

Generative AI in the factory of the future

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“Any sufficiently advanced technology is indistinguishable from magic”

Arthur C. Clarke

Gen AI is proving to be a game-changer

Productivity gains are real and proven

55%

faster completion of coding tasks with higher success rates using **GitHub CoPilot**¹

37%

faster completion of knowledge work with comparable quality results using **OpenAI ChatGPT**²

1. <https://github.blog/2022-09-07-research-quantifying-github-copilots-impact-on-developer-productivity-and-happiness/>
2. <https://joshbersin.com/2023/03/new-mit-research-shows-spectacular-increase-in-white-collar-productivity-from-chatgpt>
3. Reuters, Yahoo! Finance, OpenAI
4. Crunchbase, Pitchbook, BCG Analysis

Barriers to AI are lower than ever

Conversational UX eases human adoption

Same model can handle **multiple downstream** tasks

Robust against unstructured, unlabeled messy data

2 months

to 100M users for **OpenAI ChatGPT**, the fastest product on record³

Widely expected to create outsized value

~\$120B

expected global market size for Gen AI by 2030






~\$20B+

of committed VC funding for Gen AI in the last three years alone⁴






And even the most tech-skeptical executives recognize AI to be one of most disruptive technologies

Technologies that could positively disrupt manufacturing industry, ranked by industry executives

Executives with lower affinity for digital & tech

- 1  Artificial intelligence (incl. GEN AI)
- 2  Industry 4.0 and cyber-physical systems
- 3  Additive manufacturing
- 4  Industrial metaverse
- 5  Virtual and augmented reality

Executives with higher affinity for digital & tech

- 1  Artificial intelligence (incl. GEN AI)
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Yet, organizations are not yet prepared to bet on it

37%

of companies have
no clear digital
governance model

80%

of tech spend is not
invested in
innovation

52%

of companies are
discouraging Gen AI
use

While traditional, predictive AI is still a game, gen AI adds another dimension to it

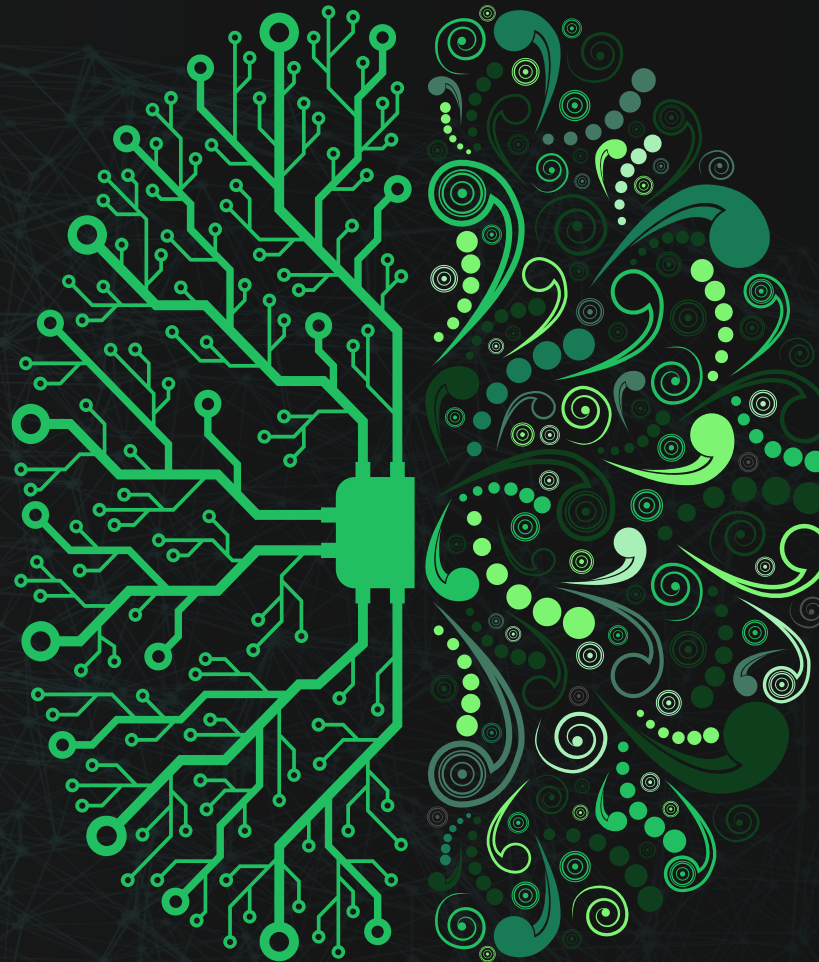
Predictive AI

Analytical

Categorization and analysis of data, calculation of probabilities

Decision support

Supplementing leadership skills



Generative AI

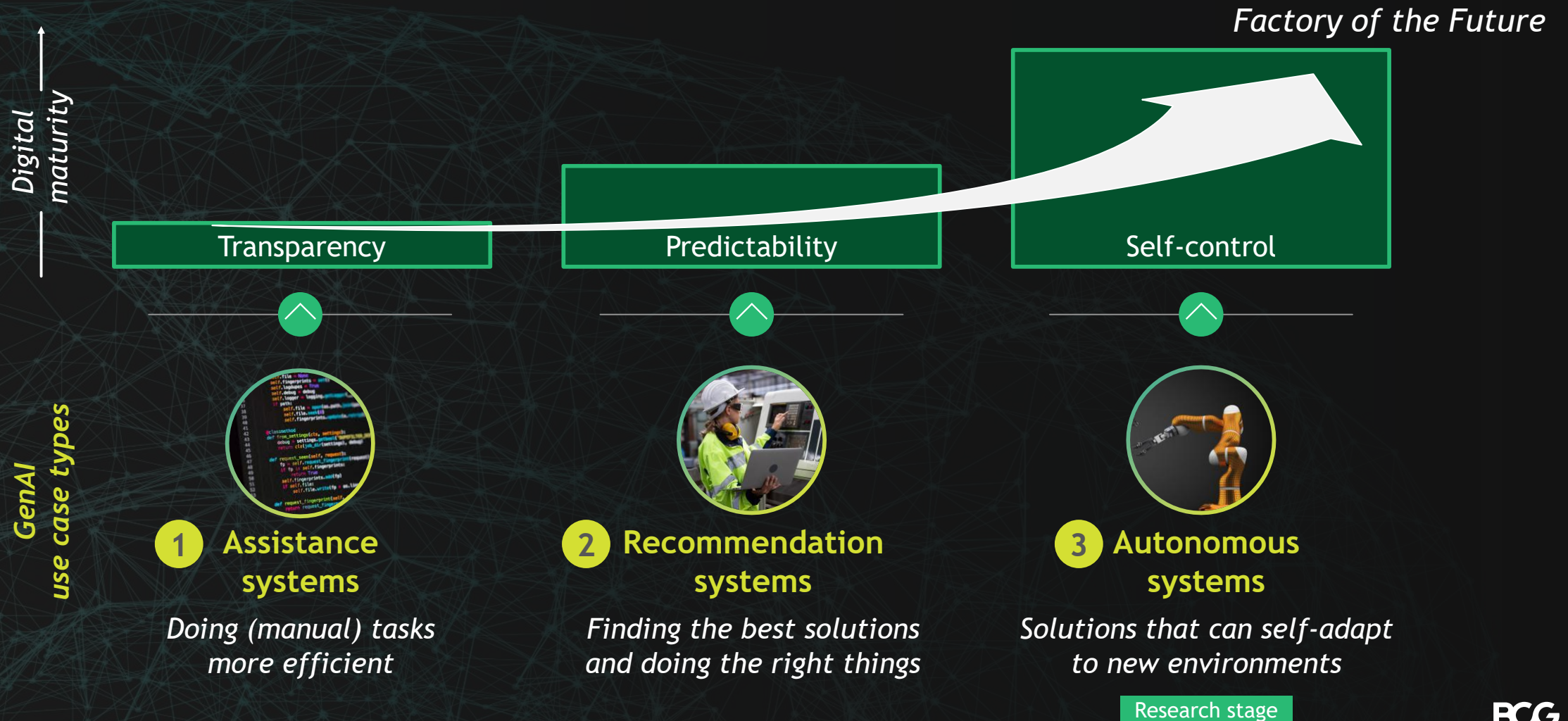
Creative

Interpretation and synthesis of data, generation of original content

Problem solving

Expanding employees' skills

To begin harnessing the Gen AI power, factory must recognize where in digital maturity scale they are



GenAI use cases in the Factory of the Future

Non-exhaustive

Use cases

1 Assistance systems

Doing (manual) tasks more efficient



Machine & PLC programming



Standard Operating Procedures



Maintenance instructions



Digital twin generation from 2D drawings

...

2 Recommendation systems

Finding the best solutions and doing the right things



Root cause suggestions



Repair recommendations



Quality/yield improvement:
Suggestion of critical components¹



Factory sketching



Design-for-Manufacturing

...

3 Autonomous systems

Solutions that can self-adapt to new environments



Synthetic training data generation



Synthetic training data deployment to new environments



Robotics transformer²

...

Research stage

1. To focus on, e.g., where/on which component to run a setpoint optimization via Machine Learning
2. Autonomous deployment of robots in different environments

Companies across industry are already trialing Gen AI solutions in quick win use cases to drive transformation

fullpath

Leveraging Gen AI to assist shopper in their searches and dealers in managing their customers



500+

North American Dealership on waitlist



Question Answering

SIEMENS

Using Gen AI to augment the creation, optimization and debugging of code in factory automation

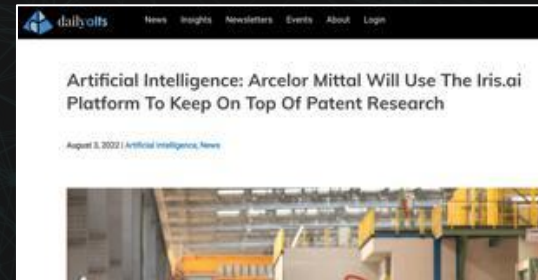


100%

Impact across product development lifecycle

ArcelorMittal

Automated patent research & synthesis by ingesting and summarizing published papers



94%

Precision of Extraction



Content Generation

3M

Natural language queries to rapidly find information and accelerate R&D



1200+

Enabled new products

Focused, iterative introduction based on situation assessment is recommended for optimal impact



Brainstorming and evaluation

Involvement of experts, assessment of ambitions and needs, identification of relevant use cases



Defining strategy

Assessment of capabilities, definition of AI objectives, development of selected use cases, establishment of impact measurement GenAI Lab



Agile implementation

Brainstorming and prototype development, testing, scaling and full introduction, process transformation, supervised AI operation

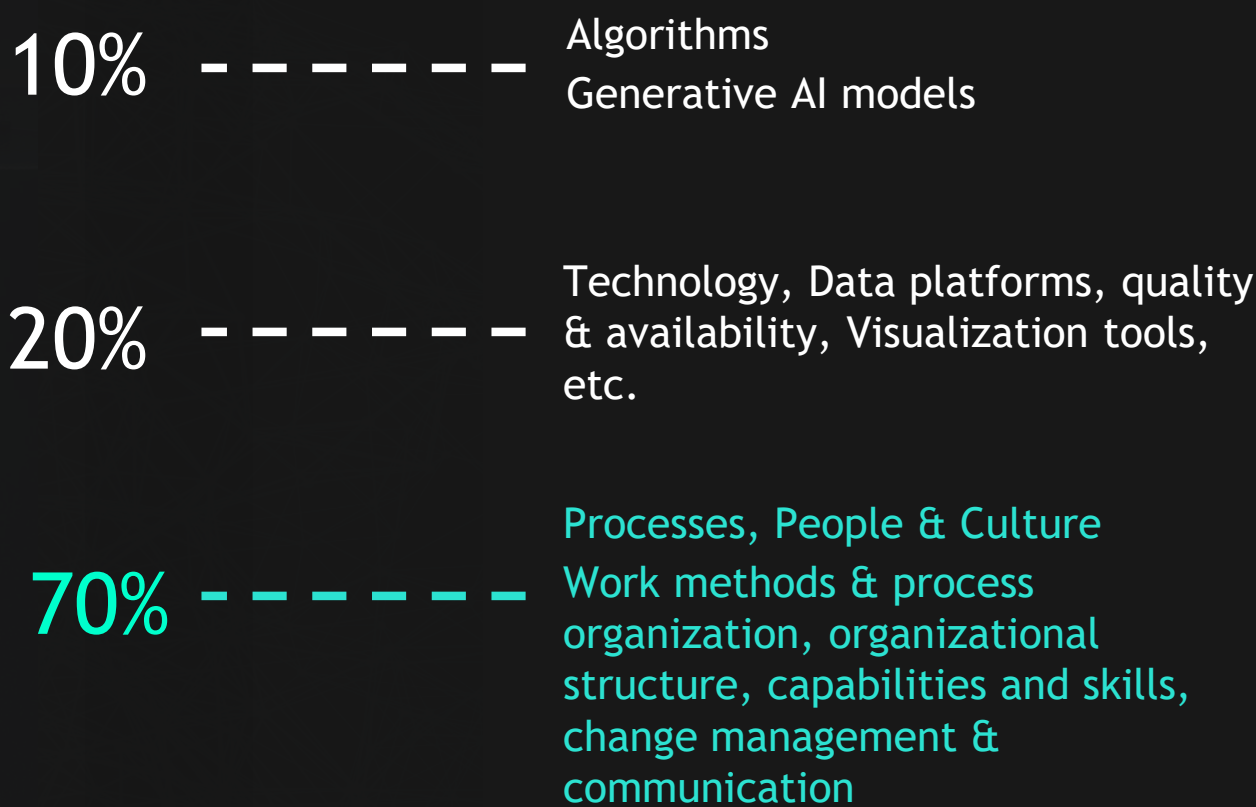


Building foundations

Creating business data assets, 'Responsible AI', supportive IT architecture and solutions, building organizational capabilities

High-value use cases should finance the entire transformation

But the main task for organizations will remain: Aligning technology and organization to fully harness the potential



Source: BCG analysis and project experience



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