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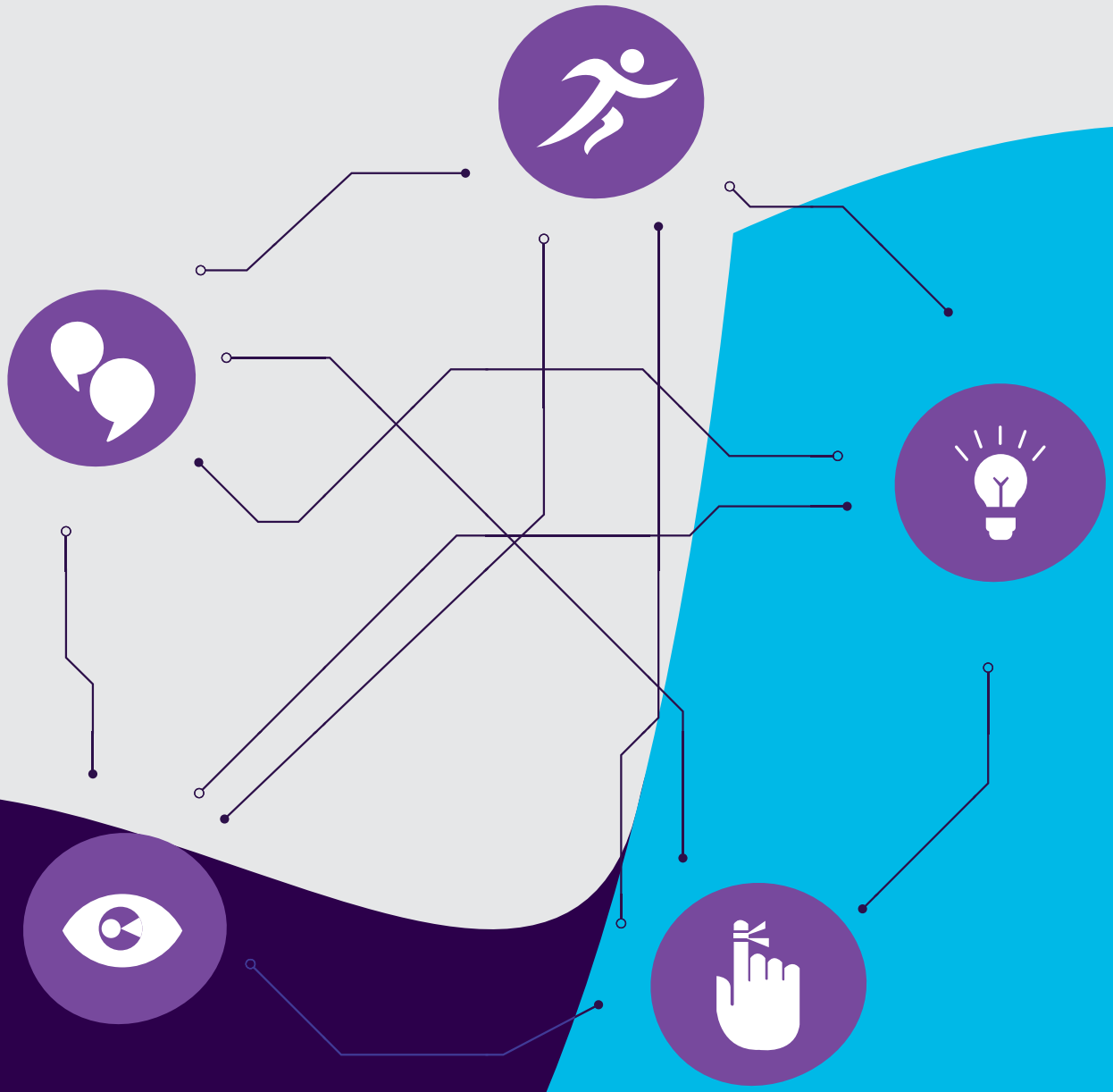
The new age of hyperintelligence and its impact on business



Xavier Hochet

Christopher Stancombe

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Foreword

Productivity growth has been slow all over the world during the last decade, essentially since the global financial crisis of 2008–2009. Persistent low productivity suggests that there is an issue that is more structural and long term. Although the productivity slowdown is clear in terms of data, the causes are less clear. Nevertheless, looking back on the last 250 years or so, one thing remains clear: technological progress is the central reason behind economies' growth and explains why incomes have consistently improved. Technology has created the wealth in which or with which we live. Digital technology contributes to this. The question now is how AI, as the most recent technology, is going to contribute.

AI has the potential to be more extensive but the big question is whether it will live up to its promise. We have seen huge improvements in AI from unstructured learning programs. But questions remain as to whether people will accept recommendations/dealing with AI instead of a person. Eventually, over time, AI will be psychologically accepted.

Companies have to respond to AI opportunities to maintain their positions. Many solutions are already mature and have been made available by companies dedicated to AI development. All major firms will have to think about how to use these different solutions and may decide to opt for their own investment in R&D as well. Outside of the big tech firms, this is where the main benefits of AI in terms of productivity may be seen.

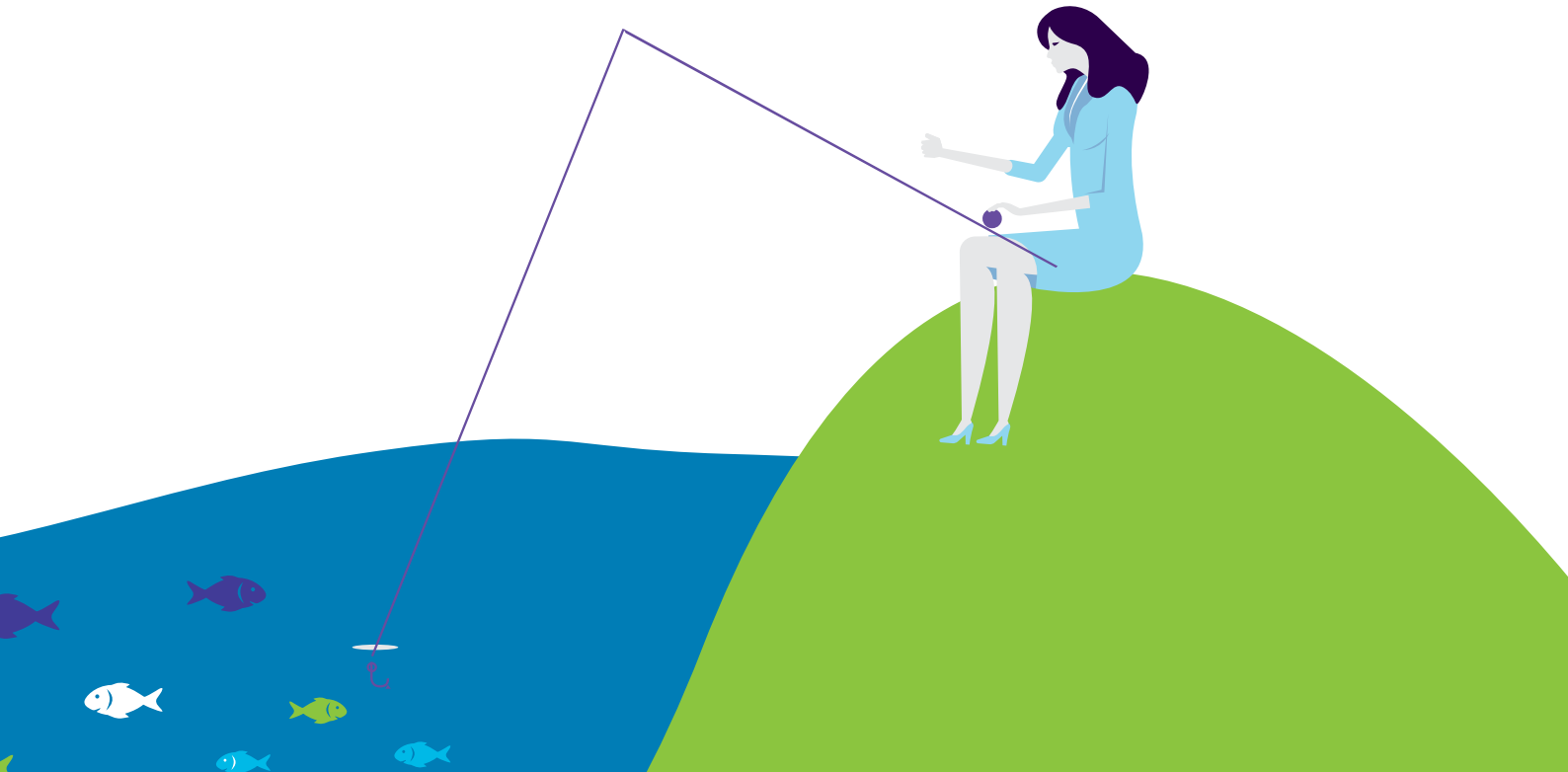
Another lesson learned over the last few years is that it is not necessarily the companies that have invested most money in AI which benefit most from it. AI technology cannot just be plugged in. Companies have to decide on a strategy, follow through obsessively, make the necessary organizational changes, and balance their speed and scale all the way.

The AI revolution is going to have an impact on jobs and people. AI creates high levels of anxiety, with the overriding fear: "will there be enough jobs?" Many recent studies have focused on this very topic. They are based on extrapolation about what a job is today and how it could be affected by AI/automation. Although it is helpful to identify the pitfalls, the outcomes of these studies must not be the only things considered when discussing AI.

As a society, we should see these topics as being highly important. Expecting companies to internalize all of them is unrealistic. They should be reflected in our laws, policies, and institutions. The focus of companies and governments should be on skills instead of jobs when looking to the future. Policies should protect people, not jobs. People need to be trained to be resilient and to have a good basic level of skills that can be developed over the course of their lifetime. They need support so that they are ready to cope with the changes to come.

There is new ground to invent. It all depends on how we, as a society, structure laws to influence how this new ground is implemented and how companies will use it. We have choices to make. Companies have choices to make. Shaping or preparing for the future at the time of AI is all about making a choice. It is about leadership.

John Michael Van Reenen
Professor of Applied Economics at the MIT Sloan School of Management and Department of Economics
Cambridge, Massachusetts, 2018



AI is opening a new chapter for business

From fiction to fact

Science fiction films and novels have long painted a future complete with multi-functional robots, "augmented" men and women who enhance their human capabilities, and autonomous machines that take control and govern the world.

These futures – while often dystopian in nature for dramatic effect – have familiarized us with the idea of a world where smart technology can do everything. That future is now becoming reality.

Yet far from presenting a threat to humans flourishing, new uses of technology are emerging every day that are changing how we live and interact with the world for the better.

Specifically, technology pioneers are focusing unprecedented financial resources towards developments in AI.

These developments – such as satnavs that help us navigate from A to B, or apps that recommend a film we might enjoy, or fitness trackers that monitor our health and wellbeing – are designed to enhance our lives, give us more time in our day and liberate us from mundane tasks where we so choose.

We have the power

AI has a long history of theory and research behind it. Yet there have always been computational limitations that have constrained its progress. We're now at a point where technology is powerful enough, and accessible enough, to bring 70 years of thinking and ideas about AI to life.

It's a new age for humankind and for business, turning imagination into reality and opening up all sorts of possibilities.

Artificial theory to reality

1950 – Alan Turing designed a test of a machine's ability to "exhibit intelligent behavior equivalent to, or indistinguishable from, that of a human."

1955 – McCarthy, Minsky, Rochester, and Shannon predicated that "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."

Therefore, it is clear that AI has a long and respected history. Significant advances have been made possible by a coming together of multiple disciplines – mathematics, statistics, computer science, biology, biotechnology, neuroscience, and cognitive science. After decades of fundamental and applied research, hundreds of billions of dollars of investment and the widespread adoption of computer technology, we are starting to see an "overnight sensation."

> *"Today's upsurge in AI development can be viewed as decades of ideas and work finally bearing fruit."*
>
> **Christopher Stancombe**
> *Executive Vice President, Capgemini*

Intelligence for all

AI encompasses many technologies, diverse in their type and nature. Yet common to them all is one aim, to simulate the functions that make us "intelligent": our abilities to observe, remember, analyze, communicate and act.

We think of these as the "five senses of intelligence" – and we'll explain how businesses can use them as a framework for adopting AI solutions in a separate chapter.

Pioneers of progress

The significant computing power now available via the cloud has accelerated the development of real-world AI solutions. Companies can experiment like never before, and process huge data volumes without heavy investment in on-premises IT by renting computer resources "as a service". This provides them with the agility to fail safely often and learn quickly, adapting and evolving at an extraordinary pace.

The stage is set

Today's upsurge in AI development can be viewed as decades of ideas and work finally bearing fruit. Thanks to improved communication networks, increased processing power and huge storage capacity, which is more affordable and accessible than ever, we have the ideal conditions for AI to thrive.

An enabler of progress

There are, of course, well-publicized concerns about the increasing adoption of AI by businesses and organizations.

Philosophers, sociologists, anthropologists and many people of influence have been theorizing on the future of work and employment – questioning the role of humans in a world where robots can perform not just simple manual tasks, but more complicated work as well.

AI shouldn't be seen as a threat, but as an enabler of human progress. Today's AI technologies are embracing every human activity and helping us rethink how we live our lives for the better.

As budgets rise for AI and robotics research across the globe, we're seeing the birth of new opportunities. It is shifting the focus from learning and training to imagination and creativity, allowing everyone and anyone (not just the technologists) to contribute valuable ideas that enhance customer experience, employee satisfaction, and people's lives.

Reshaping old models

Established businesses, in their current form, are the product of a bygone age – and the emergence of AI is bringing about the need for radical change.

Most managerial and organizational models in place today were inherited from the early industrial revolutions.

Despite the tremendous progress made in workplace tools, training and qualifications, these models have remained virtually unchanged and inflexible.
As such, people find it difficult to pursue their own aspirations at work, even when encouraged to be more creative, independent and enthusiastic.

Adapting to a new normal – hyperintelligence

As businesses embrace today's AI revolution, there is the opportunity to reshape organizational models completely.

We can be less concerned with who does and knows what, human or machine, in a quest for efficiency. We can focus instead on empowering people to work together with AI. The scale and speed of today's technology removes the constraints of previous eras, allowing people to bring all sorts of new skills and ideas to the table.

This alliance will move businesses to a state of "hyperintelligence" – where human intelligence, innovation and imagination is liberated and enhanced by technology. Ultimately, this will raise the value and effectiveness of everything a business seeks to do.

In the next chapter, we will demystify AI by introducing a framework that maps and compares its components to the five senses of human intelligence. This will explain how today's AI solutions are the simple coming together of different technologies that mimic how humans observe, remember, analyze, communicate, and act.

We'll look at how a lot of these technologies are already very familiar to us, and therefore how businesses can deploy them easily without deep technical expertise to improve services, enhance customer experiences and transform the workplace.

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>
> **Xavier Hochet**
> *Head of Europe, Capgemini's Business Services*

AI explained – using a framework based on five senses

AI must be made accessible to everyone

AI brings new opportunities to all areas of an organization. Capitalizing on it requires a full commitment across all business functions. It must be embraced by everyone, not just technologists.

All too often though, AI is viewed as complex or mysterious. So, how do you begin building AI into your business and engaging with the whole workforce to optimize and release its benefits?

In this chapter, we outline a simple framework that compares the components of AI to five senses of human intelligence – an approach that makes AI accessible to everyone in the business, enabling the organization to release the full value of an intelligence-first approach to transformation.

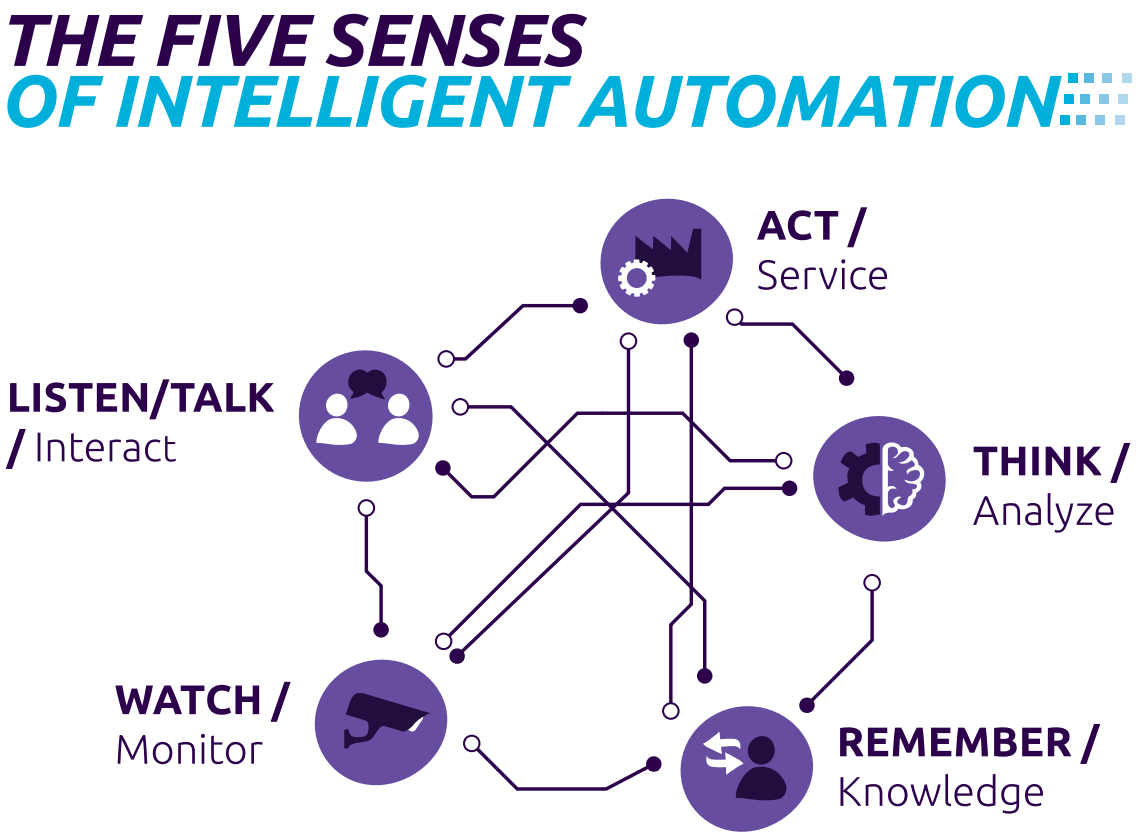

Figure 1. The Five Senses of Intelligent Automation

Creating a framework to facilitate understanding

Inside the brain of a human

As humans, we make sense of the world using a combination of different cognitive functions:

- **Attention –** the state of observation and alertness that allows awareness of what is happening in the environment (*Ballesteros, 2000*).
- **Memory –** the retention of information over time for the purpose of influencing future actions (*Sherwood, 1995*).
- **Language –** the production of spoken or written signs that symbolize objects, ideas, etc. (*Lecours et al. 1979*).
- **Praxis –** learned motor activity and the generation of volitional movement for the performance of a particular action or towards achieving a goal (*NeuronUp*).
- **Executive functions –** required for planning, organizing, guiding, revising, regulating and evaluating behavior necessary to adapt effectively to the environment and to achieve goals (*Bauermeister, 2008*).

When these cognitive functions interact, we demonstrate human "intelligence."

Inside the brain of a business

An artificially intelligent business or organization requires similar functions:

- The ability to monitor an environment and activities – i.e., attention.
- The capacity to retain and organize data in the form of knowledge – i.e., memory.
- The ability to communicate and interact – i.e., language.
- The execution of actions and operations – i.e., praxis.
- The capacity to process and analyze knowledge – i.e., executive functions.

We refer to these functions as the "*Five Senses of Intelligent Automation*" (see Figure 1). When they are combined appropriately, they enable organizations to transform themselves.

Applying the framework to deliver transformation

Applying this concept provides a framework to visualize traditional activities in a completely new way that allows you to reimagine them. It allows innovation and creativity to take advantage of AI technologies by establishing a human metaphor for machine activities.

Stage 1

The first step is to identify activities that will have the greatest benefit to your business. The identification of these activities will help you understand the key differentiators in your business and where there are opportunities for significant competitive advantage.

The objective is not just about reducing cost by applying lean principles to redesign business processes. It is to apply design thinking to deliver better, more effective and efficient outcomes.

Stage 2

This step is about mapping the people, processes, and technology to the framework. It is also vital to establish why this activity is performed and how improvements will benefit the organization. This creates the basis to allow design thinking.

You should clearly define how you will measure the improved outcomes and their impact on the organization. We'll revisit this point in a later chapter.

Stage 3

The final step is about reimagining your activities. You should involve a team of people with a broad mix of seniority and experience. It should include, but not be limited to, knowledge on existing and new technologies, processes, and business needs. This will lead to richer solutions and facilitate unexpected synergies.

Adopt an AI-first approach that explores and investigates new technologies mapped to the five senses. As an example, watch how intelligent automation is radically transforming traditional finance operations like procure-to-pay and credit-to-cash.

During this step, it's important to test how your new technologies interact with each other, and with people and processes, to deliver better outcomes. Connecting each of the senses creates the intelligence!

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> *Executive Vice President, Capgemini*

AI is part of our everyday lives

This example of an in-car navigation system shows how the five senses are already working together in technology that we use every day (see Figure 2). Such is the accuracy, convenience, and intuitive nature of satnavs today, very few people navigate using maps anymore.

There is no time to waste

The satnav is just one example of how AI is improving our lives. The rapid pace of development in solutions underpinned by AI will soon completely eclipse the performance of those that are not.

Intelligent organizations will take full advantage of the opportunities that AI enables by involving all of their workforce in transforming their business.

In the next chapter, we'll look in detail at the impact AI is having on people in a business by considering new organization designs and the changing roles of managers and workers.

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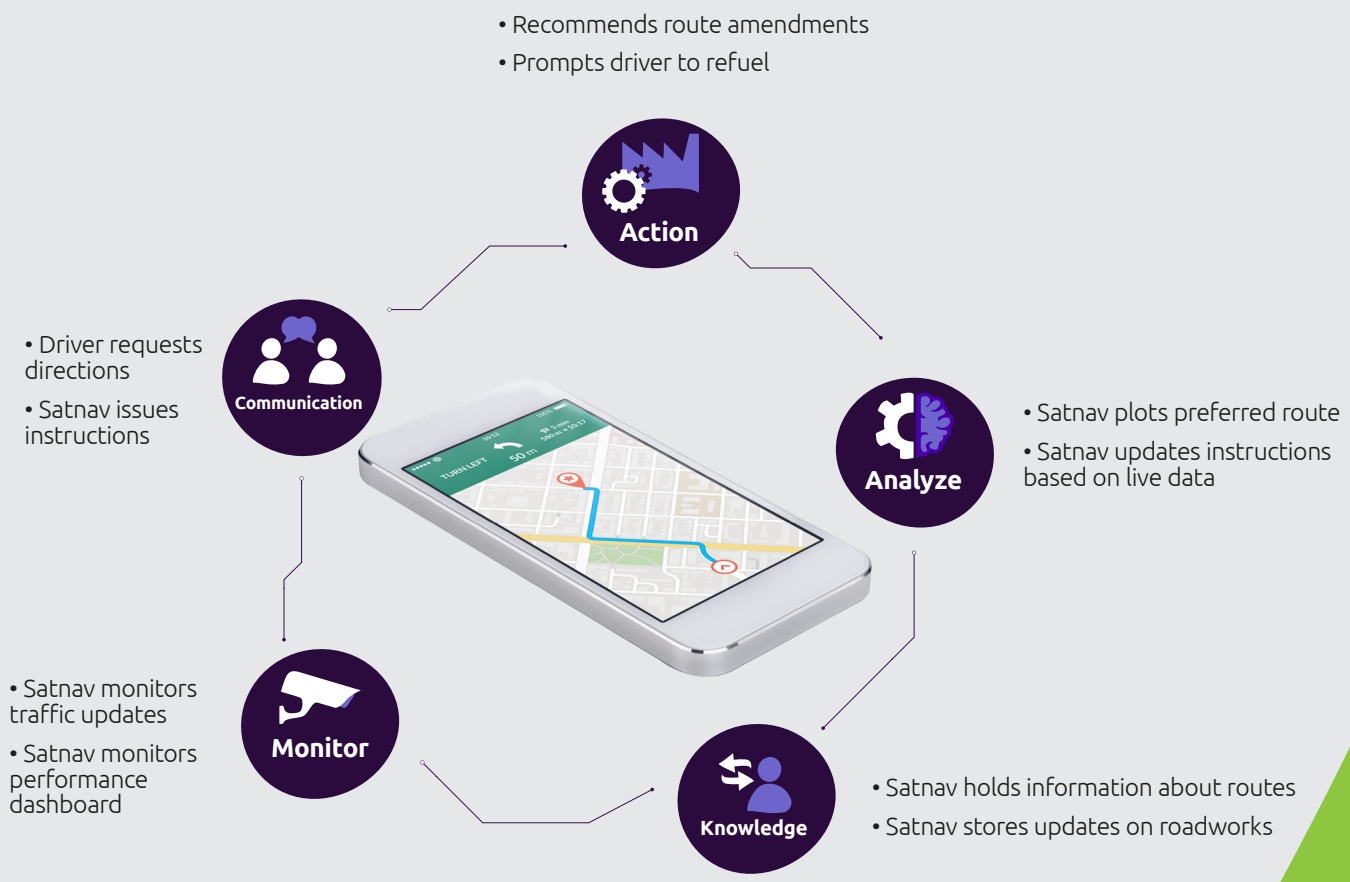

Figure 2. The "Five Senses of Intelligent Automation" used in an in-car navigation system

> *A powerful new alliance is emerging between the individual and technology. This is liberating people's time and allowing for more choice and creativity in the workplace."*

Christopher Stancombe
Executive Vice President, Capgemini

How organizations can benefit from a new alliance between humans and machines

Bringing people and technology together

In the first chapter, we looked at the history, development, and progress of AI – and how it is creating new opportunities for organizations.

In chapter two, we introduced a simple framework to make AI more accessible to all of the individuals within an organization by comparing AI to the five senses of human intelligence.

In this chapter, we will consider how AI technologies are also creating new opportunities for individuals in the workplace.

In the age of hyperintelligence, it is not just about what activities people can complete based on their own knowledge – it is also about how they use their skills and experience to access and apply knowledge available on their organization's intranet or the global internet to create value.

This is leading to a fundamental shift in the roles of individuals and managers that suggests organizations should consider transforming their operating models to match the "*Five Senses of Intelligent Automation*"

Enhancing the role of the individual

A powerful new alliance is emerging between the individual and technology. Machine intelligence is augmenting human intelligence and expanding the limits of what individuals can achieve. This is liberating people's time and allowing for more choice and creativity in the workplace.

Machines can do certain activities quicker and more accurately than people – such as processing and analyzing data. This revolution is less about doing the same things cheaper or completing activities faster, and more about freeing people from tasks better suited to machines. It enables people to augment their skills and knowledge and to rebalance their workload – such as taking more time to focus on driving insight and determining the next best action, rather than populating and manipulating spreadsheets.

The era of the "Google worker"

Until recently, people have generally required personal knowledge to generate value for the business – or been reliant on the willingness of managers to share their skills and experiences.

Knowledge is now more open and accessible to everyone. We all use the likes of Wikipedia, online dictionaries, and YouTube to develop new skills and tackle new challenges with confidence. We no longer need to hold knowledge in our memory, but to understand the relevance of the information we find. Improvements in connectivity are also creating networks that facilitate closer collaboration with different people, which is broadening our effective knowledge.

As such, people at work are becoming less concerned about what they know, and more interested in developing new skills to identify opportunities and solutions that will deliver value. Traditional workplace boundaries are disappearing. Individuals are resetting their expectations for what they are able to achieve. Individual knowledge is less of a differentiator when it is stored in a database and readily accessible through a search engine. There are fewer limitations and far more opportunities. As long as they are delivering value, people can apply their creativity and act on their ambitions like never before.

Across all industries and services, we are going to see a new generation of Google workers emerge – people who proactively use AI tools to enhance and augment their skills and knowledge.

Established training and education will need to change radically to enable and encourage this release of potential. Managers will need to adopt a new approach to support their teams, and organizations will need to consider new operating models.

Rethinking the role of managers

In the age of hyperintelligence, where the role of the individual has changed significantly, it follows that the way they are managed and measured must also be revised.

Managers of the future will continue to be valued for their own individual contribution and that of their team. However, the measures of that contribution will change to include things like:

- Value added to the organization and its customers
- Behaviors exhibited (more creativity and innovation)
- Leadership demonstrated to drive change.

They will have to embrace the age of the Google worker to create synergies within teams and juxtapose different skills to create differentiation.

The role of the manager will be about encouraging, supporting, and enabling individuals, exploring new ways to engage them and helping identify the greater contributions they can make to the business.

Less supervision, more trust

The relationship between manager and individual will change too. Rather than instructing people how to work and looking over their shoulder to ensure they have remembered, managers will need to let go and trust them to find their own answers. They will still need to hold people to account for their performance, but the focus will be on outcomes achieved, rather than traditional metrics such as attendance and efficiency.

As people adopt AI technologies to augment their performance, the organization will start to depend on more valuable contributions from them. Therefore, the fundamental purpose of a manager will evolve to be the enabler of change, as well as stability, within their environment.

Shaping the organization around the "Five Senses of Intelligent Automation"

Legacy businesses are traditionally organized around core functions such as customer services, finance, HR, and supply chain, with tasks and data managed in silos. However, by adopting a new operating model that's organized around the "*Five Senses of Intelligent Automation*", better connections can be formed within and between those functions to create a hyperintelligent enterprise (see Figure 3).

As we have seen, ***knowledge*** is key to hyperintelligence. It needs to be consolidated into one central function, rather than being spread across different teams. Improvements in ownership and accountability lead to clearer governance and control, resulting in enhanced integrity and quality of knowledge, enabling better and quicker decisions. This is the approach that "native" AI companies such as Amazon and Google take.

Native AI companies also employ various ***monitoring*** functions that track their employees' use of knowledge as well the demand, questions, and feedback from their customers. An example is the use of HTTP cookies, which track browsing activity and provide companies with a greater understanding of what people are looking at over time to enrich their knowledge base.

This knowledge is then fed into models that ***analyze*** customer activity and predict future purchasing decisions. This insight may result in ***communication*** with the customer to recommend a combination of relevant, complementary, and substitute products or services.

If this leads to an order, it will be routed to the relevant supplier and fulfillment partner to ***act*** appropriately to meet the customer's requirements.

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> *Head of Europe, Capgemini's Business Services*

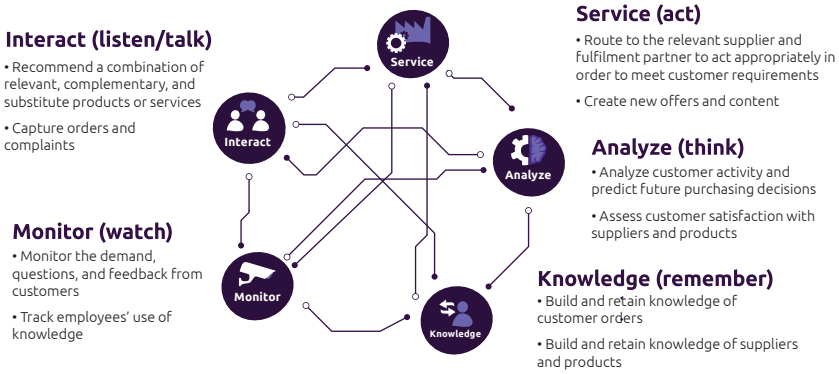

Figure 3. Shaping the organization around the "Five Senses of Intelligent Automation"

AI at work – demand-driven knowledge

At Capgemini, we are using a corporate knowledgebase to support 15,000 associates who deliver finance and accounting (F&A) services. This has benefits for people, managers, and overall business outcomes:

- Individuals can complete their tasks with reliable knowledge and are no longer constrained by their ability to remember or their manager's willingness to share the right training. Work instructions are easy to locate and rated for their ease of understanding, allowing individuals to explore new areas and learn faster.
- Managers have increased confidence knowing that their teams have reliable information, and they also benefit from clear visibility on what their people don't know. Seeing what questions are trending and the root cause of those trends allows managers to create effective training interventions and identify latent problems in performance or disruption in the client environment.
- The organization has increased confidence that the right knowledge is being deployed effectively, and that knowledge is no longer dependent on specific people. Better management of knowledge leads to improved client satisfaction and new services..

> *"The primary benefit of robots is to help free up people's time from doing repetitive and/or mundane tasks, so that they can focus on adding real value to the new operating model."*
>
> **Xavier Hochet**
> *Head of Europe, Capgemini's Business Services*

Hyperintelligence – step by step

Although it is unrealistic for most legacy companies to transform overnight into a native AI company, they can take a step-by-step approach to hyperintelligence that will help them stay competitive. This could start with the formation of a single function responsible for all of the knowledge in the organization.

For example, we've worked with a leading biotech company to put stronger governance around all of its master data. This ensured that critical knowledge was firstly cleansed and is now managed and enriched centrally, improving completeness, relevance and quality. There is now an organizational trust in the integrity of the corporate knowledge platform that allows timely, informed and aligned decisions to be made with confidence.

Keeping it simple

Organizations in the initial phase of transformation can learn simple lessons from the early adopters as they go about reshaping their operating models to support hyperintelligence:

- **Think technology and people –** AI is bringing benefits to all areas of business, and is transforming (rather than replacing) the role of people. Consider how technology will shift the skills your people need.
- **Be inclusive –** involve a broad group of stakeholders as you start your AI journey, so you can factor in all the different implications for people, managers and organizational functions.
- **Measure impact –** thanks to the reducing cost of automation technologies, you can start valuing people on metrics such as customer satisfaction, rather than attendance and efficiency.

The next chapter, we will look at the flexible infrastructure that underpins AI and how it is widely accessible today, enabling businesses to implement their own solutions quickly and without deep technical expertise.

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The infrastructure of AI – the technology that is enabling our imagination to become real

Hyperintelligence awaits

As progress in technology infrastructure marches rapidly on, more and more businesses are embracing AI to enhance their competitiveness.

Improvements in connectivity, storage capacity and processing power at lower costs are enabling this revolution.

New developments in cloud, wireless networks, the Internet of Things, Application Programming Interfaces (APIs), quantum computing, and microservices – to name just a few – are working together to build the hyperintelligent enterprise.

In this chapter, we'll look at the infrastructure approach needed for success.

> *"Hyperintelligent organizations are transitioning to an infrastructure that delivers the speed, responsiveness, and reliability modern consumers and employees expect"*
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> **Xavier Hochet**
> *Head of Europe, Capgemini's Business Services*

The story so far

Digital technology has changed nearly every facet of our lives – but what's enabling it?

Behind all of the solutions that recognize our faces, that tell us what and whom we are going to like, that provide instant search results and real-time electronic payments, lies the infrastructure of intelligence.

In the past, the mainframe was the mainstay of the infrastructure landscape. While that era should be long gone, many industries still rely on large, monolithic solutions running on infrastructures that are costly to maintain, rigid in their architecture, and too restrictive for the new digital age.

Hyperintelligent organizations are transitioning to an infrastructure that delivers the speed, responsiveness, and reliability modern consumers and employees expect – an infrastructure that can receive, store, and instantly recall the ever-increasing quantities of data that today's AI solutions rely on.

The new landscape is characterized not by monoliths, but by nimble, modular technology. By adopting a "building block" architecture that supports continuous development and dynamic adjustment, resources can be added and removed quickly and affordably. This enables organizations to embrace intelligent solutions today, whilst future-proofing their infrastructure for the developments of tomorrow (see Figure 4).

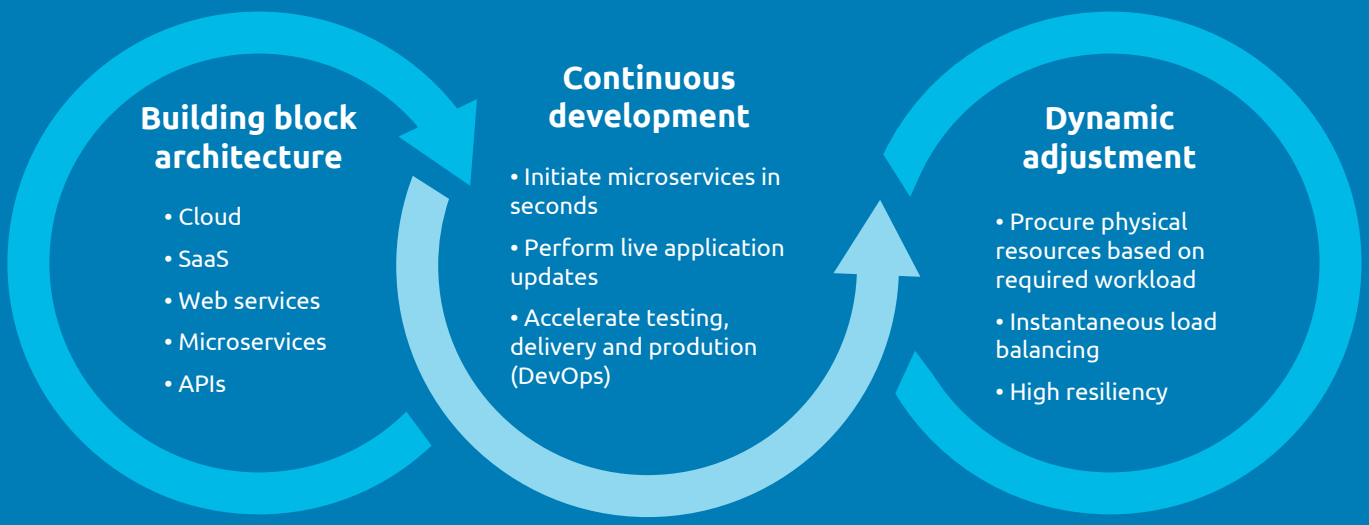

Figure 4. How organizations leverage modular technology to embrace intelligent solutions

The new age

Most businesses now use Software-as-a-Service (SaaS) solutions, hosted in the cloud. This has become the standard mode of software distribution, replacing on-premises installations using CD-ROMs and floppy disks.

However, there is a major difference between subscribing to SaaS applications and completely redesigning your infrastructure around what the cloud can offer.

Organizations that choose to go "native" with cloud can achieve a broader range of benefits and help transition to an AI-first future. That's because of the range of functionality that is now available on the cloud in the form of web services and microservices.

Building block architecture

Constructing a complete business process or application can be as simple as selecting functional modules from a catalogue and assembling them in the same way you would put together Lego blocks.

These independent building blocks communicate with each other using APIs. Many APIs are freely available on the market, in an open and standardized format – enabling you to link to new applications easily and affordably. You can also use them to incorporate new microservices into an existing application chain, to get more value out of your existing enterprise solutions.

Microservices and APIs give confidence in the ability of constantly evolving solutions to continue to thrive in a constantly evolving ecosystem.

Continuous development

APIs eliminate the need to recode and retest a microservice every time it gets updated or replaced.
In fact, it can take as little as 15 seconds to initiate the production of a microservice or to execute an application update in a building block architecture.

Compare this to a traditional legacy environment, where it could take as much as 12 months of development and testing to update a core in-house business application.

Digital businesses update their critical applications millions of times each year using the modular flexibility of microservices and APIs.

Such dramatic shortening of production cycles allows for more frequent – even real-time – application development. This helps ensure key systems meet the evolving requirements of the business, the changing expectations of customers, and the latest technological advances.

Dynamic adjustment

A further benefit of the cloud and microservice-based architectures is the ability to procure dynamically physical resources based on exact workloads.

Today, most businesses still over-resource each application to ensure uptime. They clone their production environments to respond to a potential peak in demand. If that peak never happens, they are paying for unused resources. However, that has to be balanced against the risk that if demand exceeds the predicted maximum level, the core applications could fail – causing untold reputational damage and lost revenue.

Alternatively, microservice-based applications operate in their own independent software container, which determines the resources required for its own execution. When demand peaks, the required microservices are replicated automatically to take up the load. When the peak has passed, the duplicates are destroyed, and the resources are made available to other applications.

Today's leading e-commerce and streaming sites use dynamic adjustment techniques for instantaneous load balancing to keep their services online even at peak times.

Don't forget the data

When thinking about new forms of infrastructure, it's important to remember that we are in a new age of technology, where data quality and security is everything.

Data becomes knowledge that provides valuable insight into business operations. Acting effectively on that insight can help an organization differentiate itself and create new value.

Data, knowledge, and insight are not static, but are constantly in flux. Any organization that is rethinking its infrastructure design must also consider how it will collect, process, exploit, and circulate them in a secure and effective way.

the next chapter, we will explore how the use of AI allows organizations to shift their focus from efficiency to effectiveness, leading to far richer user experiences and better business outcomes.

No more compromise between user experience, efficiency, and effectiveness

Previously we looked at the *flexible infrastructure of AI* that's accessible to companies today – and how this is accelerating a shift to hyperintelligent enterprises. We now consider the consequences of AI on that most common of enterprise projects – business transformation.

The traditional approach to business transformation is to set a future vision of how the enterprise will operate. A time horizon of three to five years is set to prepare for the transition to this new operating model. Wholesale changes occur over this planned transition period, and teams are set goals and milestones.

When successful, it's a careful and considered journey, but common challenges tend to impair progress:

- Internal policy changes to support the overall goals are often not applied or enforced consistently.
- Momentum for change stalls as new business priorities or opportunities arise.
- A poor user experience leads to resistance to change and low adoption of new ways of working.

Transformation that applies an AI-first approach can help overcome these barriers. It allows operating models to be transformed incrementally and with minimal disruption over a shorter period. More importantly, it does not demand compromises to be made between user experience, efficiency and effectiveness.

Business transformation with AI creates new routes to success

A typical traditional transformation plan has a five-year time horizon, characterized by teams working independently on separate project streams. At agreed points in time, the teams come together to report on progress and highlight any issues, delays or dependencies.

Where required, remediation plans are prepared and new milestones are scheduled. Everyone works on their separate streams until the next meeting. It is a linear or waterfall approach, driven by time, goals and budgets. This is often represented visually in the form of a "T-Map" see Figure 5).

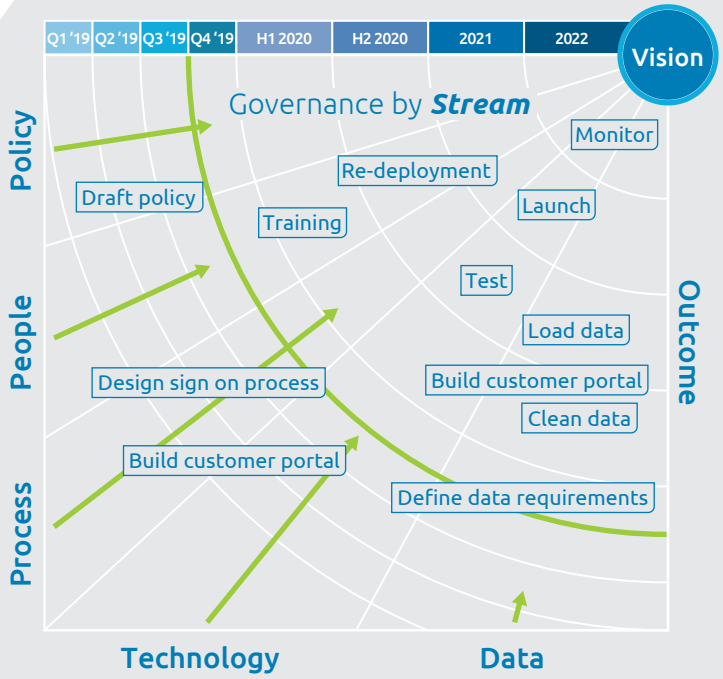

Figure 5. Working as multiple teams focused on time based deliverables

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> **Christopher Stancombe**
> *Executive Vice President, Capgemini*

In contrast, an AI-driven transformation plan drives incremental changes using cross-functional teams working in an agile manner. There is shared buy-in to agreed outcomes and success is measured by adoption and customer/user feedback, rather than the completion of milestones across separate workstreams. The "AI T-Map" below (see Figure 6) shows how this differs from the traditional approach.

Take the example of an organization that wants to transform its customer journey and offer the most user-friendly signup experience. First, it needs to apply design thinking to create the "golden path" for new customers by adopting an AI-first approach. This will define a new operating model and involve changes in policy, people, process, technology and data to transform the way that the service is delivered.

To be successful, multi-disciplinary teams must work together, sharing knowledge and collaborating on tasks. Incremental progress is made as they align different parts of the operating model, including the required adoption of policy changes, to deliver the improved experience. Rather than working linearly and reporting back at set times, they will be working in an agile way to deliver agreed outcomes as a team, testing changes and taking customer/user feedback as they proceed.

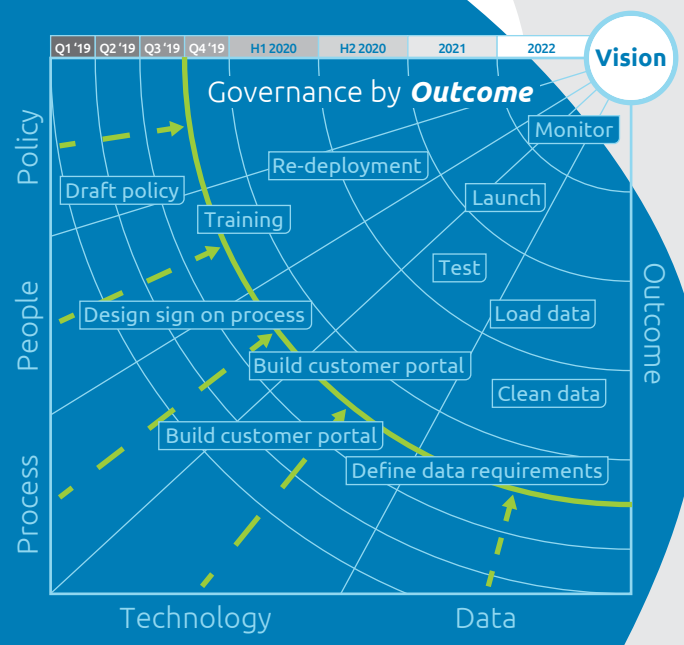

Figure 6. Working as one team focused on business outcomes

An AI-first approach delivers a better user experience, but also improved efficiency and effectiveness

Transformation programs have typically focused on efficiency. Applying "lean" methods to processes has helped to cut waste and reduce cost, but often at the expense of effectiveness (service levels) or customer/user experience. However, businesses are increasingly measuring their success by the *quality of their customer feedback*, using tools such as net promoter score (NPS). This is driving an AI-first approach to transformation, ensuring that user experience and effectiveness (both of which result in incremental business value) are prioritized in the program goals – whilst continuing to deliver cost efficiencies.

In a survey carried out by Capgemini last year, the leading adopters in driving AI transformation identified the need for a methodology framework and multi-disciplinary teams as their two critical success factors.

We use the *"Five Senses of Intelligent Automation"* framework to facilitate a design-thinking approach, prioritizing technologies that enable businesses to build scalable operating models that improve how they:

- **Monitor** what's happening in their environment.
- **Communicate** and interact with customers/users.
- Store data and enrich their **knowledge** repository.
- **Analyze** that knowledge to form insights.
- **Act** on the insights to improve operations and outcomes.

This is how we create and improve the "golden path." Multi-disciplinary teams apply design thinking to establish the best experience from a user perspective in the five areas above, both from a standalone and a combined point of view. They then consider how new AI technologies can support those objectives. Instead of focusing on individual processes and viewing them as a linear discrete journey, they look at the whole connected experience.

When making this transition to a hyperintelligent enterprise, tools such as Celonis (a process-mining application) can automate the monitoring and analysis of transactions. Tracking and understanding deviations from the "golden path" enables further improvements to be made to the new operating model, including compliance with required policy changes.

AI creates a portfolio approach to transformation

Using AI-first design thinking to create a new business operating model requires the adoption of an agile portfolio approach to transformation (see Figure 7).

This approach will yield benefits more quickly and with less business disruption than, for example, five-year ERP-led transformations or two-year offshoring programs operating in isolation.

Multiple projects are integrated and run simultaneously, bringing high-value business improvements that enhance the user experience and deliver incremental value, whilst optimizing existing investments.

The classical approach to transformation in the West is to drive through large-scale change in pursuit of specific results. Whereas in the East, transformation is more of a continuous process that embraces emerging opportunities. AI-first transformation blends the best of both approaches. It allows organizations to make considered, incremental changes over time that align to their longer-term transformation goals.

ERP-first transformation

- Needs large investment
- Has a long payback period (3–5 year time horizon)
- Focuses on efficiency rather than user experience
- Demands strong enforcement of policy
- Leads to compromise between user experience, effectiveness and efficiency

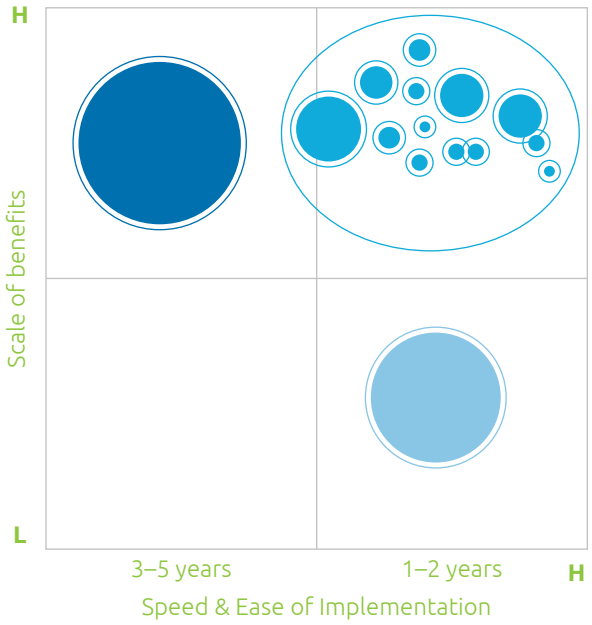

Figure 7. A portfolio approach to transformation

AI-first portfolio characteristics

- Requires a new methodology/framework (the "Five Senses of Intelligent Automation)
- Uses multi-disciplinary teams (DevOps)
- Applies design thinking
- Focuses on customer/user experience outcomes
- Measures success with AI SMART

Offshoring-first transformation

- Delivers one-time cost reduction before business improvement
- Captures departing resource knowledge in DTPs
- Impacts phasing of other operating model changes
- Embeds strong global process ownership
- Separates function/service from the business

> *In a survey carried out by Capgemini last year, the leading adopters in driving AI transformation identified the need for a methodology framework and multi-disciplinary teams as their two critical success factors."*

Xavier Hochet
Head of Europe, Capgemini's Business Services

Start now, start AI SMART

Early adopters of AI also identified the setting and measurement of clear objectives as key enablers for the success of their AI transformation programs.

We recommend an AI SMART approach to making sure that any measures align to the following criteria:

- **S – Strategic –** ensure that the design principles for the transformation contribute to the strategic vision for the enterprise
- **M – Motivational –** communicate positive messages to a broad cross-section of the organization to make sure that changes to ways of working are understood and fully supported
- **A – Adoption –** rather than allow exceptions to the new operating model, fix the root causes for deviation and reward compliance
- **R – Relevant –** priorities impacts on customer satisfaction and service levels and not just cost reduction
- **T – Technology –** use tools like Celonis to automate monitoring and analysis.

Making the vision a reality

In this chapter, we have introduced the concept of AI-first transformation. This is inspired by our strong belief in the power of design thinking. It emphasizes the need to visualize the AI outcomes required to achieve successful business transformation in the new age of hyperintelligent enterprises.

This AI-first transformation approach is supported by two distinct methodologies. The first of these was explained in *chapter 2* and is applied in the design phase to create a vision of the future operating model. An example of this would be the "golden path" of a transaction or interaction that we considered earlier.

In the next chapter, we will introduce our second methodology, which is used during the implementation phase to turn the design into a reality. It is called our ESOAR approach, and it comprises the following five steps:

- **Eliminate –** Eliminate all unnecessary and sub-optimal transactions/interactions
- **Standardize –** Standardize the operating model for the golden path
- **Optimize –** Optimize existing investments
- **Automate –** Automate to create new AI solutions
- **Robotize –** Robotize where appropriate

ESOAR is complementary to the "*Five Senses of intelligent Automation*" design methodology, and the best results are achieved when they are operated together. When design and implementation teams work jointly throughout the transformation journey, incremental changes can be made with confidence, whilst delivering step-change improvements in service delivery.

> *"When implementing an AI-first transformation, you should take the opportunity to identify and eliminate all unnecessary and sub-optimal transactions/interactions."*
>
> **Xavier Hochet**
> *Head of Europe, Capgemini's Business Services*

Implementing artificial intelligence successfully

In the previous article, we looked at how AI is enabling organizations to deliver business transformation quickly, incrementally, and effectively, with minimal disruption and a positive impact on the customer/user experience.

Using design thinking to optimize outcomes delivered by AI through "golden paths," businesses can use a portfolio approach to transformation that will achieve better value. This leads to faster user adoption, the confidence to change and enforce policies to drive fewer exceptions, and enhances the benefits of the transformation.

Customers and users now expect businesses to deliver continuous transformation, using AI to enhance their experiences. Businesses that don't will become laggards, exploited and cannibalized by new AI-native entrants as well as their more AI-capable established competitors. This was reinforced in the *responses to a survey that Capgemini conducted in 2017* with early adopters of AI-first transformation.

> *"Transformation often fails at the implementation stage due to a lack of alignment between the solution and the business priorities."*
>
> **Christopher Stancombe**
> *Executive Vice President, Capgemini*

The challenges of implementing transformation

In our experience, transformation often fails at the implementation stage due to a lack of alignment between the solution and the business priorities. It is important that the implementation team works with the design team to avoid the following pitfalls:

- **Designing for exceptions –** solutions are too often designed to allow for failure. A fallback mechanism is included in case the golden path fails, such as a call center facility as a backup for the website or mobile app. The solution becomes too large and complicated, the implementation becomes time consuming and costly, and the project loses momentum
- **Measuring the wrong things –** solutions are prioritized and selected for their impact on efficiency rather than delivering a better customer/user experience. This leads to negative feedback and poor adoption from users leading to new workarounds and patches. The implementation loses business support and fails
- **Internal competition and lack of alignment –** compromises are made on the chosen solution and no one takes ownership of the resulting sub-optimal design. The individual components may be excellent, but there is no synergy and the whole is less than the sum of its parts. For example, IT may have a preference for implementing standard out-of-the-box functionality that could conflict with the expectation of the business for a high degree of customization.

To help avoid these challenges, we use an implementation methodology called ESOAR (see Figure 8). This helps the implementation team challenge the design team constructively to minimize potential failure.

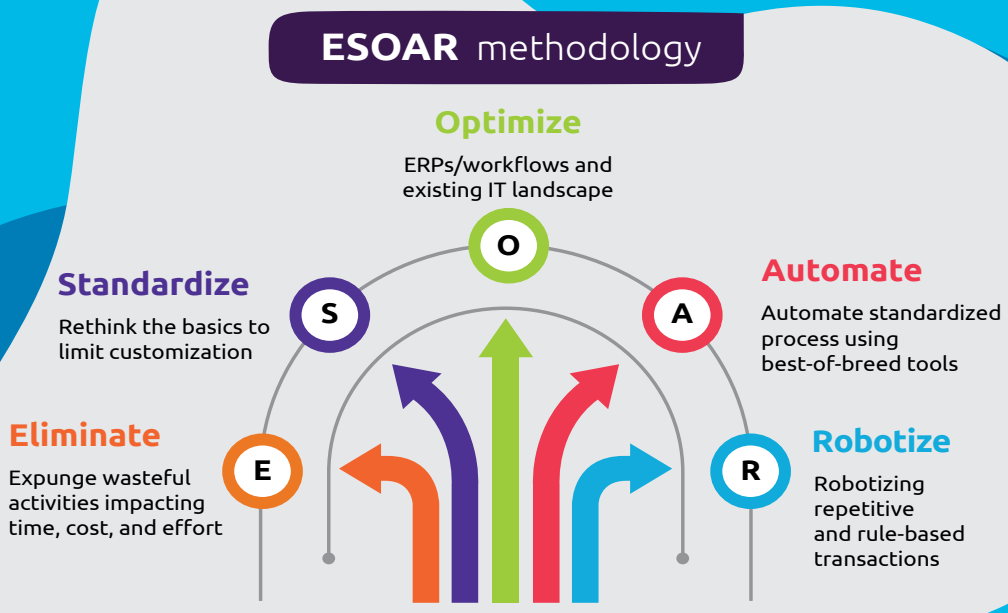

Figure 8. Capgemini's ESOAR methodology

E is for Eliminate

When implementing an AI-first transformation, you should take the opportunity to identify and eliminate all unnecessary and sub-optimal transactions/interactions. Focus on keeping customers/users on the golden path and refuse to design for any task, activity or service channel that falls outside that ideal.

For example, if you have a golden path for signing up new customers via a mobile app, but customers are still phoning your call center, then you could stop publishing the phone number and/or have a recorded message that points them to the app. Otherwise, you will be using valuable resources to support a sub-optimal service.

When you make your golden paths intuitive, fast, and effective, then all other pathways can be removed. Your customers/users will get the best possible experience and you will save costs. It is likely that more than 80% of your transactions already follow a golden path – but don't stop there. Improve the experience further, stop the root causes for exceptions and drive compliance to 100%. If you don't, you risk a competitive decline in your core customer/user satisfaction.

Stopping your transformation teams from planning for exceptions will require clear corporate policies that reinforce the business strategy. Your design and implementation teams can then focus on areas that create business value with high business volumes. As a result, the transformation activity will deliver early benefits to important stakeholders and gain positive momentum.

> *"ESOAR is complementary to the 'Five Senses of Intelligent Automation' design methodology, and the best results are achieved when they are operated together."*

Xavier Hochet
Head of Europe, Capgemini's Business Services

S is for Standardize

After the elimination phase has removed all the unnecessary and sub-optimal activities, you should be left with a list of "golden paths" for your transactions and interactions. This list must be validated by a broad representation from the business, who should approve standards for customer/user experience, effectiveness (service levels), business value, and efficiency.

These standards create the parameters for the minimum viable outcome of the transformation. The implementation should not proceed unless these key measures of success have been documented, reviewed, and approved.
A set of standardized golden paths with expected outcomes will give clarity and focus to the implementation team. They are able to quantify what success looks like and discourage non-compliance. This will stop you measuring the wrong things, and ensure your solutions are better aligned to business priorities, and lead to good feedback and higher adoption from users. Your implementation will gain support and be viewed as a success.

Standardization is too often associated with poor user outcomes, this is generally a result of setting the wrong standards, rather than a reflection on the effort to standardize.

O is for Optimize

The standards created in the previous phase are used as design criteria to optimize the new operating model. Traditionally, this was done by:

- Revising the processes
- To reduce the amount of human activity
- And supporting this with technology.

AI-first transformation reverses this approach. It uses the "*Five Senses of Intelligent Automation*" framework to:

- Put technology at the heart of the solution. This recognizes that machines can perform some activities significantly cheaper, quicker, and more effectively than people
- Re-focus human involvement in areas where they can best impact outcomes and add value. Humans and machines establish a new balance in their respective activities
- Change underlying processes to support the new operating model.

Businesses are likely to have invested significantly in their existing operating model, and quick wins can be realized by repurposing these assets. Involving the owners of existing assets in the optimization phase can reduce internal competition and create better alignment of purpose. Compromises may be made initially on the implementation, but they must be steps towards the ultimate transformation objective. New investments can be used to improve, augment, and/or replace these assets as appropriate to drive synergies and deliver the minimum viable outcomes.

Aligning all internal stakeholders around the optimized transformation will build strong ownership of the solution and the implementation plan to deliver the outcome. The individual components will work better together to deliver synergies, and the whole will be greater than the sum of the parts.

> *"Businesses are likely to have invested significantly in their existing operating model, and quick wins can be realized by repurposing these assets."*
>
> **Christopher Stancombe**
> *Executive Vice President, Capgemin*

A is for Automate (intelligently)

As discussed in the infrastructure of AI, the new technology infrastructure landscape is characterized not by monoliths, but by nimble, modular technology. By adopting a "building block" architecture that supports continuous development and dynamic adjustment, resources can be added and removed quickly and affordably.

APIs are used to connect modules that enable the transformation team to continuously update the underlying technology. This may be done by introducing new tools or enabling functionality embedded in existing tools that had not previously been utilized.

The transformation team should plan to prioritize the implementation of tools that add intelligence or new functionality to the solution. It could be a chatbot that gives customers real-time transaction updates, or a data mining tool to augment the expertise of an advisor with real-time insights drawn from a knowledge repository. Customers and users should experience a constantly evolving richness in their interactions.

R is for Robotize

Finally, the team will start to deliver robots. These will not be visible to customers/users, and are simply used to improve the efficiency and effectiveness of the now well-established solution.

The primary benefit of robots is to help free up people's time from doing repetitive and/or mundane tasks, so that they can focus on adding real value to the new operating model.

Implement change with confidence

AI-first transformation requires strong cooperation between the design and implementation teams. They need methodologies and frameworks that support their work and create a common understanding to enable good communication.

That is why we recommend complementing the "***Five Senses of Intelligent Automation***" framework for design with the ESOAR methodology for implementation:

- **E –** Eliminate all unnecessary and sub-optimal transactions/interactions
- **S –** Standardize the golden paths for transactions/interactions
- **O –** Optimize the solution using existing investments to drive quick wins
- **A –** Automate intelligently to create new AI solutions
- **R –** Robotize where appropriate.

The opportunity to create artificially intelligent solutions to improve customer/user experiences and add value to the business must be seized by the transformation team. Committing to perform each of the ESOAR steps thoroughly and in the correct sequence is critical to maximizing the chances of success.

> *"Committing to perform each of the ESOAR steps thoroughly and in the correct sequence is critical to maximizing the chances of success."*
>
> **Christopher Stancombe**
> *Executive Vice President, Capgemini*

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