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Foundational AI: The Future of Enterprise Efficiency

Leveraging Whole Company Data for Whole Company Productivity

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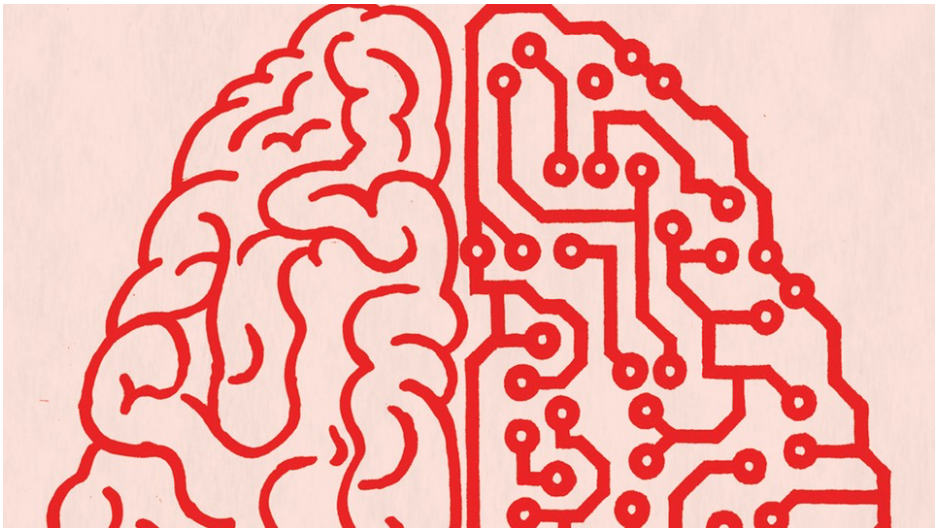

Abstract
In today's rapidly evolving business landscape, organisations face numerous challenges, primarily centering on productivity losses exacerbated by manual data handling, inefficient system integration, and slow adoption of advanced AI tools. Businesses, especially within the shipping, insurance, commodities, and logistics sectors, report significant inefficiencies due to repetitive tasks, fragmented systems, and poor data management. The rise of artificial intelligence (AI), from rule-based automation in the 1990s to the transformative capabilities of generative AI (Gen AI) offers promising solutions.

Generative AI has proven beneficial across various business functions, enhancing customer service, cybersecurity, digital assistance, content creation, and more. However, despite these advancements, a gap remains in aligning AI solutions with

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specific enterprise needs, calling for more intuitive and integrated AI applications.

Foundational AI (FAI) represents a significant advancement, integrating whole company data (WCD) with advanced AI technologies to create a cohesive, adaptable system that supports enterprise-wide decision-making and automation. By centralising AI-driven analysis and utilising a natural user interface, FAI transforms operational efficiency, enabling businesses to overcome productivity challenges and achieve more seamless human-machine teaming.

The implementation of FAI involves initial data ingestion and mapping, continuous adaptation, and eventual autonomous operation that promises over 60 percent reduction in time spent on manual tasks. Early adoption of FAI, supported by a structured implementation strategy, positions enterprises to harness the compounding benefits of AI, driving sustained productivity and competitive advantage in an AI-first world.

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Introduction

Problems Currently Faced in Business

In today's fast-paced business landscape, organisations are grappling with a pressing challenge: the relentless pursuit of efficiency in the face of evolving markets, technological disruptions, population pressures, environmental changes and increasingly complex operational landscapes.

The primary challenge confronting enterprises today is a loss of productivity. Following discussions within the shipping, insurance, commodities and logistics industries, numerous problems have been identified, including:

- 90% of employees are frequently burdened with boring, recurring tasks
- People spend up to 50% of their day on manual data handling
- People often handle too much information, and multitasking is not as effective as it may seem
- Data is imperfect and needs manual cleanup and entry
- Companies use between 15 and 20 systems in combination to run the business
- Systems are designed to aggregate and optimise a narrow set of tasks for a given industry
- Tools are largely built for singular use cases, with problem-by-problem solutions delivering incremental gains that only address narrow business objectives that are non-scalable across the enterprise
- Critical knowledge sharing is challenged as an organisation grows
- Adoption of new AI tools is slow because of high barriers to entry including implementation costs, lengthy integration processes and data sharing and security concerns

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The Rise of AI in Business

"The future belongs to those who embrace innovation as a means of transformation." BCG, 2024

Since Alan Turing first proposed the idea of machines simulating human intelligence, it has taken many decades for continuous developments in computing capacity, algorithms, training data, skill levels and digitalisation to progressively unlock the power of AI for commercial use.

From Rule-based Automation to Generative AI

The 1990s was a significant period for the development of automation with the emergence of Business Process Management (BPM) aiming to optimise and manage business workflows. BPM - sometimes used interchangeably with business process automation (BPA) – is a framework for streamlining business processes to reduce costs, improve quality and gain maximum efficiency. It takes an in-depth look at how processes are currently operating, highlighting areas for improvement, and building solutions, usually from the ground up using rule-based logic.

But while BPM excels at handling predictable, linear processes, it struggles with less predictable, non-linear journeys that involve multiple touchpoints and interactions across various channels. It also relies heavily on accurate data for process mapping and performance measurement.

In the early 2000s Robotic Process Automation (RPA) emerged as a tool for automating repetitive, rule-based tasks within the BPM framework. Taking a tactical approach to automating specific repetitive tasks within broader business processes, its logic relied on predefined workflows and struggled to handle complex decision-making or unstructured data, areas where AI excels (Das & Dey, 2019).

"AI Technology is exceptionally expensive, and to justify those costs, the technology must be able to solve complex problems, which it isn't designed to do." Covello, 2024

But it wasn't until the 2010s that the integration of artificial intelligence (AI) and machine learning into workflow and automation tools allowed for more complex and intelligent automation solutions. This period saw a significant increase in the adoption of workflow automation across industries, driven by the need for efficiency and digital transformation (McKinsey, 2020).
In 2020 this adoption rate was greatly accelerated with the COVID-19 pandemic as businesses sought to adapt to changing market conditions and remote work. AI tools became integral for automating customer interactions, managing supply chains, and optimising operational processes (McKinsey 2020).

The introduction of generative AI models, such as OpenAI's GPT-3 in 2020, and later versions, further transformed the AI landscape, enabling more sophisticated applications, built with transformer models, in content generation, customer engagement, and data-driven decision-making. The release of ChatGPT in late 2022 also ensured that Generative AI (Gen AI) garnered widespread interest across the business and consumer landscape, with individuals from various industries and seniority levels incorporating its 'predict the next token' approach into both professional and personal contexts.

Based on large language models (LLMs) pre-trained to understand general patterns and relationships in human communications, Gen AI tools can help business generate various forms of content including email drafts, summaries of meeting transcripts, and draft outlines for projects. A significant 79% of respondents report having some exposure to generative AI either in their work or personal lives and 22 percent state that they regularly use it in their professional activities (McKinsey & Company, 2023).

How Businesses are Using AI Today

In 2017 McKinsey estimated that AI automation alone could raise global productivity by as much as 1.4 percent. This amount was more than doubled to up to 3.4 percent in their June 2023 report on the economic potential of Gen AI. The sharp uptick in adoption and use of Gen AI tools has helped various industries see the potential efficiency gains in existing workflows.

A survey conducted by McKinsey revealed that one-third of organisations claim to regularly utilise Gen AI in at least one business function. Additionally, 40 percent of respondents indicated that their organisations planned to increase overall AI investments due to advancements in Gen AI. Experimentation with AI tools is prevalent, and it is widely believed that these new capabilities will transform entire industries and job responsibilities.

In a survey of 600 business owners the Forbes Advisor survey highlighted several ways business owners are using AI, including:

1. Customer Service: 56% of businesses are employing AI technologies like chatbots for instant messaging and support. This enhances customer interaction and satisfaction by providing timely responses.

2. Cybersecurity and Fraud Prevention: Approximately 51% of businesses utilise AI to bolster cybersecurity measures and manage fraud. AI systems can detect anomalies and potential threats more effectively than traditional methods.

3. Digital Assistants: 47% of companies are using AI digital assistants to streamline operations and improve productivity, allowing for more efficient task management and customer interaction.

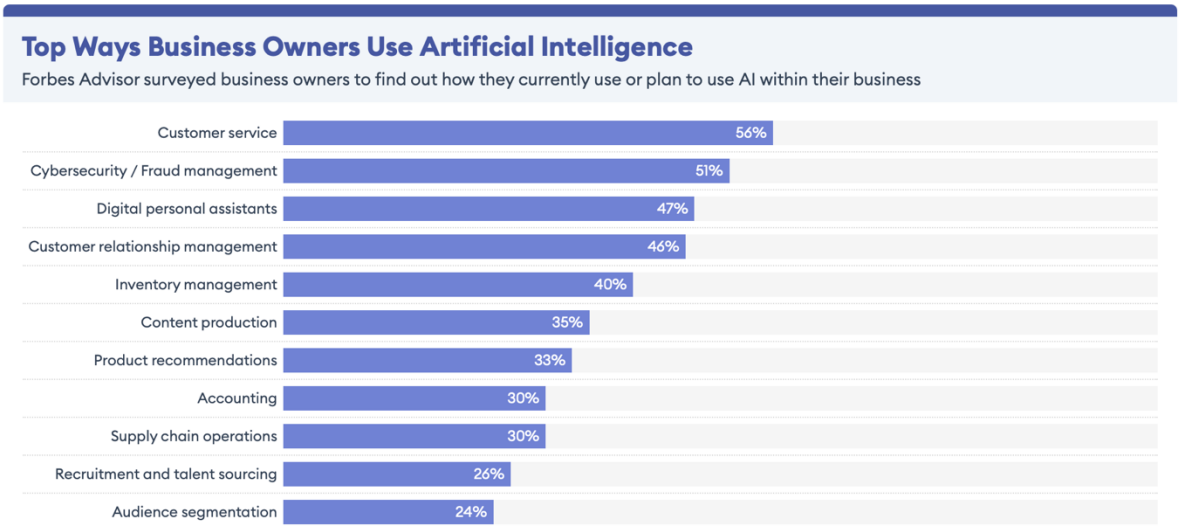
4. Customer Relationship Management (CRM): AI enhances 46% of companies' CRM systems, enabling businesses to personalise customer interactions and predict future behaviors, which can significantly boost sales and customer loyalty.

5. Content Creation: 35% of businesses are leveraging AI for content production, including generating marketing materials and website copy. This not only saves time but also helps in creating tailored content for different audiences.

6. Inventory and Supply Chain Management: AI is applied in inventory management by 40% of businesses, optimising stock levels and improving supply chain operations, which is crucial for reducing costs and improving service levels.

7. Recruitment and Talent Sourcing: AI aids in recruitment processes, with 26% of companies using AI tools to streamline candidate sourcing and selection, making the hiring process more efficient.

8. Data Analysis and Decision Making: AI is increasingly used for data aggregation and analysis, helping 24% of businesses make informed decisions based on real-time data insights. This capability is expected to improve decision-making processes significantly.



How business owners are using AI today (Source)

But while AI adoption in business is experiencing rapid growth, it has still yet to unlock the full value of AI-driven efficiency.

"There is a very small subset of business problems that are best solved by machine learning; most of them just need good data and an understanding of what it means." Lorang, 2016

The Need for More Intuitive and Integrated AI Solutions

Despite the availability of current AI solutions, there is still a gap in how AI technologies align with each enterprise's unique requirements and problems. Many AI solutions are packaged for use within existing systems, rather than adapting to learn how a particular the business operates and working to address its specific needs. This one-size-fits-all approach falls short of providing an effective solution.

> **"The greatest rewards also will go to those who are not afraid to think big. As we've observed, the leading companies are the ones that are focusing on reimagining entire workflows with gen AI and analytical AI rather than simply seeking to embed these tools into their current ways of working."**
> Alex Singla, Senior Partner and Global Coleader of QuantumBlack

The key to unlocking the true value of AI lies in tailoring AI solutions to the specific needs of each company, moving away from the industry's one-size-fits-all approach. By integrating customized AI solutions, businesses can enhance efficiency, make informed, data-driven decisions, elevate customer experiences, and accelerate innovation within the company (*Common Challenges that Businesses Face in AI Adoption and How to Overcome Them*, 2023)

Introducing Foundational AI (FAI)

Defining Foundation Models

Foundation models are large-parameter models that are pre-trained, through self-learning, on diverse datasets to perform a wide variety of tasks across different domains. Examples include GPT, Claude, and Cohere. They have given rise to diverse AI tools and task applications like ChatGPT, Gemini and Microsoft CoPilot, that can perform a range of diverse tasks like text generation, question answering and image creation. Because they are without specific labelling and designed to be general purpose, they are highly adaptable and can be fine-tuned for more specific applications with relatively little additional training. Foundational models are generally acknowledged as a significant evolution in AI, providing greater flexibility, adaptability, and performance across a wide range of applications compared to traditional AI models, which are limited in scope and require more manual intervention.

Whole Company Data + AI Technology + Access + Natural User Interface = Foundational AI

Defining FAI

Foundational AI uses a range of AI technology, including foundational models and a graph database, that is connected to all systems and tools and Whole Company Data (WCD), to create a deep understanding of how an enterprise operates. Its centralised AI core acts as the primary point for AI-driven analysis and decision-making across various departments, transforming the role of AI as an add-on layer in isolated applications and separate departments to a unified, integrated system enhancing the entire organisation's performance, strategy, and human capital through its connection to WCD. A natural user interface further strengthens the unique, customised approach by providing holistic assistance to users in the 'natural' flow of their work, not another platform.
This approach provides a transformational leap in redefining how humans interact with data and systems – from humans acting as the bridge and manual messenger

between various machines and tools to true human-machine teaming where each leverages the strengths of the other.

Key Enablers of FAI

Real-time Access to Whole Company Data: Complexio integrates into all the company's core systems and ingest whole company data – both structured and unstructured. Sources include emails, chat messages, reports, CRM and ERP systems. This approach bypasses the need for additional security and ongoing maintenance.

Proprietary AI Technology: Complexio interprets data utilising a large toolset that includes multiple large language models, large scale data matching algorithms, graph data modeling, business process modelling and a neural training interface. Access to this is secure, closed, scalable, and fast.

Access: Complexio provides access to whole company data via BI tools or API access. This helps business leaders gain insights to the current state of their unique business in a traditional, easy to understand format.

Natural Interface: Complexio provides contextually relevant holistic assistance by understanding what the user will need to do next and assisting them in doing just that. Depending on user needs, Complexio will interface with the company's existing tools and employees to predict, automate, simplify, accelerate, and reduce risk in the business processes.

Benefits Over Traditional Software Systems

"Complexio will change the way humans interact with a computer."

The integration of Complexio's Foundational AI revolutionises how enterprises use, deploy and interact with their own data across all the systems and tools they use to carry out their business activities. Instead of working with incomplete data across siloed systems and disparate teams, Foundational AI provides a central AI-driven business intelligence layer for automation, orchestration, interaction and insights into WCD that leads to more informed and cohesive decision-making. Organisational performance and strategy are enhanced with a cohesive data foundation that is

grounded in 'how things really are', streamlining processes and operational efficiency towards desired states through an automation engine, orchestration layer and natural user interface.

How Does FAI Work?

- **Data Consolidation and Initial Learning:** FAI begins by ingesting and mapping data from various company systems and tools, connecting with structured and unstructured sources to create a unique model of all the business activities an enterprise has, and how it performs them.

- **Pattern Recognition and Predictive Analytics:** As the system gathers more data, it starts to identify patterns, enabling it to predict needs or 'next steps' and automate tasks, effectively reducing the time required for data retrieval and analysis.

- **Continuous Adaptation and Optimisation:** With machine learning algorithms, Complexio continuously refines its FAI methodology, becoming more and more efficient at predicting and serving the data, automations and insights employees need, when and where they need it.

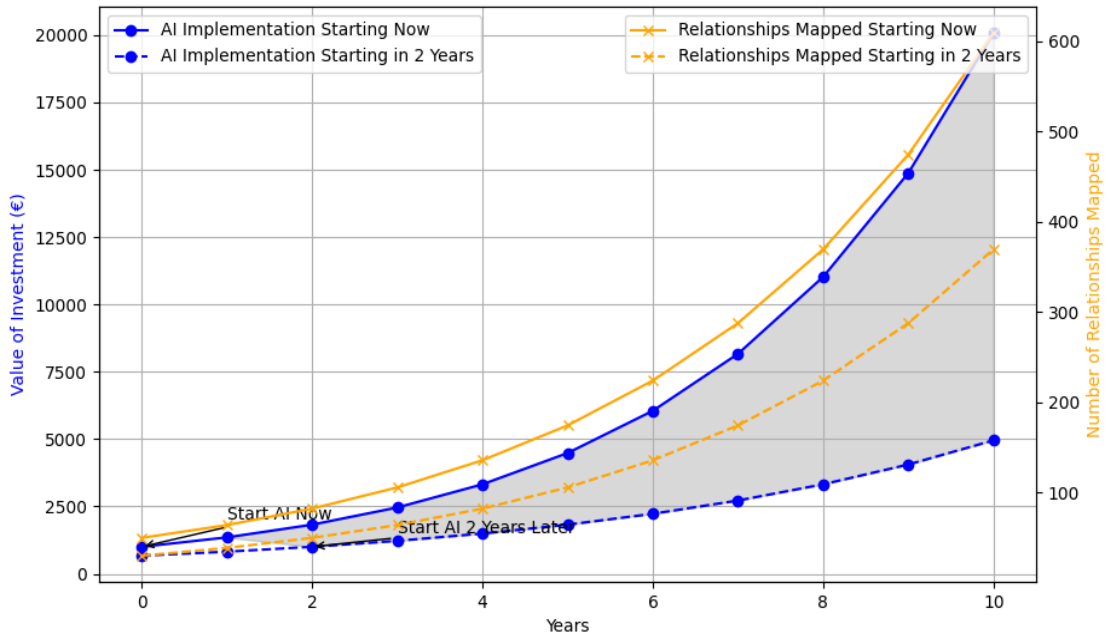
- **Transition to Autonomous Operation:** Over time, Complexio's automation engine takes on more responsibilities, moving toward fully automated processes for certain tasks. It will effectively have all relevant data at its fingertips, ready to be deployed as and when needed to ensure whole enterprise efficiency.

By automating tasks traditionally performed by humans at computers, Complexio aims to reduce the time spent by humans on such tasks by over 60%. The end goal is a symbiotic relationship where humans and machines work in tandem, with AI handling data-heavy and computational tasks, allowing humans to leverage their unique skills in problem-solving, creativity, and emotional intelligence. This human-machine synergy redefines how to achieve workplace productivity and operational efficiency.

Implementation and the Road Ahead

Value of Early Implementation

The value of implementing FAI can best be understood as a system of compounding interest. Productivity gains are delivered from both the initial investment made and the accumulated gains from all other investments that come in subsequent learning loops.



The compounding value can best be understood across two distinct stages – building the FAI model, then leveraging the model with additional capabilities. The initial stage requires an investment in ingesting and mapping whole company data by integrating and connecting to various enterprise systems and tools. Once established, this model builds an ability to automate simple use cases and provide a collaborative 'access' platform from which further informed decision-making can begin.

The second stage of development involves compounding the automation gains from the first stage across deeper, whole company business activities and future contexts. Value comes from improvements made to the existing systems and tools and by connecting unified whole company data to new AI applications and systems to automatically extract greater efficiencies.

Best Practices for AI Implementation

Gartner estimates that 85% of AI and ML projects fail to produce a return for the business. The reasons often cited for this high failure rate includes poor scope definition, bad training data, organisational inertia, lack of process change, mission creep and insufficient experimentation (Forbes, 2023).

To mitigate this, a comprehensive approach for the implementation process is essential. aiSTROM provides a good starting point for this, outlining an 8-part roadmap for success:

1. **Goals** – identify opportunities with clear problem statements and goal descriptions, created by an interdisciplinary team.

2. **Data** – define the data strategy, including data sources, legal considerations and data storage

3. **AI Team** – putting together a team that includes cross-domain capabilities, hiring considerations and acquihires

4. **AI in the Company** – positioning the AI team with a portfolio approach, looking at centralization vs decentralization, agility and in-house vs outsourced

5. **Technologies** – moving beyond plug and play to state-of-the-art, XAI, considering accuracy vs black-box, humans in the loop, augmenting humans and GPUs

6. **KPIs** – quantifying the value, defining success metrics the capture value, accuracy metrics, AI-based metrics

7. **Risk Level** – weighing the risks of bias, ethics and stochasticity and the benefit of value creation in a SWOT

8. **Cultural Shift** – enabling adoption by creating a centre of excellence and culture of adoption

The above approach can be useful when considering implementing Foundational AI and assessing the value of its pre-configured solution. With Complexio's WCD approach, technology capabilities and minimal risk profile, FAI enables businesses to focus on establishing clear goals and problems to solve, quantifying future success and planning a whole company adoption strategy that allows for quick implementation and compounding value extraction to begin – rather than establishing the team, technologies and infrastructure required to build it in-house.

FAI Implementation: A Business Paradigm Shift

> "**As AI develops, there will be three types of people: those who create AI, those who use AI, and those who are used by AI**."
> Kazuhiro Nishiyama

By connecting WCD to the latest AI technology, Complexio significantly improves a businesses' ability to be productive. To minimise disruptions in the business, the following considerations must be made:

- **Focus on early implementation**: This will allow the business to get ahead of the competition and stay ahead of the curve.
- **Enable the Ingestion and Mapping of as much data as possible**: This will build an immediate ability to automate use cases.
- **Prepare existing infrastructure for FAI**: This will determine how the existing infrastructure will be configured to allow a central AI hub that enables collaborative decision making across the entire enterprise.
- **Align future goals with FAI**: This will unlock the compounding benefits of FAI, as it moves towards the ability to automatically automating all business activities.

While the initial implementation of FAI can appear daunting, the cost of not implementing in an AI-first world will be even more substantial.

Conclusion

It is evident that the integration of Foundational AI into business operations represents a significant leap forward in addressing the myriads of productivity challenges faced by enterprises. Existing setups, while beneficial, fall short in their ability to handle complex, recurring tasks, data-heavy processes, disparate systems and imperfect inputs. Foundational AI offers a transformative solution by providing a centralised, adaptable system that leverages whole company data to enhance decision-making, automate operations, and foster human-machine teaming.

The adoption of Complexio's Foundational AI framework is poised to revolutionise how businesses operate, enabling them to achieve higher productivity, better strategic alignment, and improved enterprise efficiency. As companies navigate the road to AI implementation, it is crucial to focus on a structured approach that includes setting clear goals, a strategy for using WCD, and fostering a culture of innovation and continuous improvement.

By embracing these Complexio's advanced AI solutions, enterprises can unlock new levels of efficiency and engagement, positioning themselves for sustained success in an increasingly competitive and technologically driven landscape. The future of business is one where AI not only supports but significantly enhances and even augments human capabilities, leading to a more productive and prosperous enterprise environment.

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