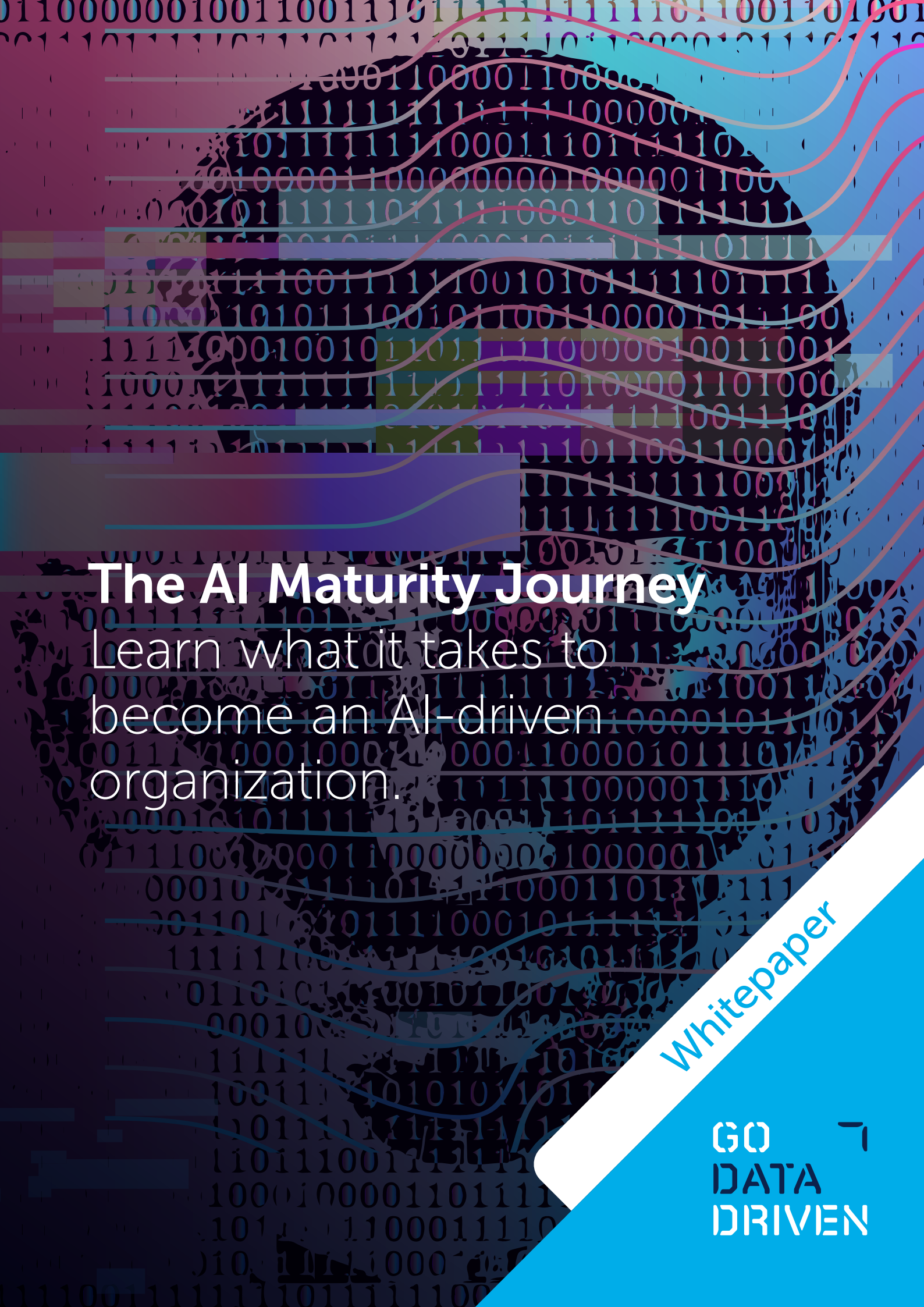

The AI Maturity Journey

Learn what it takes to become an AI-driven organization.

Whitepaper

GO DATA DRIVEN

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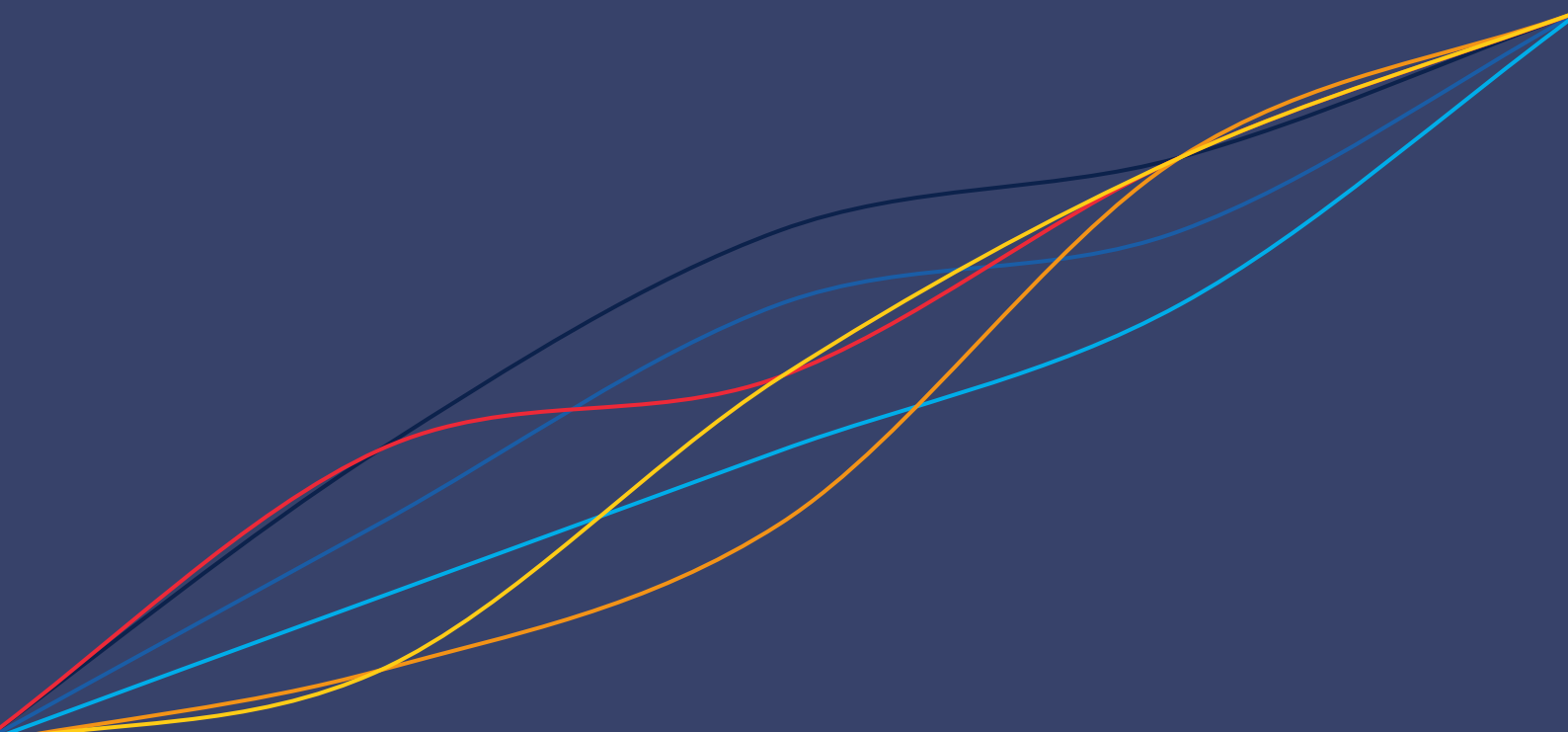


_ WHY MATURITY MATTERS

Introduction

Buzzwords like Big Data, Cloud, and Artificial Intelligence (AI) have been around for quite some time. Today, about 80% of companies consider data an essential part of their strategy (according to our annual Data & AI Survey[1]). However, only 15 out of 100 companies actually succeed in developing AI applications that are adopted and used by the business. With businesses heavily invested in data and AI, what actually makes the difference to be successful with AI?

This is exactly where a maturity model comes into play. The goal of such a model is to help businesses understand their current and target competencies, and helps organizations define a roadmap to improve their competency. A maturity model is therefore one way of structuring progression, whether the company already embraces data science as a core competency, or whether it is just getting started.

Maturity is the state of being fully developed. That's easy enough when you're talking about a perfectly ripe peach. However, maturity in humans or businesses is not as easy to accomplish or achieve. An organization can be mature in different areas, for example in regard to people, processes or technology. In addition, the definition of being 'fully developed' is subjective and might evolve over time as the world changes—and new technologies are introduced. Nonetheless, having an idea of what maturity looks like in a particular discipline will help you measure your organization's ability on that front.

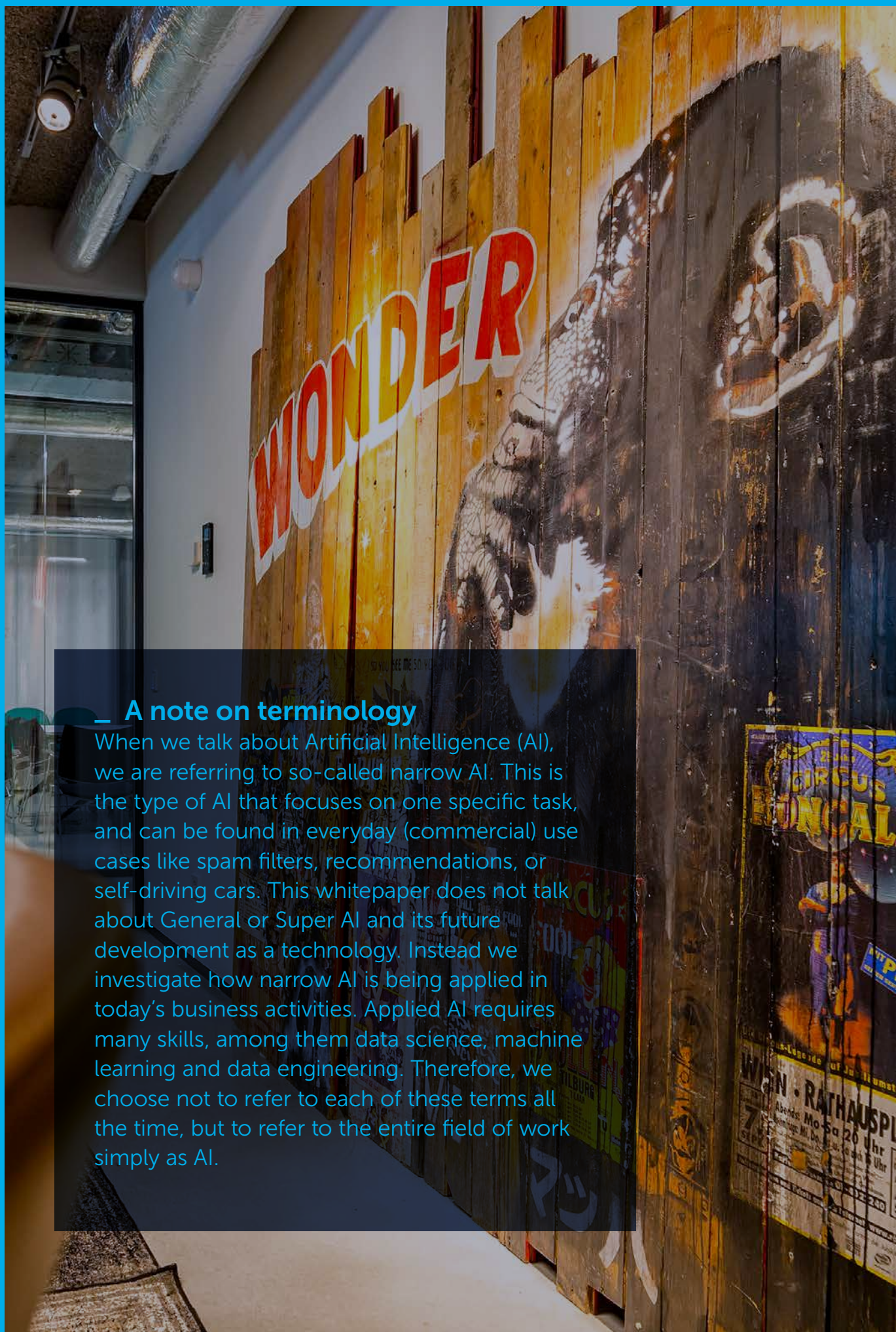
In this whitepaper on AI maturity, we answer the following questions:

1) **What exactly is a maturity model and why do you need it?**
   We address this by outlining a typical AI maturity journey and its constituent phases, based on interviews with top Dutch enterprises and our own experience as consultants.
2) **How can you use a maturity model to advance your organization?**
   Having a maturity model alone is not enough; to be valuable, you need to act upon it. Building on practical stories and experiences from our clients and ourselves we give guidelines on how to develop your analytical capability and how to embed AI in your organization.

All the findings presented in this paper come from our own experience as consultants and from interviews with business leaders from leading Dutch enterprises about their AI maturity journeys. Interestingly, the lessons learned along the way are generic across industries and domains.

With this whitepaper, we hope to give you an insight into the different stages of maturity. We hope this helps you progress to the next level. Happy reading!

[1] Link to 2019's Data & AI Survey: https://godatadriven.com/topic/data-ai-survey-2019-20/



_ A note on terminology

When we talk about Artificial Intelligence (AI), we are referring to so-called narrow AI. This is the type of AI that focuses on one specific task, and can be found in everyday (commercial) use cases like spam filters, recommendations, or self-driving cars. This whitepaper does not talk about General or Super AI and its future development as a technology. Instead we investigate how narrow AI is being applied in today's business activities. Applied AI requires many skills, among them data science, machine learning and data engineering. Therefore, we choose not to refer to each of these terms all the time, but to refer to the entire field of work simply as AI.

_ THE TWO AXES AND FOUR STAGES OF AI MATURITY

The AI Maturity Journey

The AI Maturity Journey reflects the typical phases that companies go through along the road to development. The first stage corresponds to little or no capabilities, while the final stage represents total maturity. This path to maturity can be used as a tool to help people and businesses assess their current state. Moreover, it can support them in understanding what capabilities they must acquire to progress to the next level of maturity.

The journey towards an AI-Driven organization moves through four maturity levels. These maturity levels can be assessed along two main axes: **Analytical Capability and Business Adoption**.

_ Analytical Capability

The analytical capability of an organization is reflected by the level of three elements: data, people and technology. Many organizations have initiated the development of their analytical capabilities by investing in data lakes and recruiting data scientists. Organizations with a more mature analytical capability have their data easily accessible, so that the in-house teams of experts can productionize and maintain models efficiently.

Analytical Capability Indicators

» **Data:** How is data organized and made accessible for use in analytical products?
» **People & Skills:** To what extent does the organization nurture internal talent?
» **Tools & Technology:** Do the technology stack and tools support AI innovation?

_ Business Adoption

The second axis, business adoption, describes to what extent AI has been embedded in an organization. It can be measured by three components: executive support, funding and implementation practices. For example, at more mature enterprises, AI innovation is sponsored by C-level board members, while the funding for smart products comes from business lines that are convinced of the business case and its return on investment (ROI). Mature companies typically take ownership of the AI implementation process by facilitating the required process redesign. In more immature organizations, AI competencies are typically isolated from the rest of the organization and people still look for proof of value first.

Business Adoption Indicators

» **Executive support:** Who is pushing for AI and leading the change?
» **Funding:** Who's paying for your AI initiatives?
» **Implementation:** When and how is the business engaged in AI initiatives?

_ Four Stages of AI Maturity

By comparing an organization's levels of analytical capability and business adoption, four phases of AI maturity become visible. Each of these phases comes with distinct challenges and requires a different focus.

From immature to mature, we recognize the following phases:

1) Initialization:
Companies in this phase are typically very new to AI. Data and smart algorithms have usually already been recognized as possible game-changers. Due to a lack of awareness and insufficient knowledge of what to invest in and how to do so, organizations in this phase find it hard to start developing their internal data competencies. Enterprise-wide opportunities have typically not yet been identified, but usually a single sponsor has invested in the launch of a first initiative to prove the added value of AI for the organization. The focus lies on producing results as quickly as possible; data, people and technology are brought together for just this one goal only. As competencies and experience are not yet available in-house, the people involved in these early-stage initiatives are often external consultants.

2) Continuous Experimentation:
In this phase, the focus shifts to building up a sustainable Analytical Capability. In-house talent needs to be recruited, and a robust infrastructure

	Initialization	Continuous Experimentation	Enterprise Empowerment	AI Democratization
State	Find and initiate first use cases: identify opportunities, boot up data, people and tools	Expand team and infra-structure while the number of AI products implemented increases	Grow AI practice across all business units and put business in driver's seat; buy-in required!	AI literacy in genes of company; everyone has skills required to make AI-driven decisions
Focus	Proofing value	Capability building	Business adoption	Enabling self-service
Questions	"Can we do it?", "How hard is it?", "Where are the opportunities?"	"How to organize?", "What skills and tech is needed?", "How do i repeat and scale?"	"How to involve the business?", "Who is paying for new and matured use cases?"	"How to support AI driven decision making across the organization?", "How to measure everything?"
People affected	Handful of specialists pioneering in isolation	Growing team that is slowly expanding reach	Each domain has its own AI specialists	The entire company eats, sleeps and breaths AI

Figure 1: The four AI maturity phases with their focus, challenges and scope.

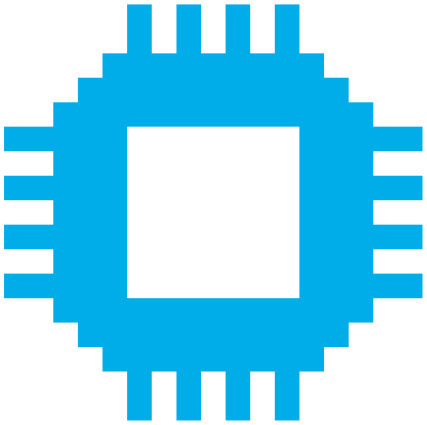
set-up. At this stage, the aim is to increase speed and productivity by introducing a standardized way of working. The organization has brought its first models into production and is now searching for new use cases. Although the focus is mostly on how to organize technically, implementation also becomes more important as the AI initiatives touch an increasing number of (traditional) business lines.

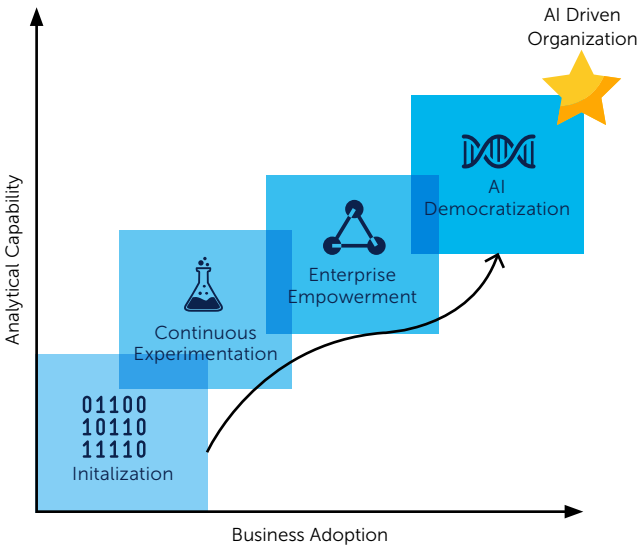
3) Enterprise Empowerment:
At this point, the use of data and clever algorithms are included in the overall strategy. Executive support is focused on activating all business entities, including the more traditional and non-core departments such as HR and finance. Data-driven decision-making and exploring new data products are becoming the new normal. The central innovation budget that funded the innovation before, is no longer sufficient to finance the roll-out of AI products across all business lines. Consequently, this phase focuses very strongly on the Business Adoption axis: the company needs to hand-over the ownership of AI initiatives to the business, including the allocation of budget by the business for its development. Often, implementation challenges arise because there is no-one to liaise between business and the data teams.

4) AI Democratization:
The final phase to become a truly data-driven company requires AI literacy to be embedded in the DNA of the organization. Access to data needs to be democratized through a self-service environment, so that business users can run SQL queries and create reports and visualizations. Establishing a culture of learning from data requires substantial progression along both axes. In terms of Analytical Capability, many employees need to be (re-)educated, self-service analytics tooling needs to be set-up, and company-wide security and compliance needs to be governed. In terms of Business Adoption, the AI efforts have increased exponentially in scale, imposing a bigger demand on sponsorship, funding, and implementation. In reality, very few companies are truly AI-driven. If at all, younger organizations with a pure tech focus, such as e-commerce, get the closest to reaching this final stage – usually because they are unhindered by legacy systems and have established a data-driven culture from the start.

As mentioned already, each phase comes with its own priorities and challenges. As a first assessment, Figure 1 illustrates the typical challenges of an organization in each of the four phases .

The two dimensions and the four phases of AI maturity, can be summarized in a simple plot. Figure 2 shows how organizations tend to grow their AI competencies. The S-shaped progress curve indicates that the journey to the top is not linear. At the start, most organizations typically focus on growing their Analytical Capability, but the step from Continuous Experimentation to Enterprise Empowerment is mostly a journey in the direction of Business Adoption. The final step towards becoming an AI-Driven Company requires substantial progress on both dimensions, as described before.





Initialization
» Find and initiate first use cases: identify opportunities, boot up data, people and tools.

Continuous Experimentation
» Expand team and infrastructure while the number of AI products implemented increases.

Enterprise Empowerment
» Grow AI practice across all business units and put business in driver's seat; buy in required!

AI Democratization
» AI literacy in genes of company; anyone has skills required to make AI driven decisions.

Figure 2: GoDataDriven's AI maturity journey. The journey towards becoming an AI-Driven Company is not linear; most organizations first strengthen their Analytical Capability before embedding AI in the business.

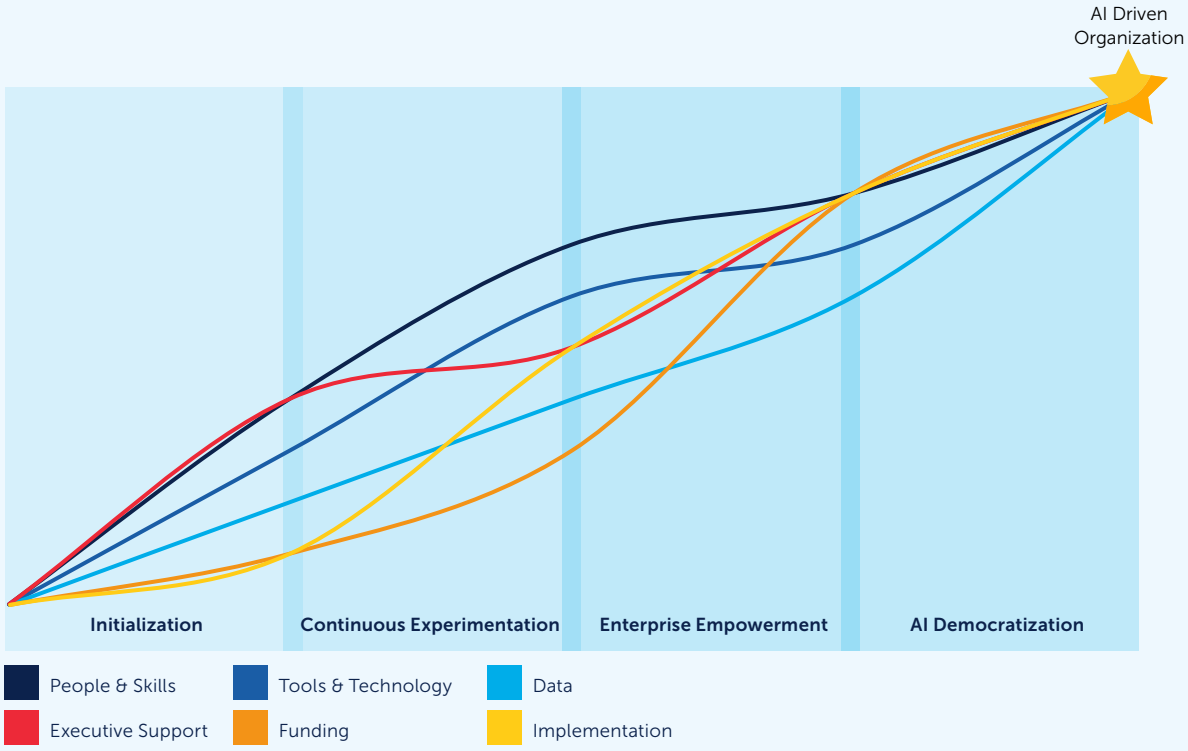


Figure 3: The six elements of AI maturity as introduced in this whitepaper, and how they typically mature along the four phases.

_ Embedding AI in the DNA of Your Organization

This figure visualizes the development of all six elements of AI maturity along the journey. It emphasizes the importance of the elements while an organization advances along the different phases of the journey. Ultimately, the different elements join at the final level; the AI-driven organization. In this whitepaper, all elements will be explored in more detail.

Part I: Developing the Analytical Capability

The three main indicators for describing the AI maturity of an organiation's Analytical Capability are people & skills, tools & technology, and data. These are the core ingredients for the implementation of any AI plan. We'll go into each in detail here.

To begin, let's consider what immature and mature practices look like for each component. You can see this in Figure 4.

	Immature		Mature
People & Skills	Mostly reliant on external consultans		Senior talent in-house
	No vision and strategy for growing in-house talent	»	Clear career paths and training curriculum in place
	Knowledge sharing is minimal or a hoc		Constant knowledge sharing; learning is part of culture
Tools & Technology	Dependent on IT for sandbox environment		Sandbox and production environment in own control
	Self-maintained clusters with lacking maintenance	»	Usage of easily scalable cloud technology
	Monolith legacy systems that can hardley be changed		Technology is built modularly and is loosely coupled
Data	Working with one-off dumps, replication of data sets		Integrated data, easily accessible in centralized platform
	No data ownership, nor data governance program	»	Chief Data Officer in place for data governance and quality
	Organization not aware of importance of good data		Importance of good data demonstrated by AI practice

Figure 4: How to mature your Analytical Capability. Examples of maturity indicators.

_ People & Skills

Having the right people on board is critical for success when launching new AI initiatives. One company that experienced this first-hand is Dynniq. Dynniq is a highly technical and innovative company with much of its internal knowledge traditionally focused on creating hardware and software applications. As Peter Broekroelofs, Chief Design Officer at Dynniq, puts it:

...
"When we started with data science, there was a belief at board level, there was a vision, and there was a high-level strategy. What was missing was knowledge and expertise on how to actually do it."

With limited knowledge of AI and related disciplines such as cloud technologies, Dynniq decided to partner with GoDataDriven to learn and build a competency of their own. Broekloefs says the right approach should be: "Show how to do it, then do it together, and finally do it yourself." This means an external hire should not just deliver the work, but also facilitate knowledge transfer. Resources should be made available to enable employees to internalize the lessons learned. When new training and tasks come on top of regular work, it can be very hard for someone to pick up these lessons.

The Importance of Experienced Professionals
KLM acknowledges the importance of having experienced people from the start. Start with hiring senior, experienced consultants that can do practical hands-on work and can demonstrate how you do AI projects. Especially in the beginning, this is important as there is no way of working, no infrastructure, and probably inaccessible data. Experienced people can help set this up. The same applies to organizations at a later phase of the maturity curve (such as Enterprise Empowerment) where an organization has acquired or grown senior talent themselves. "It is important to use this experience in kick-starting new projects so that you can showcase results as soon as possible," says Bernard Vroom, Group Manager Data Science at KLM. "The earlier you demonstrate the added value of AI, the easier it will be to get buy-in from the business."

Talent Strategy
From the Continuous Prototyping phase onwards, it is important to start nurturing in-house talent. Mature companies develop career paths and a standardized training curriculum for data scientists, data engineers, and other AI-related specialists.

A proper talent strategy can ensure maximum retention of skilled talent and may facilitate a healthy influx of new talent. Doron Reuter, Director of Advanced Analytics at ING Wholesale Banking shares that their Advanced Analytics team actively steers on skill development: "We have a mandatory internal accelerator, which is a one-year program consisting of fortnightly training sessions aimed specifically at the data scientist. For technical people of all sorts, we have a detailed career framework that helps them grow their own competencies."

To retain and attract talent, organizations need to understand that it takes more than a competitive salary to keep AI specialists happy. According to the latest Data & AI Survey[2], the top four benefits to attract talent are:

1) Freedom to experiment
2) Team expertise
3) Flexible working hours
4) Transparent organization

Salary only comes in at fifth place with a score of 6.7/10, clearly lower than the freedom to experiment and team expertise.

[2] Link to 2019's Data & AI Survey: https://godatadriven.com/topic/data-ai-survey-2019-20/

Sharing Knowledge
This emphasizes the importance of learning for AI specialists. Mature companies understand this and seek to actively gauge employee happiness. For example, KLM's Vroom balances teams carefully: "People must have fun and must learn something. To facilitate learning, I ensure a good mix of juniors and seniors in a team, wherein seniors can also be external." ING does the same, Reuter confirms: "For each product, our core team comprises of a team manager, a technical lead, and an analytics translator. Together they clear the roadblocks along the way."

Another important way to grow and retain talent is by cultivating communities of practice. Mature organizations have active local and even global AI communities that routinely come together to share knowledge. Some communities focus on learning for specialists, whereas others are open to anyone in the organization that has an interest in AI. Some companies provide an internal AI portal for business staff to read about AI, the way of working, and how to submit a use case. These communities reach a large audience and facilitate the increase of the AI literacy level across the organization through education, training, workshops, meetups, and other events. They are also essential for Business Adoption, as we will discuss in a later chapter.

_ Tools & Technology

Equal to the necessity of having the right people on board, having adequate tools & technology is an essential ingredient for creating data science products. However, the scope and complexity increase enormously while the AI maturity of the company grows. Reuter from ING can relate:

...
"Technology management is more important in the Enterprise Empowerment phase than in the Continuous Experimentation phase. Whereas in the early phases you can operate in a sandbox environment, in a later phase you will have to connect to all kinds of operational IT infrastructure and systems."

Technology maturity can be measured by looking at the level of control, scale, maintenance, and implementation. Let us zoom in on these four elements.

Control
We recommend working with your own sandbox technology environment to gain and maintain speed in the early phases of Initialization and Continuous Prototyping. As with the need for hiring (external) experienced people, having your own sandbox enables you to experiment quickly and produce something valuable fast. To ensure innovation speed, some of our clients chose to set up their own analytics platform when they started their AI journey. In this case, it is recommended to organize and manage the infrastructure yourself, for both development and production. You don't want to delay innovation because you need to wait on the IT department for the infrastructure.

Scale
Another delaying factor that we see very often is when companies set-up and maintain technology in-house. The downsides of having on-premise compute and storage clusters are the limited flexibility, for example in machine size, and the requirement of continuous operational maintenance by highly-specialized technicians. On the contrary, using easily scalable cloud technology accelerates the development of data initiatives enormously, even on a large scale. Dynniq, for example, chose to work with Databricks as a managed service to build models on billions of IoT sensor data from their intersections. Loading it onto their cloud was less than a month's work.

Maintenance
In the later stages of AI maturity, especially from the Enterprise Empowerment phase onwards, managing your technology stack requires considerably more attention. In particular, integration with other (legacy) infrastructure and systems can impose a challenge. Falco Vermeer, Manager Data & Analytics at Randstad, explains: "While your organization matures, you will experience that quick engineering solutions that worked in the early maturity phase do not suffice any longer. It becomes likely that the development of new prototypes stalls because the increased time needed for maintenance." The problem is that at this stage, most teams don't have sufficient resources to cater to all of the needs anymore while considerable investment is required to bring the technology stack to the next level. Randstad's ambitions in that sense are to work towards "a module-oriented technology stack, wherein it is easy to plug into multiple systems," Vermeer says. "Organizing your solutions in standard building blocks will speed up the pace of integrating products into the organization."

Implementation
For the implementation of predictive models, there is no one-size-fits-all approach. In quite a few organizations, after creating a minimal viable product, the data science team hands over their models to dedicated product operations teams. At ING, operations are an integral part of the product teams. Reuter explains: "We develop end-to-end AI systems within our Advanced Analytics team. So far, that includes the Ops part in deployment. We haven't yet reached the stage where we want to hand over a system to IT."
In that light, he advises organizations working on AI products to think carefully about their integration. Are you bringing a relatively small AI feature to a bigger existing product team? Or are you going to build the entire end product yourself as well? As AI is often just one small feature of a bigger data-based product, it is sometimes hard to look at AI as a product itself.

_ Data

The last indicator of maturity when it comes to Analytical Capability is the way you organize data. In the AI Maturity Journey, we evaluate data maturity in terms of data accessibility, governance, and quality.

Data Accessibility
To analyze data, you need to have access to data. This can be one-off dumps for experimentation purposes, but for productionized AI models, data must be regularly available. Custom data pipelines per use case can do the trick initially, but to prevent duplication and dispersion of data while your Analytical Capability grows, it becomes important to consolidate data sources.

Many companies set-up a central data lake that holds information in one place. However, this requires significant buy-in from many stakeholders like data owners, (enterprise) architects and the Operations department.

Randstad takes such an approach by servicing data through a central platform. When talking about data availability, Vermeer stresses that it is important to value and prioritize according to the richness of your various sources, and to consider the timelines to make data available.

Governance
As multiple data sources become available and multiple consumers start using that information, data governance questions start to arise.

Analytics provides value, but data management is just as important. You don't want big AI programs to get stuck because the data is not being managed properly. For this purpose, many companies today appoint a Chief Data Officer (CDO). It is important that the CDO can influence business stakeholders, like the CEO or CFO. This is because data delivers value to the business directly and data governance programs often require change management. Steven Nooijen from GoDataDriven explains:

...
"Ideally, the CDO is part of the executive team where he advises the business on usage and management of data."

To be successful it is important to pay attention to usability, integrity, and security of data in the enterprise. In fact, this is essential to reach the last phase of data maturity: the AI-Driven Company. In the ultimate stage of maturity, data itself should be considered and managed as a product of the company.

Quality
Even the most pragmatic and experienced AI specialists cannot create value from low-quality data. "Garbage in, garbage out" is what they will say. This brings us to data quality.

It is difficult to sell data quality programs to the business, as these usually concern huge trajectories. It is important that AI specialists make recommendations about what to improve based on hands-on project experience. In this way, you can "organize data in the slipstream of use cases," rather than attempting to solve everything in a big bang.

Although much of the above requires significant investment, a fair amount of organizations have already tackled related issues for Business Intelligence (BI) purposes. "Well-organized BI accelerates AI initiatives. First of all, because the data is already structured and there is some affinity with data. And secondly, because with BI in place, a certain appetite for data-driven decisions already exists within the organization," Randstad's Vermeer explains. In that sense, he thinks BI experts can function as pioneers or catalysts for AI innovation. "AI is definitely more complex and harder to scale than BI, so over the long-term, re-education is required," he adds.

Part II: Embedding AI within your organization

The second component to measure AI maturity is Business Adoption, or the embedment of AI within an organization. The three indicators that we will take a closer look at are executive support, funding, and implementation. See Figure 5 for a quick overview.

	Immature		Mature
Executive Support	Bottom-Up initiatives; low board level involvement		C-level leads AI movement & provides a purpose
	AI use cases are pushed from AI capability	»	Business pull on AI capability for new use cases
	Little communication about AI developments		AI community that activates the organization
Funding	AI initiatives funded by IT		Business pays for AI solutions
	No innovation budget for experimentation	»	Central budget available for research & innovation
	No value measurement		Value based prioritization & benefit tracking
Implementation	AI products developed in isolation without business		Design process in place that guarantees value impact
	Hard to roll out products in organization	»	Business in charge of roll out and product adoption
	AI thinking "comes on top of" regular work		Organization makes resources available to implement AI

Figure 5: How to improve Business Adoption by assessing executive support, funding and implementation.

_ Executive Support

High-level management needs to be involved in AI initiatives for these initiatives to become successful. It is particularly important that management contributes in the form of sponsorship, by clearing roadblocks and supporting cross-organizational AI initiatives.

Setting the Stage

Often, it's the C-level leadership that makes the push for AI initiatives. In the case of Dynniq, it was the Chief Design Officer, while at ING it was the CEO. A C-level leader provides the company with a purpose. As ING's Ralph Hamers said in 2017: "We want to portray ourselves as a tech company with a banking license." Reuter, who works at ING as an advanced analytics director, stresses the importance of such a declaration, and the potential effect on the organization: "Such a statement translates into strategy and creates a purpose for people. Having a leader and a strategy means the organization will pay attention." This, in turn, means you have a mandate, people free up time and resources, and the changes required for AI are supported throughout the organization.

Generate Business Pull

A beneficial side effect of having a high-level sponsor is that ideas for new use cases will arise from across the organization. The origin of use cases is an indicator of AI maturity, as it tells us something about ownership and involvement across the business. At AI-immature companies, ideas are often pushed from the AI capability, while at mature companies it's the business that comes up with new use cases, effectively creating a pull effect on the AI capability.

Mature companies have a long backlog with new use cases that they want to tackle and often have something like an Analytics Board to prioritize and kickstart ideas. This Analytics Board, staffed by senior business managers, also supports use cases and opens doors within the organization.

ING has a similar structure. Its analytics board comprises three executives: one each from IT, business and analytics. Together, they prioritize the backlog, fix funding issues and solve team impediments. Forcing the business to be involved through such a board tremendously grows your chance of creating valuable AI products.

Appointing AI Ambassadors

Aside from board-level sponsors, it is also important that operational business lines are involved in the exploration of new use-case ideas and in the implementation of AI products. To do this, mature companies set-up a community where AI specialists act as ambassadors for the rest of the organization. The community organizes meetings, training sessions, and workshops with the goal of creating a pull for AI from the business. KLM manager Vroom said:

...
"We have an ambassador role within the organization wherein we actively look for new business sponsors to begin projects with. The community is open to anyone that has an interest in AI."

The community plays an essential role in spreading sponsorship across the organization, an important aspect when entering the Enterprise Empowerment phase.

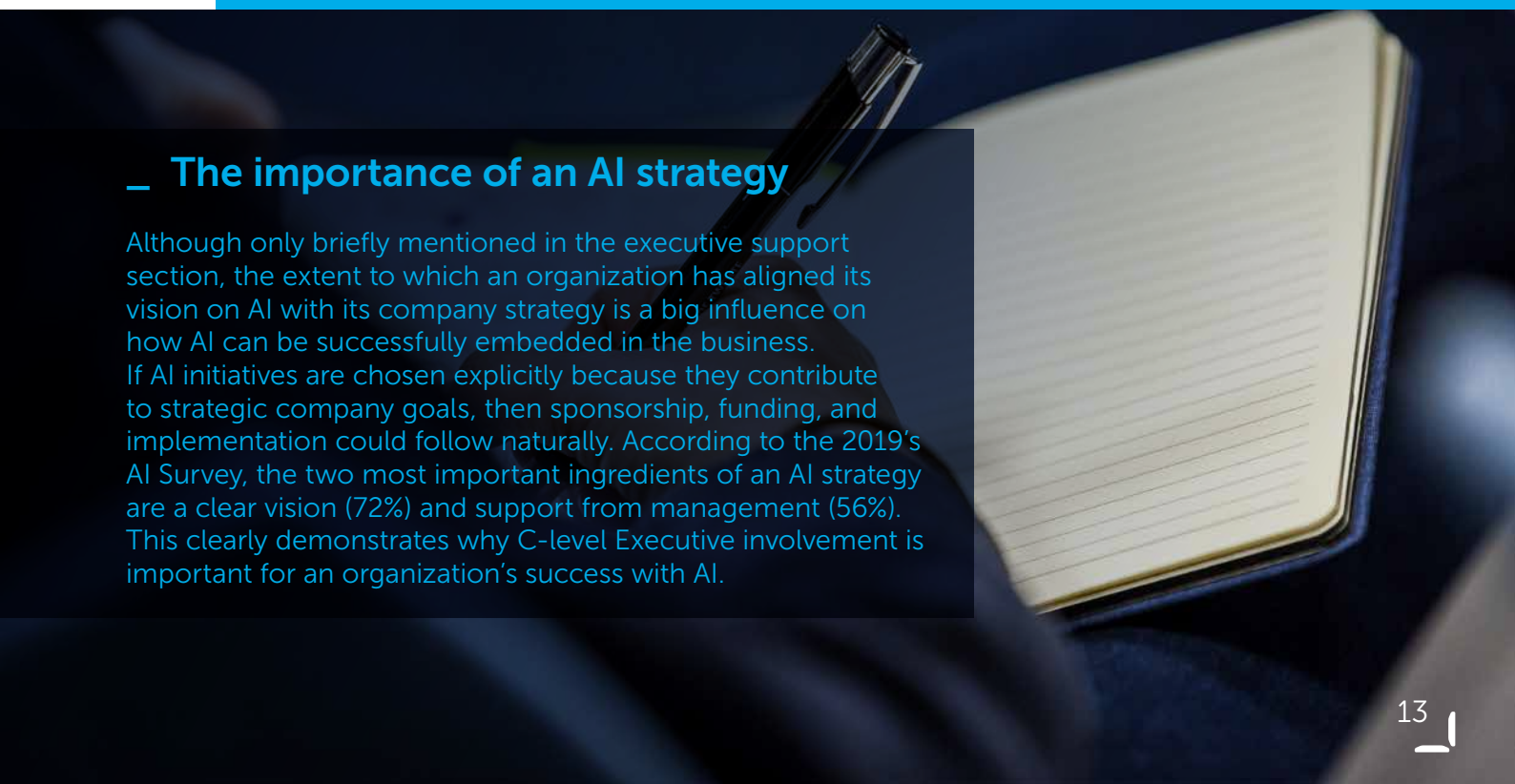
Although executive support is critical to success, it is important that sponsors remain objective. "If there is no objective board evaluating use cases, an idea can become a board member's pet project. They become blind to the business case and can push the project forward even when the impact/effort ratio is no longer beneficial," Randstad's Vermeer explains. "It helps when board members are value-driven or have an affinity with data, as this makes it easier to gain trust in data over gut".

_ Funding

There is no such thing as a free lunch. Like executive support, another key organizational element that defines AI maturity is funding. This one is pretty straightforward. It boils down to the question: Who is paying for the efforts? There are three questions that can be asked to expose the source of budget within an organization:

1) Does the business/consumer pay for the AI products it consumes?
2) Is there a central budget for innovation and experimentation?
3) Is the company actively tracking ROI on its AI investments?

If the answer to these three questions is yes, then an organization is ready to become an AI-Driven Company!



_ The importance of an AI strategy

Although only briefly mentioned in the executive support section, the extent to which an organization has aligned its vision on AI with its company strategy is a big influence on how AI can be successfully embedded in the business. If AI initiatives are chosen explicitly because they contribute to strategic company goals, then sponsorship, funding, and implementation could follow naturally. According to the 2019's AI Survey, the two most important ingredients of an AI strategy are a clear vision (72%) and support from management (56%). This clearly demonstrates why C-level Executive involvement is important for an organization's success with AI.

Getting Budget from the Business
In the Initialization and Continuous Experimentation phases, the focus lies on proving value and growing the Analytical Capability respectively. These phases are often initiated by a single sponsor (see the previous section on executive support) with sufficient budget to kickstart the company's initial projects. However, when the AI capability starts to scale, this funding model is no longer sustainable.

This can be solved by setting-up a process where the stakeholders that benefit from an AI product, like the end-users or beneficiaries of the AI solution, pay for what they consume. Benefits for example can be increased revenues or decreased costs. The approach is the same across all AI mature organizations; "The budget for use cases should come from the business," says Vroom. "At KLM, Product Owners are responsible for sourcing budget from their business sponsors. They then allocate the budget to the required resources, often the team with the AI capability." Business funding is essential for scaling AI across an organization (Enterprise Empowerment).

Innovation Budget
In response to the question how to convince the business to allocate budget for a use case, Vroom says: "The willingness to pay comes from showcasing a first-use case quickly." He's referring to the importance of having experienced senior people on board to demonstrate value for a new project as early as possible. This, however, does imply that an initial investment in a use case has to be made by the AI capability. This ties into the second funding imperative: AI mature companies have some central innovation budget for use-case experimentation. At some companies, funding for the initial phase of a project comes from a central innovation budget. As a result, there is no excuse for the business to not participate. However, after the experiment has proven its value, there must be a switch so that the business takes on the investment for further development. This allows the principle of "scale or fail fast". If the business refuses to invest, apparently, there is not enough value in the use case (yet).

Measure Value!
Mature organizations measure the ROI of their AI efforts. To judge a good investment, objective decision criteria need to be established. Value-based prioritization requires an estimation of the value upfront and tracking of the benefits when the AI solution has been productionized. Vermeer from Randstad is well aware of the dangers of not measuring value: "When you do not evaluate the return of investment from your funds, sponsors lack the objective insights to take substantiated business decisions and are potentially missing out on more promising use cases." Vermeer emphasizes that it is important for decision-makers (read: the Analytics Board) to learn about the successes and failures of their AI investments to make better value-based decisions in the future. Broekroelofs (Dynniq) offers a realistic and practical insight into funding:

...
"Organizations need to understand that they have to spend money to make money."

As costs come before benefits, Dynniq takes a lean-and-mean approach towards developing profitable products as quickly as possible. With the value proven, Dynniq expands the application incrementally. Broekroelofs notes that it is harder to develop a product for external clients than it is for internal process optimization. For that reason, he suggests, "Start with data science for internal use cases. You can then capitalize on the low-hanging fruit and create a cash cow that frees funds for the more challenging experiments on your backlog."

_ Implementation

An AI product only delivers value when there is action based on the outcome. Easy as this may sound, many use cases strand at this final step. If end-users are not involved right from the development phase, this can lead to a mismatch between the needed product and the delivered product. Equally easily forgotten is how the product will eventually be rolled out across the organization. This often requires change and end-users may be reluctant to adopt a product they weren't involved with from the start. AI-mature organizations avoid these implementation issues by adhering to a product design process. Such a process typically includes a plan on implementing the product across the business and makes sure the organization is aligned from the early stage of use case discovery onwards.

Following the Design Process
An example of an **AI solution process** can be seen in Figure 6. Such a process has two main goals:
1) Ensure that the addressed business problem is the right one;
2) Make sure that the solution satisfies the need of the end-user and is built correctly.

Reuter confirms its importance: "At ING, we have developed our own AI solution process to guarantee impact for the end-user and the customer journey. We strictly enforce stage gates between phases, making it really hard for a use case to get through each stage." Strict as it may sound, it is the only way to catch possible mismatches as early as possible. The process should typically be guided by a person who can liaise between business and data experts, often referred to as the Analytics Translator. Discover more about this crucial role in our whitepaper on the Analytics Translator[3].

AI Product Adoption

The adoption of AI products by end-users begins with the creation of multidisciplinary teams of AI and business experts. "It is smart to decentralize the AI specialists and position them across the organization," recommends KLM's Vroom. "This matches the agile mindset wherein teams can work on products autonomously." Such a move ensures that the responsibility for AI product adoption lies with the business that leads the agile team instead of with the Analytics Capability. When the AI specialists teams are relatively small the business needs to take responsibility for the roll-out of AI products. We see that some companies revert to so-called accelerator squads. These teams drive business change by introducing new ways of working that can be driven by AI tools. The order is important; you cannot push a tool and expect the way of working to change.

Change Takes Time

Changes wrought by AI products can impact the regular workload of people across an organization. It is good to be aware that these changes often come on top of regular work activities, ING's Reuter says.

...

"Creating a truly data-driven mindset across the organization is, therefore, a slow process."

Communicating continuously helps lower barriers. "By letting people know what you are doing, they better understand how they can contribute," he adds.

Many organizations still face a big knowledge gap between people who are working with AI and people who aren't. Although it is easy to generate new use-case ideas, following up on them and executing them is harder. For an organization to make the step to becoming an AI-Driven Company, business and analytics translator skills need to be taught and acquired. Only then can AI truly be rolled out across an organization.

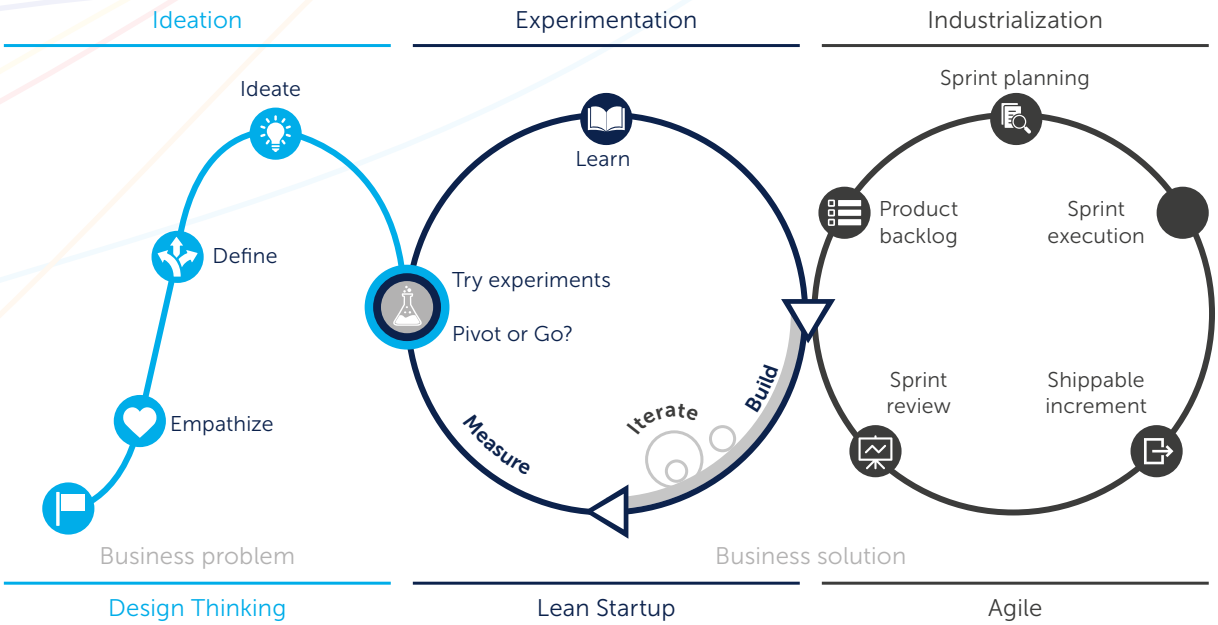


Figure 6: The AI solution process[3] as introduced in GoDataDriven's Analytics Translator whitepaper. This figure shows three stages of AI product development including the different stage gates to guarantee the delivery of valuable AI products.

[3] Find the Analytics Translator whitepaper at: https://godatadriven.com/topic/whitepaper-analytics-translator/

Part III: Leveraging the Maturity Journey

Like with AI, the only way to get value out of this whitepaper is to act upon it! In this section, we challenge you to review your own organization's AI maturity and discover where you can improve.

_ Indicate Your Current Level

GoDataDriven's AI Maturity Journey provides a set of dimensions relevant to AI and combines these into four maturity levels. Using this journey (visualized in Figure 2) and the two axes of Analytical Capability and Business Adoption, you can assess which level your organization is at and where your organization would like to be. The next step is then to determine how important each dimension is to business and corporate strategy. Based on the directions for AI maturity as outlined in this white-paper you should now be able to identify best-practices that can bring your organization to the desired level of AI maturity.

_ Designate Your Focus Areas

Leveling up in AI maturity is not a linear journey. Each phase requires attention on different areas as is visualized in Figure 7. For example, in the Initialization phase, it is vital to have experienced people on board who can demonstrate value quickly to your executive sponsors. The Continuous Experimentation phase then focuses on building up the internal AI products. Typically, these two early phases are characterized by a relatively small number of people who are continuously experimenting and validating new AI opportunities.

In the next step of Enterprise Empowerment, your attention should shift to the rest of the organization. You need to make sure all business units are engaged, that they are prepared to invest, and that they are willing to adopt AI and adapt to the change. The focus of the organization can now shift from building up the technical capabilities to-wards networking and organizing. One of the hardest challenges for many organizations is the organization of the data, partly because the investments of data quality management and integration across the organization can only be justified when an organization reaches the final phase; AI Democratization. Typically, organizations start to dedicate time to deal with the data quality when all other elements have matured.

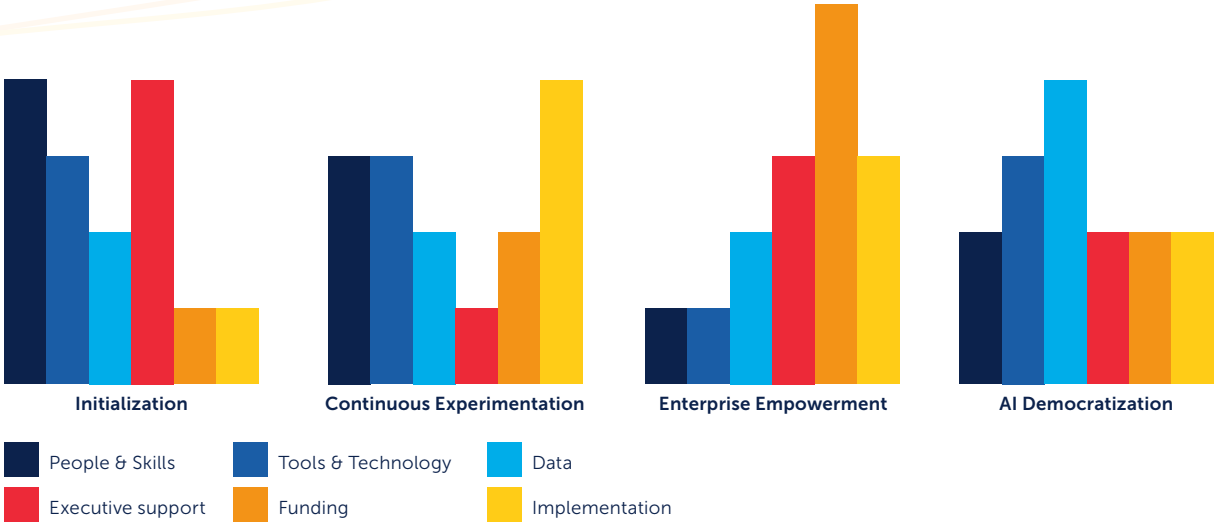


Figure 7: Chart shows how to divide your attention across the six maturity topics to be successful in each phase. Particularly noteworthy is the required improvement in the Enterprise Empowerment phase for business adoption. Executive Support, Funding and Implementation all need to be developed significantly.

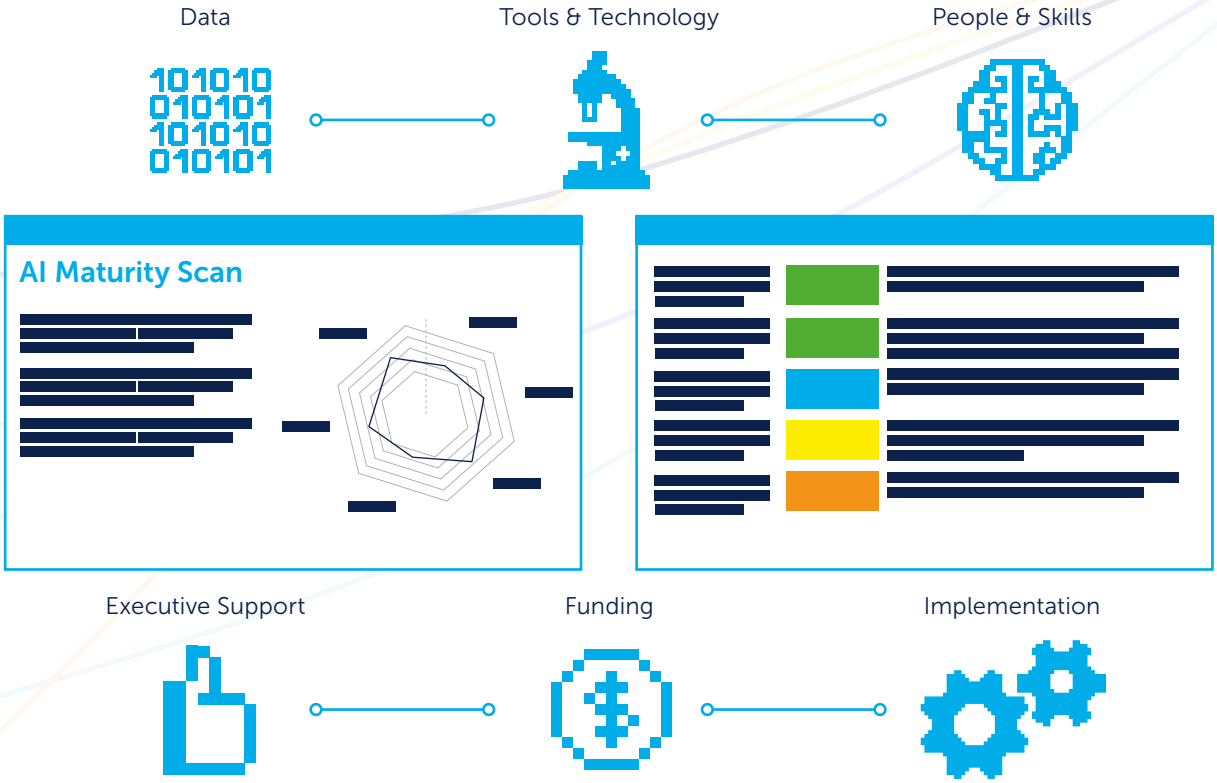


Figure 8: GoDataDriven's AI Maturity Scan provides an objective review of an organization's AI maturity based on the indicators mentioned in this whitepaper.

_ Accelerate Your Growth

The GoDataDriven AI Maturity Scan allows organizations to quickly obtain insights about their AI maturity and help the reviewed organization to improve its current practices and increase its analytical maturity.

This scan consists of a systematic review of the existing AI practice and examines all focus areas described in this whitepaper. Each area consists of AI-relevant questions, which are scored on a scale from 1 (common practice) to 5 (desired practice).

Scores are allocated based on interviews, architecture and code reviews. The average score per area constitutes a final verdict for that attention area.

Based on the scan's results, an as-is situation is identified, and a gap-analysis can be made to determine the differences between the current and future ways of working. The gap analysis can then be turned into actionable insights that will help the client transform into a more mature, data-driven company.

...

"I would recommend doing GoDataDriven's AI Maturity Scan. It is a quick and objective way to get insights into how you are doing, even though you are likely already aware of many of the findings subconsciously. It is especially helpful in defining the next steps, as it gives a structured overview of what needs to be done in each attention area. It is also helpful for evaluation. You can look back later and assess whether you have made the desired progress."

_ Falco Vermeer, Data & Analytics Manager at Randstad

Interested in an AI Maturity Scan for your organization? Please contact Steven Nooijen, Lead Data Scientist (signal@godatadriven.com).

Meet the experts

_ Steven Nooijen
Lead Data Scientist _ GoDataDriven
Steven likes to combine thorough data analysis with strategic business thinking. Using this skill set he has demonstrated the added value of AI across several industries, often redefining current business processes using data-driven insights. His specialty lies in kick-starting data science initiatives and capabilities, and in bringing ideas, people, data, and technology together to make it succeed.

The AI Maturity Journey is Steven's brainchild. Based on his consulting experience he identified the different maturity phases and validated the journey with the other experts featured here. Contact Steven if you want to talk more about how AI initiatives can be accelerated in your organization.

_ Peter Broekroelofs
Chief Design Officer _ Dynniq
Peter is an entrepreneurial hands-on CTO with 25 years of IT experience in both startup and large organizations. He is seasoned in mobile technology, digital services, and platform architecture and has a track record in international product management, strategy and business development.

As Chief Design Officer at Dynniq, Peter is responsible for the design, development, and delivery of innovative products and services in smart mobility, parking, and energy. He facilitates the transformation from infrastructure to digital services using IoT, data, AI, cloud, and mobile technology.

_ Falco Vermeer
Data & Analytics Manager _ Randstad
Falco is responsible for a team of BI Specialists, Data Scientists and Data Engineers who develop data-driven applications and management information for Randstad Netherlands. Falco is always on the lookout for new ways to store, disclose, and use data to optimize the business.

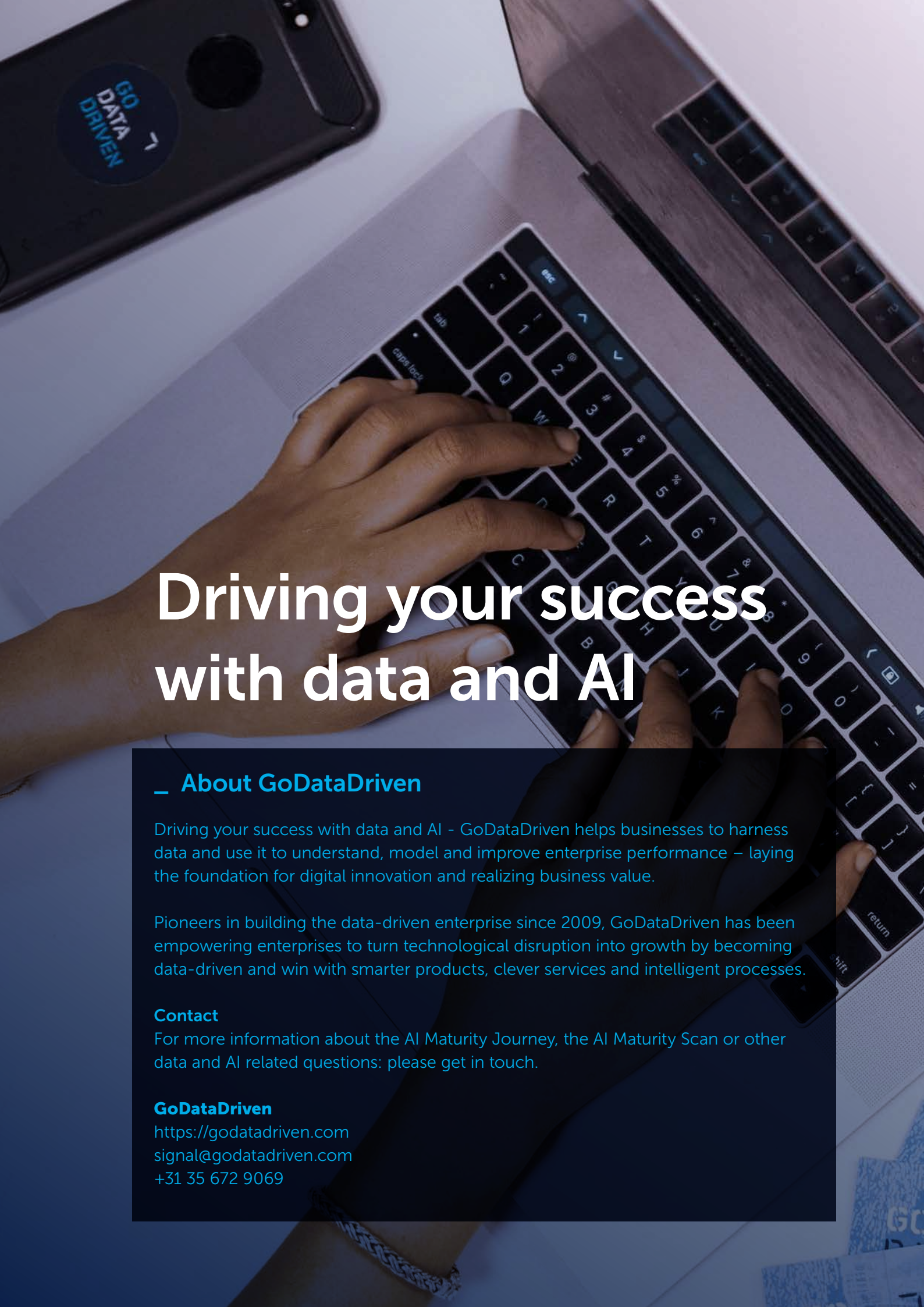
Within Randstad, Falco has made the move to strategic advisor wherein he will guide Randstad Netherlands towards using more Data & AI-driven solutions.

_ Bernard Vroom
Group Manager Data Science _ KLM
Bernard Vroom guides a team of AI and Operation Research specialists who work on a wide variety of projects to support and improve business processes and decision-making within KLM.

This group of specialists works for all business domains within the airline; ranging from core airline departments like Commerce and Cargo to supportive services like HR and Finance.

_ Doron Reuter
Director of Advanced Analytics _ ING
Doron Reuter is head of business development for ING's Wholesale Banking Advanced Analytics team, where his goal is to make colleague wholesale bankers at his organization aware of the potential of advanced analytics and facilitate their advanced analytics project ideas.

Doron loves solving wholesale banking business and user challenges by applying big data technologies, advanced analytics and sound design principles. Doron works with a world-class group of people to bring to market data-driven algorithmic products that disrupt wholesale banking.



Driving your success with data and AI

About GoDataDriven

Driving your success with data and AI - GoDataDriven helps businesses to harness data and use it to understand, model and improve enterprise performance – laying the foundation for digital innovation and realizing business value.

Pioneers in building the data-driven enterprise since 2009, GoDataDriven has been empowering enterprises to turn technological disruption into growth by becoming data-driven and win with smarter products, clever services and intelligent processes.

Contact
For more information about the AI Maturity Journey, the AI Maturity Scan or other data and AI related questions: please get in touch.

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