterly*, October 2016, McKinsey.com.

[3] See Tessa Basford and Bill Schaninger, "The four building blocks of change," *McKinsey Quarterly*, April 2016, McKinsey.com.

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