HEXAWARE

AI in Life Science

From traditional to generative

Research report

Introduction

Recent developments in generative AI ignited a lot of interest towards artificial intelligence, traditional and generative. The new capabilities of responding to language prompts and creating different kinds of content not only add new use cases but make the technology accessible to more users than ever, drastically lowering use barriers for non-tech professionals.

At the same time, application of AI in Life Science has never been straightforward due to privacy and regulation concerns, data availability and challenges in stakeholder buy-in. The risks connected to patients' well-being, healthcare professional trust and confidence, and impact on core product pipeline are always the top concerns in the industry. That is why in this overview we focus specifically on the application of AI, generative and traditional, in Life Science, its potential impact, prospectives and challenges.

This report covers 96 high-level AI use cases applicable in Life Science, grouped by topic and place in the value chain. There is often more than one single way to implement a use case, that is why we refrained from dividing them into generative and traditional. We also looked at the potential impact and feasibility of the topics, barriers and trends that are present for AI in the industry.

While for every organization implementation the impact of AI may look different, we hope that this overview will provide some inspiration and bring more clarity to how AI can transform Life Science.

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AI, and specifically generative AI, are hot topics. How can they be used for Life Science?

Recent developments

and their potential impact

Recent releases of generative AI models from Open AI, Meta, DeepMind, and many more triggered a discussion about AI impact on various industries.

Expected economic impact from Generative AI uses case is 2.6-4.4 trillion US dollars, estimated by McKinsey, mostly focused on topics of sales & marketing, IT operations and R&D.

Generative AI models demonstrated possibilities of models to generate content based on prompts, increasing the application space for AI and making it more accessible to a wider audience.

New capabilities include content generation, conversation and coordination capacity, increasing individual productivity without the need for special knowledge.

Releases sparked the interest towards established uses of AI, e.g., clustering, recommendations, forecasting.

Generative AI provides a value add towards existing models, simplifying customization and limiting the need for translation between people and model.

Questions to consider

What does generative AI have to offer in Life Science?

What AI use cases have the most potential in Life Science?

What are the main challenges in AI implementation?

How Hexaware can help?

AI open opportunities across the entire value chain.

AI use case groups mapped to the Life Science value chain:

Solutions for
core business functions

Solutions for
supporting functions

RESEARCH & DEVELOPMENT	MANUFACTURING & LOGISTICS	SALES & MARKETING	SUPPORTING FUNCTIONS
RESEARCH & DISCOVERY ACCELERATION	SUPPLIERS AND CONTRACTING	MARKETING OPTIMIZATION AND CONTENT CREATION	HR
CLINICAL TRIALS OPTIMIZATION	LOGISTICS OPTIMIZATION	SALES ENABLEMENT	FINANCE
PUBLICATIONS STREAMLINING	QUALITY CONTROL	PATIENT ENGAGEMENT, SERVICES AND SUPPORT	IT
REAL WORLD DATA ANALYSIS	MANUFACTURING OPTIMIZATION		LEGAL
	DEMAND FORECASTING		

Solutions for
customers

DIGITAL PRODUCTS
CORE OPERATIONS SUPPORT
OPERATIONS OPTIMIZATION
ADMINISTRATIVE SUPPORT
SOLUTION MAINTENANCE AND SUPPORT

We have identified 96 high-level use cases for AI in Life Science and grouped them in 20 topics across the value chain.

AI can support core business functions, from product development to sales and patient support. It can also boost supporting functions leaving the company for more space to focus on what matters. Lastly, companies can build AI solutions for their customers, helping them to boost growth and optimize value.

Research acceleration and insight generation are the main goals of AI application in research & development.

Research & development

In research and development, AI can significantly contribute to research acceleration.

While discovery and clinical trial orchestration may bring the most impact, the barriers of data sensitivity, need for customized models and high complexity can limit feasibility of the use-cases. Still, models relying on open data will have higher feasibility and can constitute pilot use-cases.

At the same time, generative AI models can often be applied without heavy modifications to scientific research analysis, protocol, documentation, reporting, and publication generation, as well as to real world data analysis.

RESEARCH & DISCOVERY ACCELERATION

- Scientific publication and competition analysis.
- Understanding disease mechanisms and disease modelling.
- Cohort and indications identifications, also for personalized medication.
- Preliminary molecule screening, drug discovery and structure prediction.
- Alternative to testing in living organisms and digital twins.
- Initial future demand forecasting.
- Planning and staffing optimization.
- Virtual collaborator

CLINICAL TRIALS OPTIMIZATION

- Protocol development and instructions prep, study design and set up.
- Site performance prediction and selection.
- Documentation and training creation.
- Randomization management and ensuring diversity.
- Managing study logistics.
- Patient recruitment and enrollment.
- Monitoring of trial results.
- Medical coding, clinical data entry, review and analysis assistance.
- Reporting.

PUBLICATIONS STREAMLINING

- Publication generation.
- Documentation generation for customized approval processes across regions.

REAL WORLD DATA ANALYSIS

- Analyzing patient and practitioner submitted data to identify and manage potential effects, including pharmacovigilance.
- Analyzing open data such as social media to identify and manage potential effects, including pharmacovigilance.

Operation optimization is often the goal of AI applications in manufacturing and logistics.

Manufacturing & logistics

Manufacturing & logistics use cases can be leveraged not only in Life science, but in other industries as well. This makes the area attractive for external vendors who provide customizable AI enabled solutions.

At the same time, cases like maintenance co-pilot, documentation, contract and report generation can be relatively easily realized in-house with generative AI.

SUPPLIERS AND CONTRACTING

- Procurement analytics, risk assessment, vendor analysis, and selection.
- Contract analysis and contract building.

QUALITY CONTROL

- Quality control for supplies.
- Intermediate and final product quality control.
- Quality report generation.

DEMAND FORECASTING

- Initial demand forecasting and respective impact on supply chain.

LOGISTICS OPTIMIZATION

- Inventory management.
- Fleet and root optimization for supply, manufacturing and distribution.
- Personalized medication production and distribution.

MANUFACTURING OPTIMIZATION

- Manufacturing process optimization.
- Predictive maintenance.
- Maintenance co-pilot.
- Documentation generation.

Sales & marketing can leverage customization and co-pilot opportunities provided by AI.

Sales & marketing

AI made its way to customer relationship management solutions, with leading players in this area offering churn prevention, next best action and other solutions.

Sales & marketing can be a convenient domain to start AI exploration internally, due to quick feedback opportunities. The challenge will be how to keep the pace of these developments with the compliance and legal teams.

Social listening, material creation, reporting and research as well as assisted support are among the easier to implement generative AI use cases in this area.

MARKETING OPTIMIZATION AND CONTENT CREATION

- Competition analysis.
- Customer profile creation, followed by next best action type of tasks*.
- Marketing campaign planning and optimization.
- SEO and social media optimization.
- Content generation and customization.
- Pricing, including segment and time-dependent pricing*.
- Launch coordination.
- Social listening.
- Key opinion leader identification.
- Compliance checks and materials creation co-pilot.

PATIENT ENGAGEMENT, SERVICES AND SUPPORT

- Personalized health advice for patients.
- Behavior adjustment support.
- Patient reporting/generating input for HCP.
- Patient compliance predictions and compliance nudging.
- Patient engagement through wearables.
- Call-center routing/optimization.
- Assisted support dialogues.
- Customer (including HCP) self-service.

SALES ENABLEMENT

- Lead identification and scoring.
- Field-force optimization*.
- Incentives spend optimization*.
- Churn prevention*.
- Sales assistance, e.g., scripts and conversation support.
- Payer and government research.
- Internal and external reporting.
- Virtual salesperson.

* Local regulation may limit applications of algorithms in particular aspects of the topic.

Like other industries, Life Science can benefit from streamlining supporting functions with AI.

Supporting functions

AI can significantly contribute to supporting functions effectiveness.

There is potential for vendor-provided solutions, but some questions can remain too sensitive to use in solutions that share their data outside the company domain.

Legal use cases can be especially interesting for streamlining, as they are connected to the core functions. Generative AI has a lot of potential here as those functions are heavily text-dependent and data is often internal and pre-structured.

HR

- Analytics-driven hiring.
- Interview and recruitment assessment material generation.
- Employee retention.
- Performance management support.
- Reporting and internal communications assistance.
- Training material generation.
- Job description and other document generation.

FINANCE

- Accounting support.
- Reporting.
- Conversation assistants (expert support).
- Analysis and forecasting.
- Fraud detection.
- Invoicing and invoice tracking.

IT

- System design.
- Product design.
- Maintenance.
- Self-service and support.
- Data cleaning and mistakes correction.
- Code optimization and writing.
- Testing.

LEGAL

- Legal document drafting.
- Document analysis: compliance and legal issues detection.
- Legal research.

Life Science can offer AI solutions to healthcare providers, payers, and other stakeholders.

Digital products

As companies master AI applications, it can also offer AI solutions to their customers.

Those solutions can offer support in core functions. They can help to improve key parameters like mortality, days till dispatch or workload. Solutions can also help with administrative and support functions, helping healthcare providers to focus on their core competences.

In addition, maintenance and support of provided solutions can also be done with the help of AI.

CORE OPERATIONS SUPPORT

- Diagnostics and treatment identification, decision support.
- Adherence and behavior support.
- Virtual HCPs.
- Solution/product customization.
- Research optimization.

ADMINISTRATIVE SUPPORT

- Administrative support, including medical coding.
- Content creation.
- Reporting.

OPERATIONS OPTIMIZATION

- Key parameter forecasting and optimization.
- Revenue sources analysis, support and enablement.
- Performance assessment and benchmarking.

SOLUTION MAINTENANCE AND SUPPORT

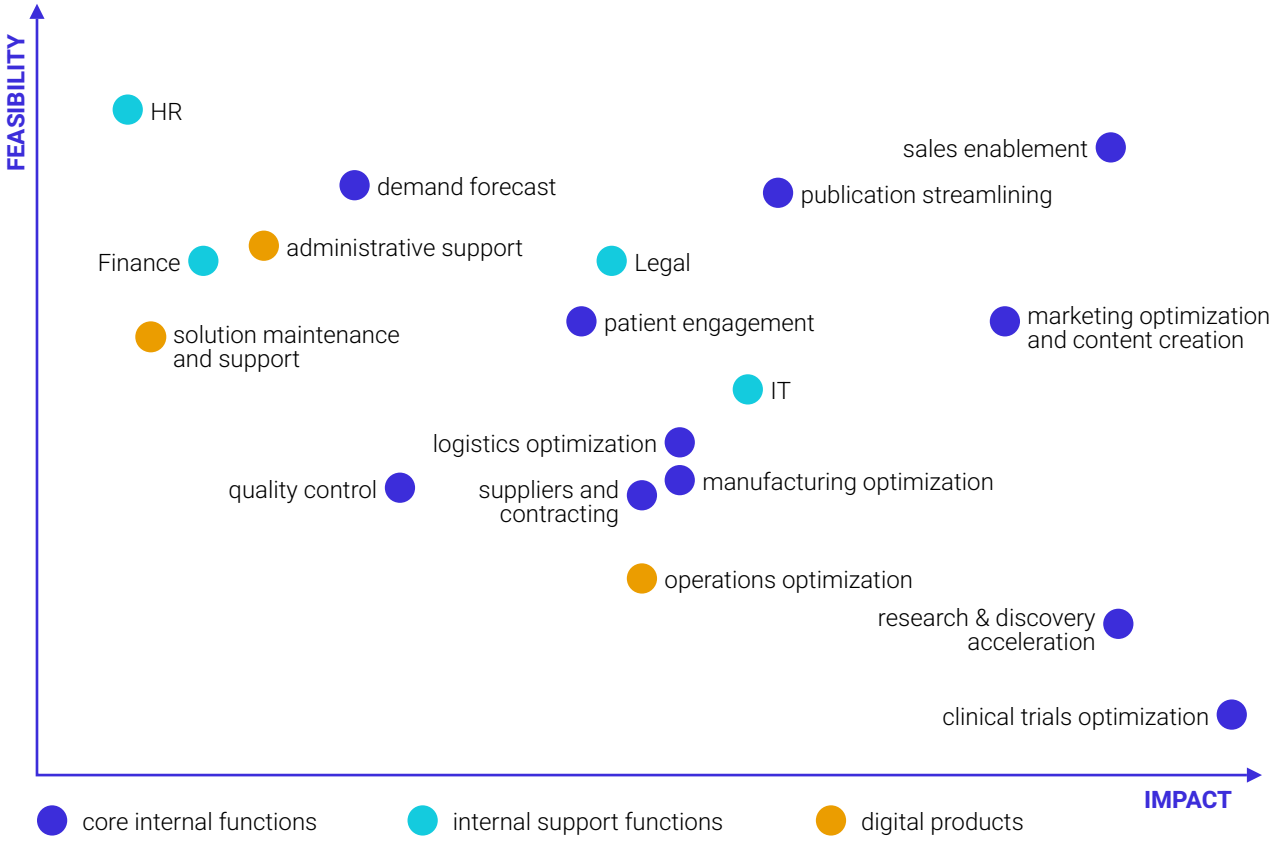
- Software maintenance.
- User support.

R&D, sales and marketing optimization use cases will drive the impact of AI in the next five years.

Impact of AI use cases will vary depending on the operations, maturity and value chain of the implementing company, as well as on market and client characteristics.

Furthermore, the impact of individual use cases might shift with time. For example, while the impact of patient engagement use cases might be limited currently, development of personalized medicine will increase their importance in the next decade.

Impact and feasibility distribution of AI use case groups for Life Science companies in the next five years:



IMPACT: indication of average potential cost savings or revenue growth effects from implementing the use-case group. Impact of individual use-cases varies.

FEASIBILITY: indication of data availability, model and regulatory complexity connected with the use case group. Individual use cases can have higher or lower relative feasibility.

Scale, complexity and autonomy of AI applications will further increase.

The way they are addressed in companies will change in terms of:

SCALE

From specialized pilot applications to holistically enabling operations within selected journeys and offering new AI-supported capabilities to customers.

COMPLEXITY

From isolated cases to solutions, addressing multiple business needs and supporting the company through the value chain.

AUTONOMY

From co-pilot format supporting professionals to autonomous operations with limited yet present oversight. Regulatory and reputational concerns will limit autonomy growth in Life Science compared to other industries.

PLURALISM

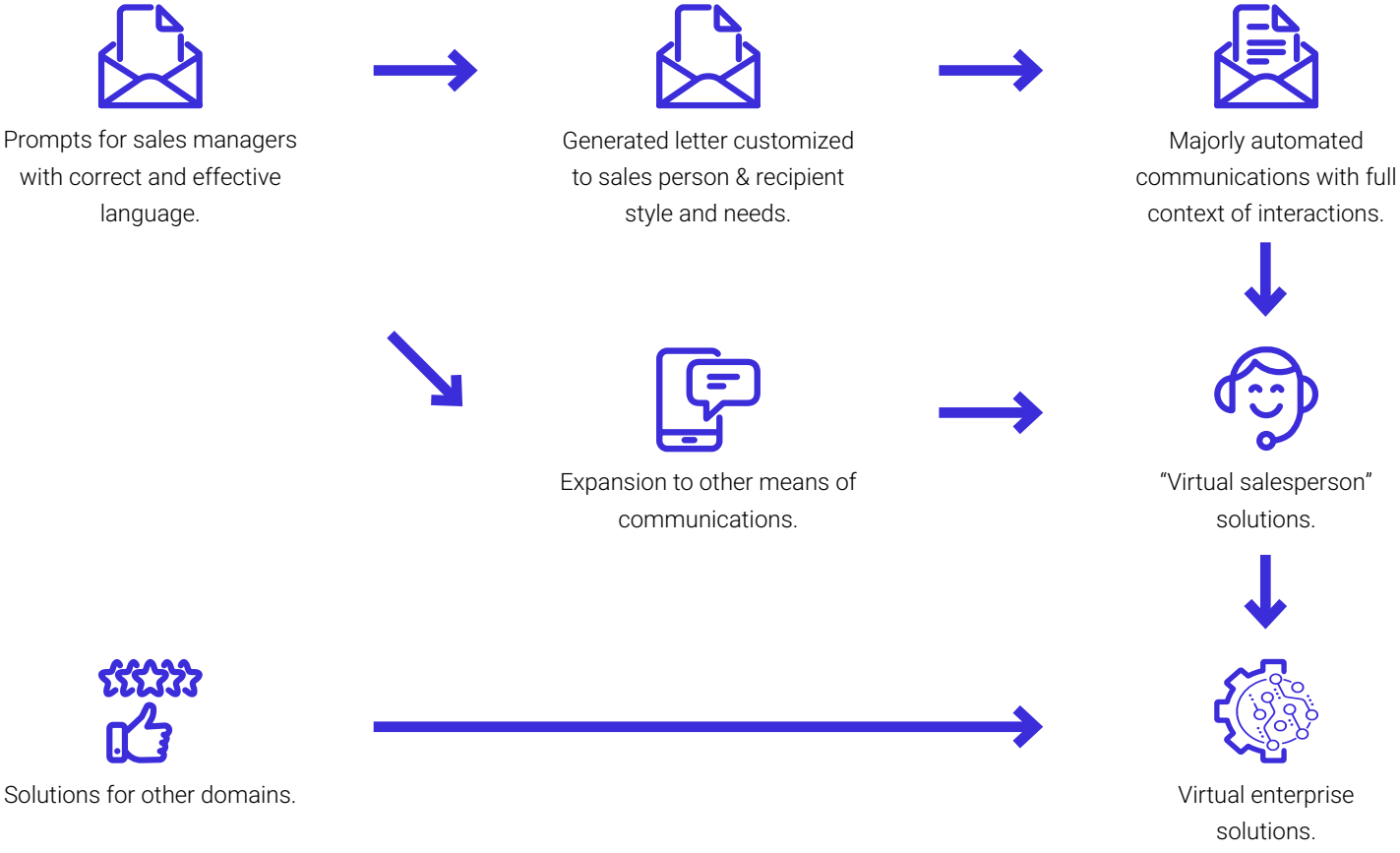
From limited choice or need for in-house development to variety of vendors offering easily customizable easy-to-implement alternatives.

EMERGING BEHAVIORS

Integration of AI into our daily work will raise new questions, cause new employee and customer behavior and trigger new use-cases. E.g., one of the use cases coming up is how to tell a model-generated content from person-generated content.

Individual use cases are going to evolve through time:

SALES LETTER EXAMPLE



Models might be already available but organizations still need to provide right data and establish quality controls.

Key stages for AI use case implementation:

1 INITIATION

Identifying the problem the company wants to address, defining objectives, key stakeholders, initial architecture and requirements.

2 DATA & PLATFORM PREPARATION

Setting up data architecture, collecting, cleaning and pre-processing data, addressing possible bias. Analyzing data for future and current decision making.

3 MODEL TRAINING AND/ OR TUNING

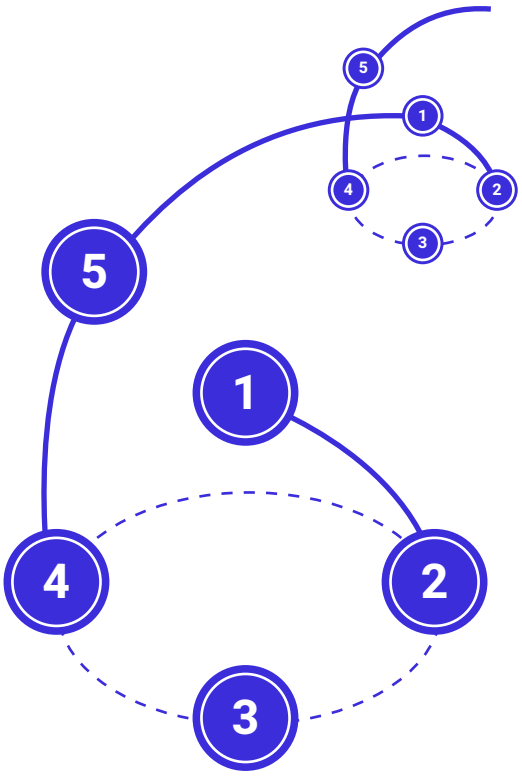
Building, adjusting and/ or training the selected model. Checking performance and optimizing it. Can focus on prompt engineering in case of generative model use.

4 MODEL TESTING & CONTROLS IMPLEMEN-TATION

Testing the model and implementing output controls. This step is crucial for Life Science to ensure proper quality control on model output, given risks.

5 DEPLOYMENT

Deploying the model, maintaining and refining the model. Also includes any activities to change processes connected with the solution.



Barriers for AI adoption in Life Science are significant but can be mitigated.

Main barriers

DATA AVAILABILITY	Life Science often works with highly-sensitive, specialized, fragmented and inconsistent data. Ensuring data sufficiency and quality, especially for projects relying on external data, is a challenge.
REGULATION & PRIVACY	Life Science is a heavily regulated industry, especially when it comes to operations facing patients and HCPs. Approval processes, privacy questions along with necessary studies can significantly slow down adoption. Local regulation differences will lead to different adoption pace of adoption, with USA probably being in the general forefront.
STAKEHOLDER BUY-IN	Introducing new practices is never easy, especially in such a complex environment as Life Science. With reputation being a crucial asset, stakeholders will be demanding quality and clarity from solutions.
NEED FOR TALENT	Setting up AI requires skills that are in high demand at the moment. Life Science specificity may make the search for the right talent even trickier.

Mitigation strategies

It is important to start experimenting with AI now to understand how it can serve the business. Implementing smaller cases in selected 2-3 domains helps to build better understanding of AI value and challenges.

Piloting operations optimization use cases with internal data or readily available models often provides the best starting point for companies and AI. This also helps to limit regulatory and reputation exposure in the beginning.

Data strategy and practices are foundational for AI. Investment in them ensures quality and reasonable timelines for AI solutions in development.

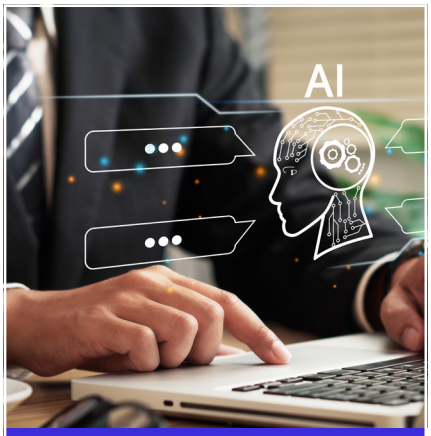
The current landscape already warrants ‘make, partner or buy’ analysis before engaging in a project, offering options to manage risks and source external talent.

Leveraging AI to its full potential requires changes throughout the organization, not only in IT or digital. Legal, operations, sales and HR readiness can significantly contribute to the success or failure of AI programs.

Hexaware supports organizations in AI journeys from outlining AI strategy to bringing new ideas to meaningful and operational solutions.

AI STRATEGY

- We partner with our clients to create or reimagine AI strategies for organizations, domains and customer journeys.
- We identify the best place to start, ensure that AI serves the goals of organization and build the momentum to go beyond pilots to consistent research and implementation.

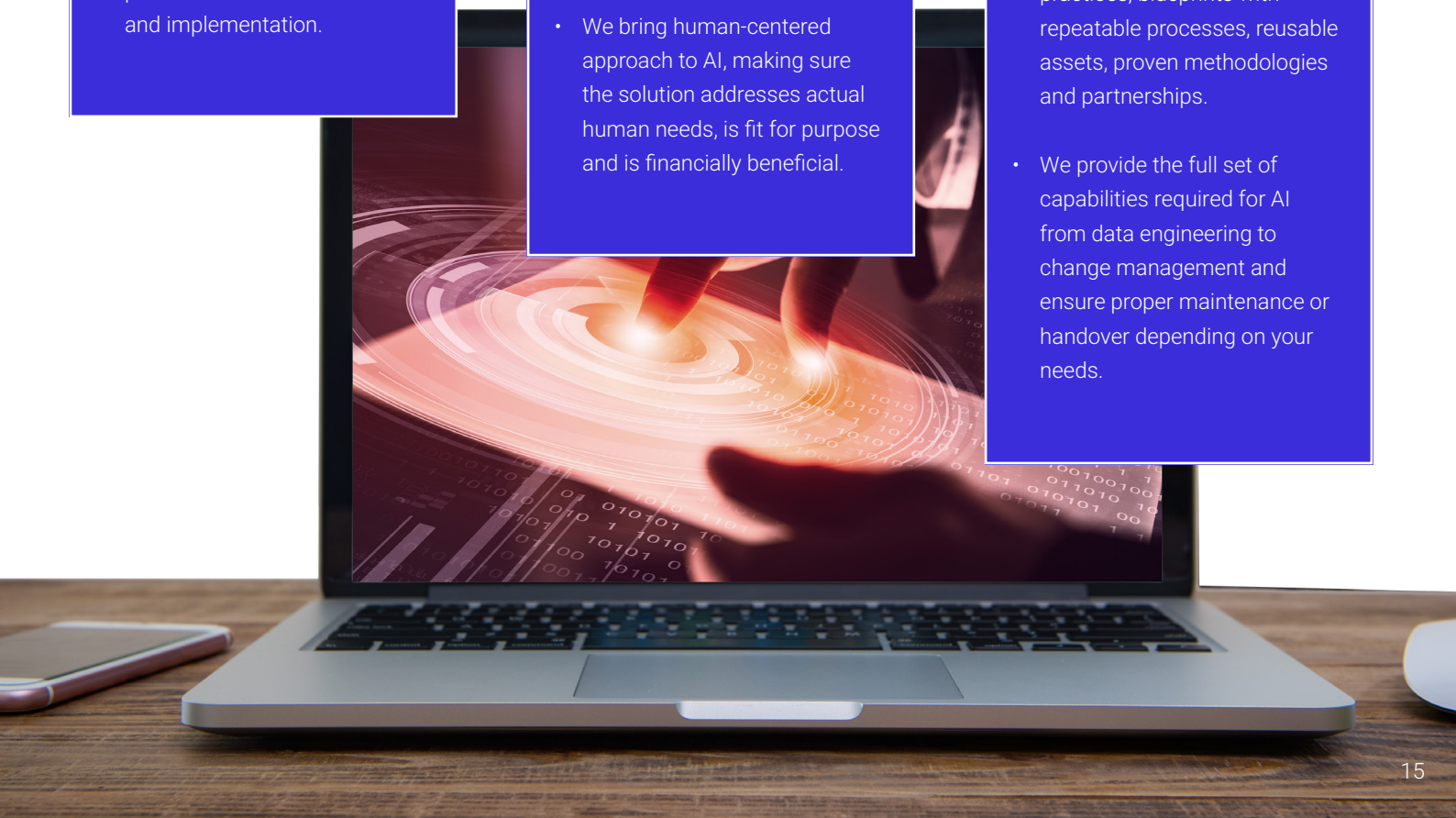


AI TOOLS, PROCESSES & TALENTS

- We define a fitting approach, methods and tooling that serve your business goals, current and desired maturity level for your AI strategy or a particular use-case.
- We bring human-centered approach to AI, making sure the solution addresses actual human needs, is fit for purpose and is financially beneficial.

AI SPEED & SCALABILITY

- We build solutions based on a solid foundation of best practices, blueprints with repeatable processes, reusable assets, proven methodologies and partnerships.
- We provide the full set of capabilities required for AI from data engineering to change management and ensure proper maintenance or handover depending on your needs.



A sampling of AI use cases Hexaware can define, build, and implement for you.

Solutions for core business functions

RESEARCH & DEVELOPMENT

- Scientific publication and competition analysis.
- Planning and staffing optimization.
- Documentation and training creation, including regulatory approval, publication generation.
- Analyzing patient and practitioner submitted data, open data to identify and manage potential effects.

MANUFACTURING & LOGISTICS

- Contract analysis and contract building.
- Manufacturing process optimization.
- Predictive maintenance.
- Maintenance co-pilot.
- Documentation generation.

SALES & MARKETING

- Content generation.
- Social listening, payer and government research.
- Sales assistance, e.g., scripts and conversation support.
- Internal, external reporting.
- Personalized health advice, behavior adjustment support.
- Call-center routing/optimization and assisted support dialogues.

Solutions for supporting functions

HR

- Job description, interview assessment and training materials generation.
- Performance management.
- Reporting.

FINANCE

- Accounting support.
- Reporting, analysis and forecasting.
- Fraud detection.
- Invoicing and tracking.

IT

- System and product design.
- Maintenance.
- Self-service and support.
- Data cleaning/ correction.
- Code optimization, writing and testing.

LEGAL

- Legal documents drafting.
- Document analysis: compliance and legal issues detection.
- Legal research.

Solutions for customers

DIGITAL PRODUCTS

- Adherence and behavior support.
- Solution/product customization.
- Key parameter forecasting and optimization.
- Revenue sources analysis, and enablement.
- Performance assessment.
- Administrative support, including medical coding.
- Content creation.
- Reporting.
- Software maintenance.
- User support.

LOOKING FOR A PLACE TO START?

DECODE AI

Generative AI Ignition Workshop

We look forward to helping you gain practical insights and strategies to decode the complexities, and harness the true potential of generative AI, driving real value for your business.

DECODE AI

1. RESEARCH CHALLENGES

Preceding the workshop our team will conduct market research and a couple of short interviews with your business stakeholders to get a good understanding of its challenges and the target audience.

2. EMPATHIZE & DEFINE

- Introduction to Gen AI and showcasing technological possibilities.
- Inspiring examples of valuable use cases and scenarios.
- Break down challenge, create journeys and define needs, frictions and hypotheses.

3. IDEATE & PRIORITIZE

- Ideate solutions based on our Gen AI value proposition canvas.
- Prioritize based on human desirability, technical feasibility and business viability.

4. REPORT OUT

After the workshop, our team creates a report out with:

- Portfolio of opportunities.
- Riskiest assumptions for validation.
- Execution plan with team, timeline and investment.

Join the workshop

HEXAWARE

Hexaware is a global technology and business process services company. Our 27,000 Hexawarians wake up every day with a singular purpose; to create smiles through great people and technology. With this purpose gaining momentum, we are well on our way to realizing our vision of being the most loved digital transformation partner in the world. We also seek to protect the planet and build a better tomorrow for our customers, employees, partners, investors, and the communities in which we operate.

With 40+ offices in 19 countries, we empower enterprises worldwide to realize digital transformation at scale and speed by partnering with them to build, transform, run, and optimize their technology and business processes.

Learn more about Hexaware at **https://www.hexaware.com**

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