

Convegno Nazionale IPMA Italy

AI in the future of Project Management



Progettare il Futuro: Esplorando le Frontiere della Gestione Progettuale con l'AI Generativa

Milano | 14 marzo 2024

a cura di:

Marco Siciliano, Andrea Dentone

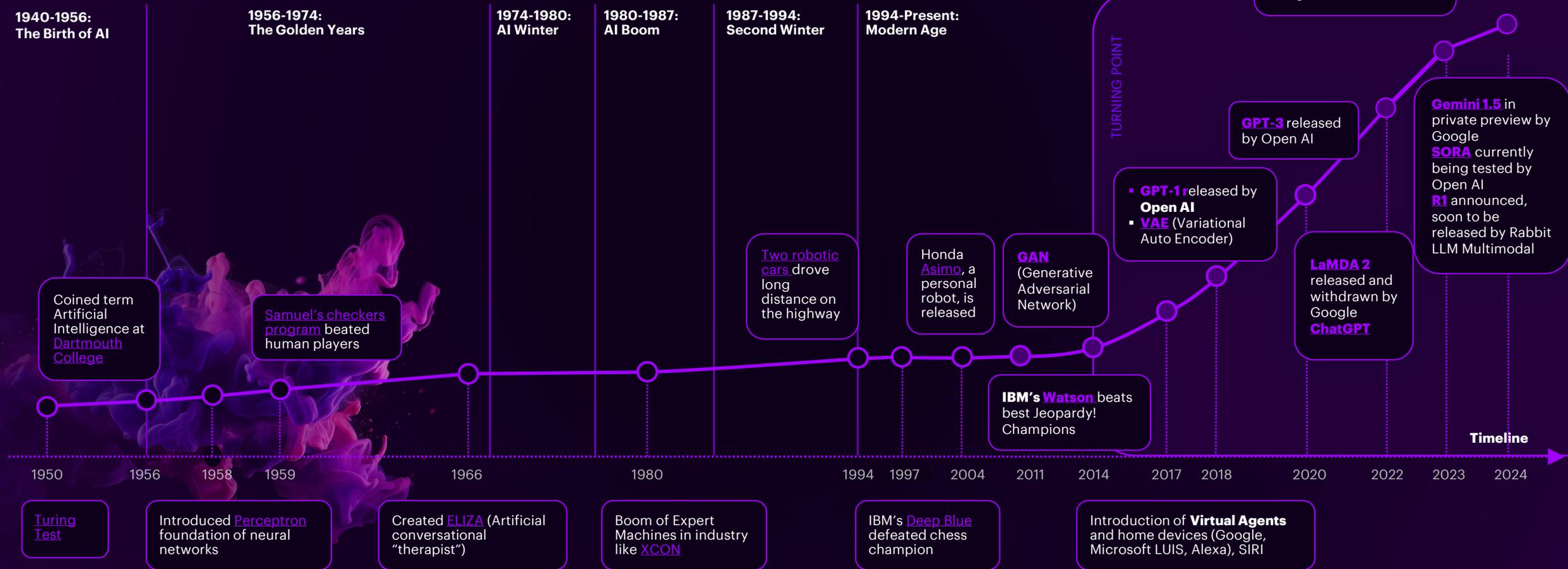
Data & AI Managing Director e ICEG IX

Infrastructure & Capital Projects Lead

Accenture

The long history of AI is reaching a new golden age

“AI is the broad term used to describe the set of technologies that enable machines to sense, comprehend, act and learn.”



Artificial Intelligence Cognitive Domains



Advanced Analytics

- Predictive & Prescriptive Model
- Forecasting model also based on Time Series
- Predictive Maintenance
- Early Warning Definition
- Warranty/ Parts Lifecycle Analytics

Generative AI



Computer Vision

- Advanced OCR/ICR
- Video Analytics
- Digital Signage & Authentication



Natural Language Processing

- Virtual Assistant
- Chatbot
- Expert System
- Text Analysis

AI

Generative AI has a strong impact on all Cognitive Dimensions

Generative AI allows machines to create new content based on the data it has been trained on

Generative AI



Language

Language generation

- Virtual agents & search engines
- Documents Generation & Summarization
- Virtual voices & identities



Vision

Image generation

- Images & Video Generation
- 3D environments and digital twin
- Quality enhancement



Reasoning

Synthetic Data

- Synthetic Data
- Data & Signal enhancement
- Code Generation & Migration

* Not Exhaustive

The momentum for Generative AI (GAI) is strong



10+ B\$

Microsoft invested in **Open AI** in 2023 (plus at least 3 Billion in 2022)

>450

start-ups are now working on **Generative A.I.**

4 B\$

Just invested by Amazon in Anthropic (2023, September)

10%

of all **data** could be **A.I. generated by 2025** – Satya Nadella, CEO of Microsoft

Generative AI Tech Landscape Overview*

* As of January 2024, Not exhaustive

-  Hyper-Scalers
-  Proprietary PaaS Strategy

OpenAI Public

OpenAI Services available on public cloud provided by OpenAI, under subscription or not (e.g. <https://chat.openai.com/>)

Not regulated for Corporate
US localized

NOT APPLICABLE FOR A CORPORATE



OpenAI Private

OpenAI Services available on the private cloud provided by OpenAI, under subscription.

Regulated under OpenAI T&C
US localized

HARD TO APPLY FOR A CORPORATE

OpenAI @ Azure

OpenAI and MSFT Services in general availability on Microsoft Azure private cloud subscription.

Regulated under MSFT std T&C
EU localized

APPLICABLE TO A CORPORATE



Google GenAI

Google Generative AI services (Lamda/Bard/Vertex AI) provided on Google Cloud Platform (GCP) private subscription, currently in preview (not available in EU).

Regulated under GCP std T&C
EU localized

APPLICABLE TO A CORPORATE



AWS GenAI

3rd Parties (e.g. Anthropic by Claude, Jurassic 2 by AI21, Stable Diffusion), Amazon Foundation Models (Titan) and Open-Source (Huggingface models, LLaMA, ...) operated on Bedrock (private preview in US) and SageMaker Jumpstart (available).

Regulated under AWS std T&C
EU localized

APPLICABLE TO A CORPORATE



On Prem

3rd Parties and Open-Source foundational models, suitable for being operated on a proprietary infrastructure.

Owned, localized and regulated by the Corporate

APPLICABLE TO A CORPORATE



On Edge

Third Parties and Open-Source foundational models, suitable for being operated on a On-Edge devices network.

Owned, localized and regulated by the Corporate

APPLICABLE TO A CORPORATE



Several LLMs in the Arena are available ...

HyperScalers, Platforms,
Semiconductors
Outsiders, StartUp,
ScaleUp
Academic / Research
Institutes

Proprietary	MSFT / OpenAI	Google	Meta	ALIBABA	NVIDIA	DATAB RICKS	Hugging Face	Mistr al	Perplexity	Stability AI	Anthropic	01 AI	Academic / Research Institutes
	GPT-4-Turbo	Bard (Gemini Pro)		Owen-14B-Chat					Pplx-70b-online		Claude-1		
	GPT-4-0314	Gemini Pro (Dev API)						Mistral Medium			Claude-2.0		
	GPT-4-0613	Gemini Pro									Claude-2.1		
	GPT-3.5-Turbo-0613	PaLM-Chat-Bison-001									Claude-Instant-1		
	GPT-3.5-Turbo-0314												
	GPT-3.5-Turbo-1106												
Open Source	Apache 2.0							Mixtral-8x7B Instruct-v0.1					
	LLaMa 2 Community	WizardLM-70B-v1.0	Llama-2-70B-chat CodeLlama-34B-Instruct		NV-Llama-2-70B-SteerLM-chat			Mistral-7B-Instruct-v0.1					
	CC-BY-NC-4.0, MIT & Other	WizardLM-13B-v1.2	Llama-2-7b-chat LLaMA-13B										
						Dolly-V2-12B	Zephyr-7b-alpha			StableLM-Tuned-Alpha-7B		Yi-34B-Chat	SOLAR-10.7B-Instruct-v1.0 <small>Upstage AI</small> Starling-LM-7B-alpha <small>UC Berkeley</small> Falcon-180b-chat <small>TII</small> Koala-13B <small>UC Berkeley</small> Alpaca-13B <small>Stanford</small> MPT-30B-chat <small>MosaicML</small>

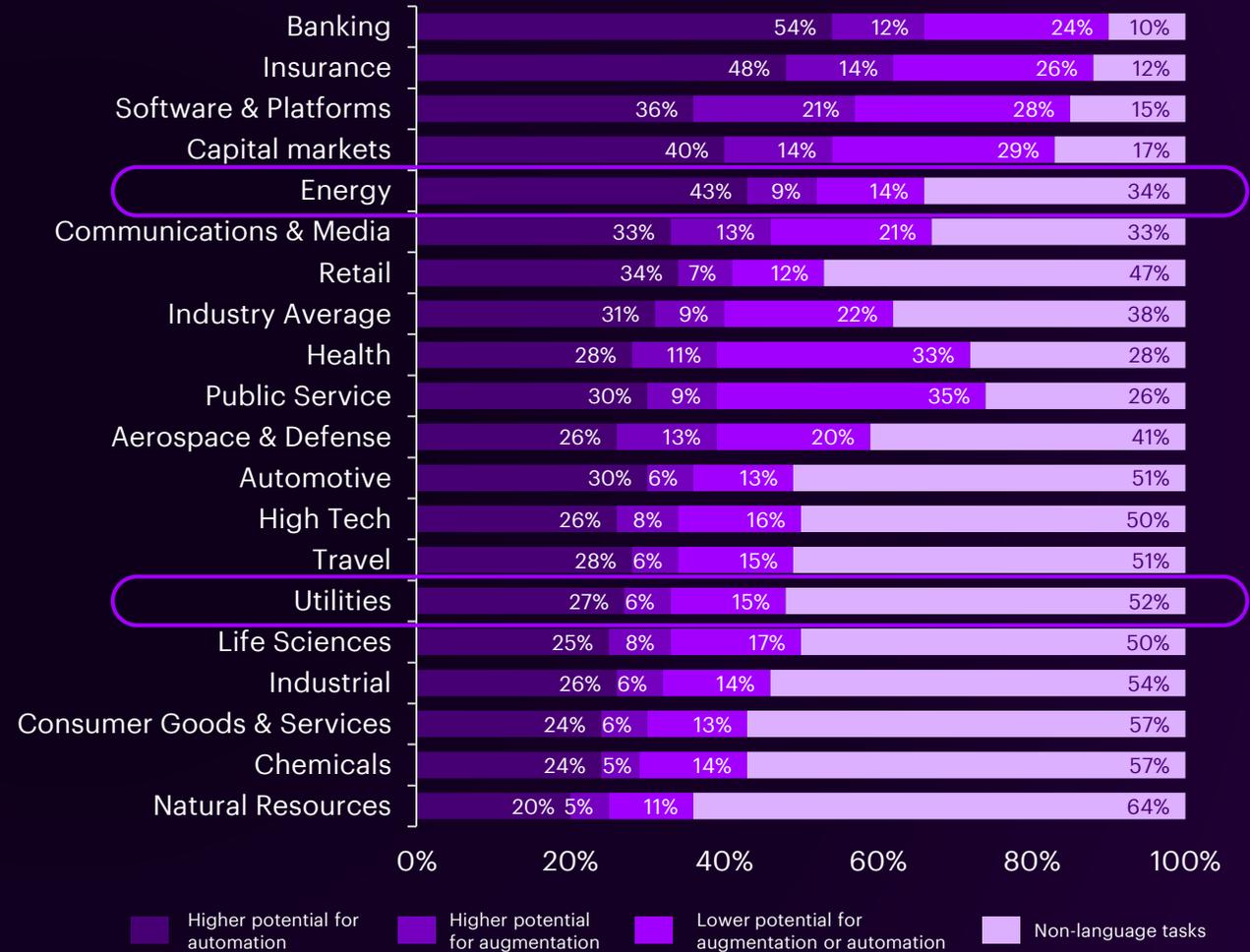
Generative AI will transform work across industries...

4 in 10

want to make a large investment in Generative A.I.

40%

of all working hours can be impacted by LLMs like GPT-4



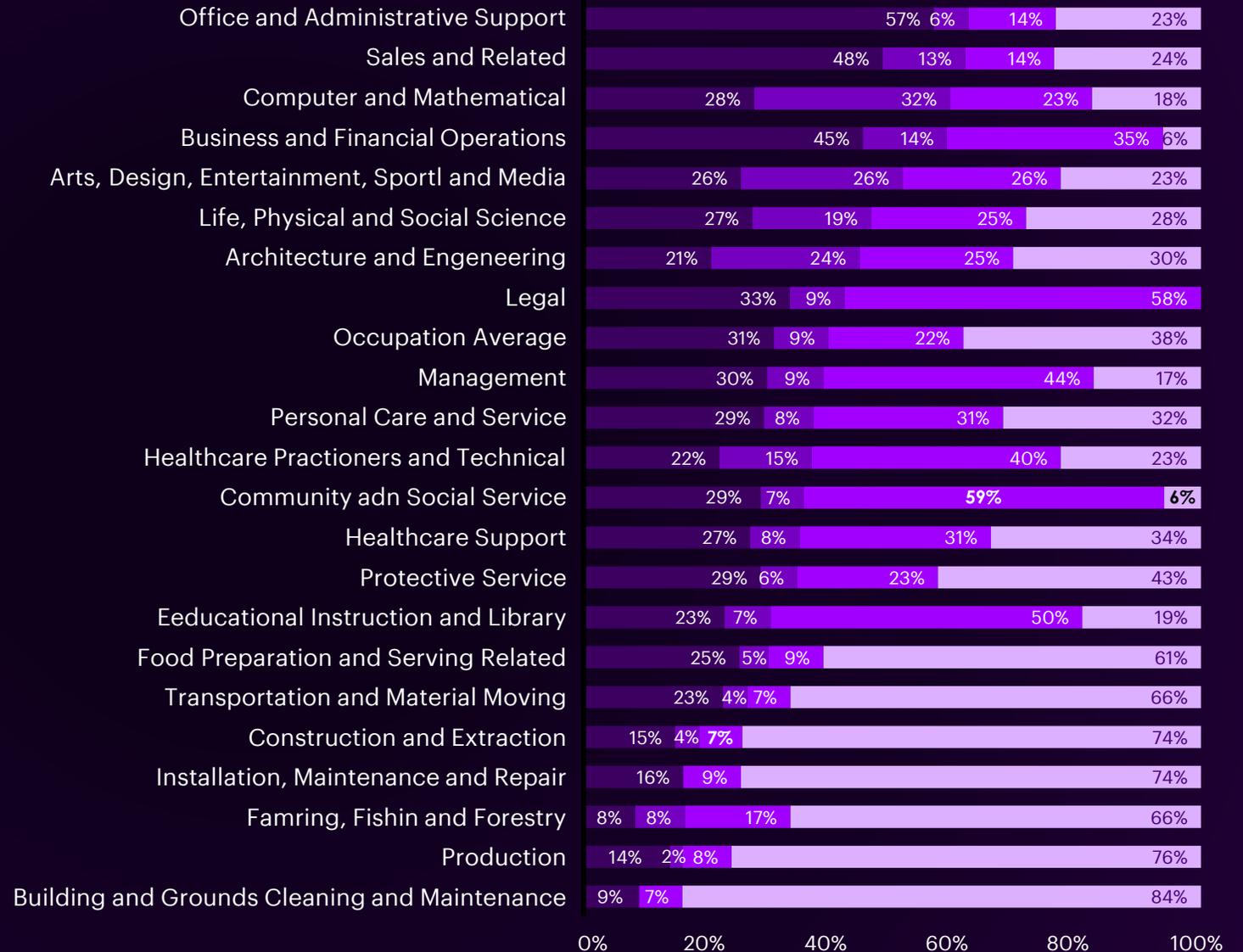
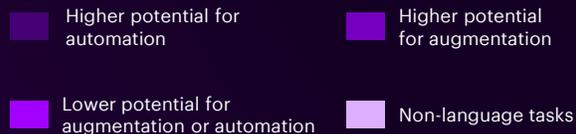
Source: Accenture Research based on analysis of Occupational Information Network (O*NET), US Dept. of Labor; US Bureau of Labor Statistics.

Notes: We manually identified 200 tasks related to language (out of 332 included in BLS), which were linked to industries using their share in each occupation and the occupations' employment level in each industry. Tasks with higher potential for automation can be transformed by LLMs with reduced involvement from a human worker. Tasks with higher potential for augmentation are those in which LLMs would need more involvement from human workers.

...and will have a significant impact on many jobs...

Administrative and Commercial

are the jobs with the greatest potential for automation...if we all adopt a **new PROMPT MINDSET**



Generative AI is moving fast forward improving the Acting scenario

SENSE



Acquire and process data images, sounds, speech, ...

COMPREHEND



Analyze information, **understand** and provide insights

ACT



Take action based on what has been comprehended

LEARN



Try, fail and **continuously improve**

AI & Data Understanding

GenAI and Data Generation

Speech Recognition, Vision services and IoT Sensors

Data understanding (NLU, image processing, data patterns analysis)

Workflow Orchestration and RPA

Supervised, Unsupervised and Reinforced Learning

Data signal quality augmentation & Data generation

Foundational Model
(Large Language Model, Large Vision Model, Multimodality)

LangChain

RLHF & Prompt Engineering

Self-supervision
Chain of Thought
Zero Shot Chain

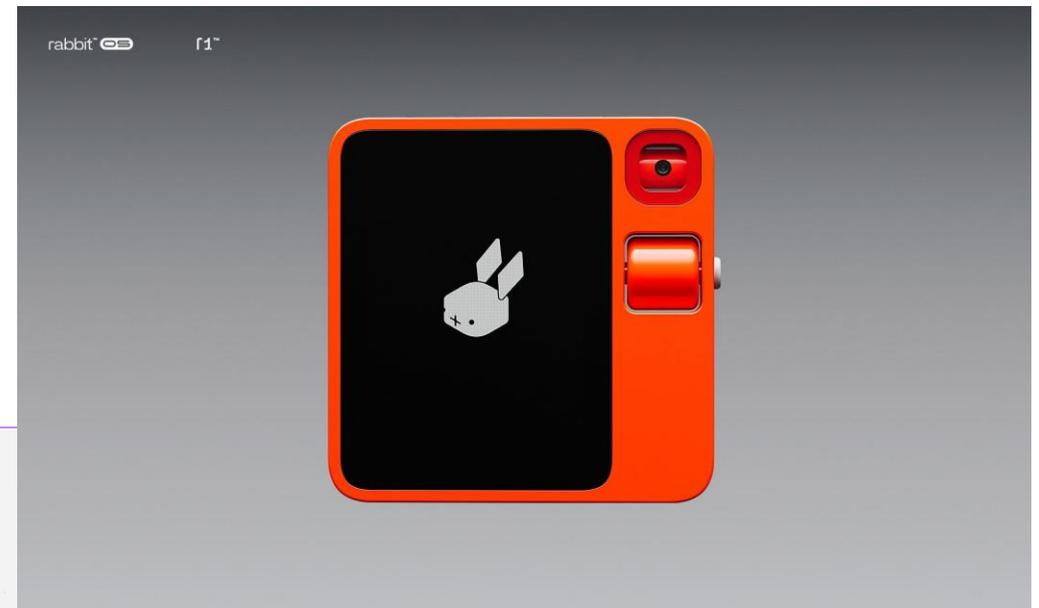
Large Action Model

From LLM to LAM

Rabbit R1 has been presented in Las Vegas during last CES 24

It embeds Perplexity.ai - as LLM application - and **Rabbit OS, a proprietary LAM**, thus being able to address web surfing on multiple platforms (not all, yet) based on prompt instructions.

Rabbit R1 has the ambition to fully decouple underlying and 3rd parties' applications, playing as **single and unique interface** towards to final users and providing **full-prompt-experience**.



https://www.youtube.com/watch?app=desktop&v=22wLLy7hKP4&ab_channel=rabbit

Gen AI in Capital Projects



Understanding the Rationale for Gen AI in Capital Projects

Capital Projects regularly run over budget, over schedule, and under benefits – so much so that 9 out of 10 projects experience cost overruns – regularly up to 50%, and not uncommonly over 50%!

1 WHY is Gen AI needed?

93%

of survey respondents ranked project performance data (e.g., cost & schedule) as high or very high importance²

47%

of project performance data is collected in paper forms or spreadsheets²

11%

of every investment dollar is wasted due to poor project performance³

2 WHAT can Gen AI do?

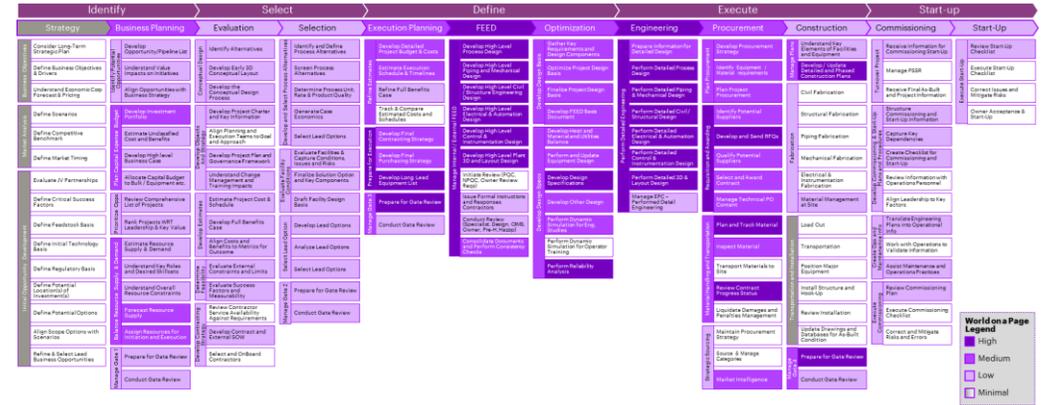
Advise: Permanent, always-on advisor for knowledge work, boosting productivity by putting intelligence into human hands.

Create: Essential creative partner, offering new ways to reach and appeal to audiences and bring unprecedented speed and innovation.

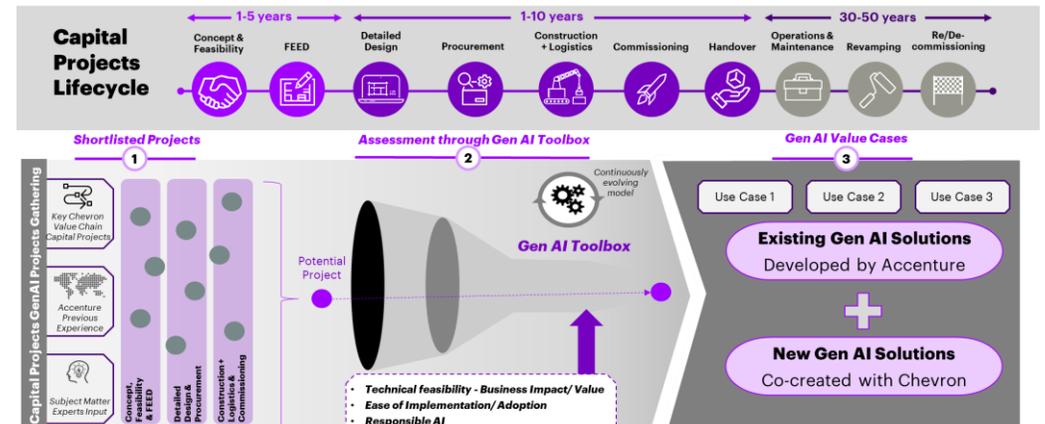
Protect: Assistant for governance & information security against fraud, strengthening regulatory compliances & proactively identifying risk.

Automate: Co-pilot that significantly automates business processes & functions driving efficiency, productivity and process enhancements.

3 WHERE will Gen AI impact?

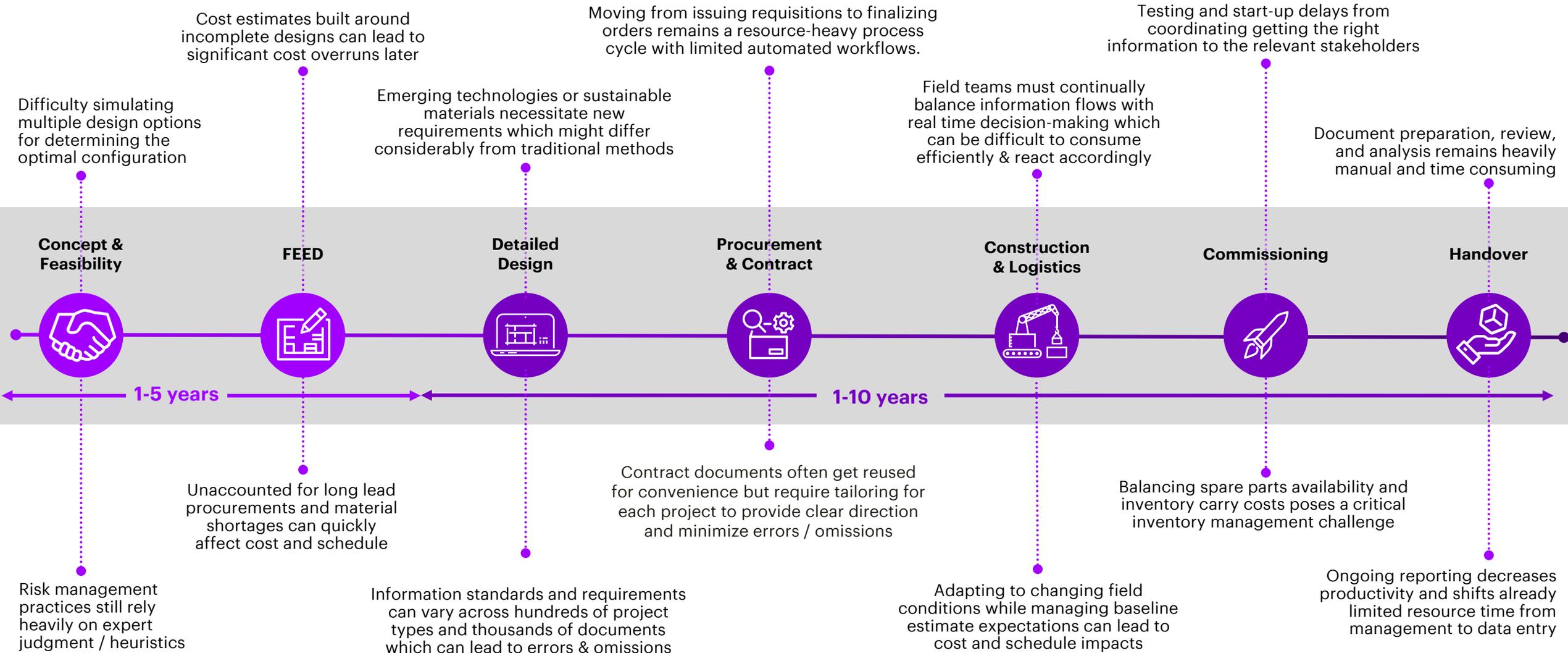


4 HOW can we experiment with Gen AI?



Understanding the WHY for Gen AI in Capital Projects

Commonly understood industry challenges Owner/Operators realize have the potential to impact any Capital Project.



Understanding the WHAT for Gen AI in Capital Projects

Most Capital Project “Strategic Bets” align across 4 Gen AI types to better understand potential Gen AI solutions.

Permanent, always-on advisor for knowledge work, boosting productivity by putting new kinds of intelligence into human hands.

Examples :

- ❑ Advise on cost estimates
- ❑ Advise on resource optimization
- ❑ Advisor for On-demand knowledge
- ❑ Advise on commissioning issues
- ❑ Advise on PR to PO cycle

Co-pilot that significantly automates business processes & functions driving efficiency, productivity and process enhancements.

Examples :

- ❑ Automatic field reports
- ❑ Automate change impact analysis
- ❑ Automatic parametric model synthesis
- ❑ Automate system/sub-system definition
- ❑ Automate supplier onboarding

Essential creative partner, offering new ways to reach and appeal to audiences and bring unprecedented speed and innovation.

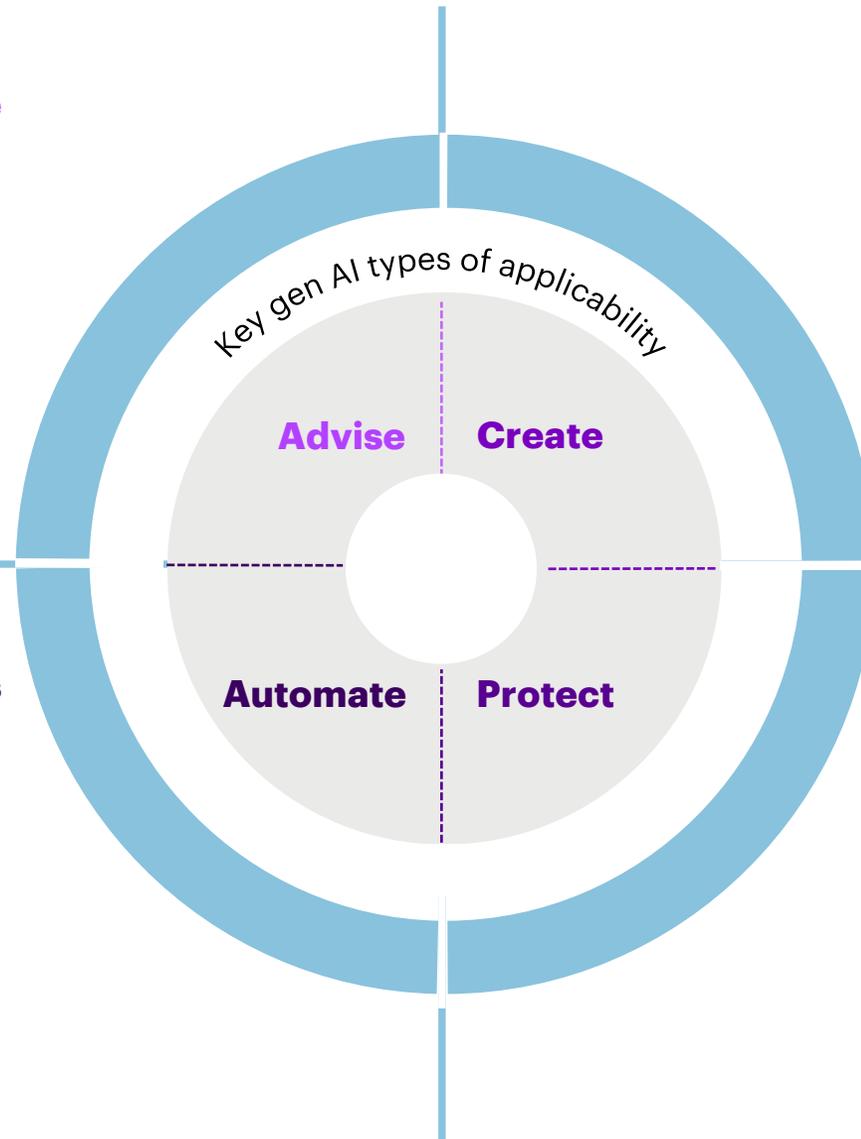
Examples :

- ❑ Create Contractual Documents
- ❑ Generate specifications and metadata
- ❑ Create personalized safety management
- ❑ Create Asset information model
- ❑ Create AWP & CWP

Assistant for governance & information security against fraud, strengthening regulatory compliances & proactively identifying risk.

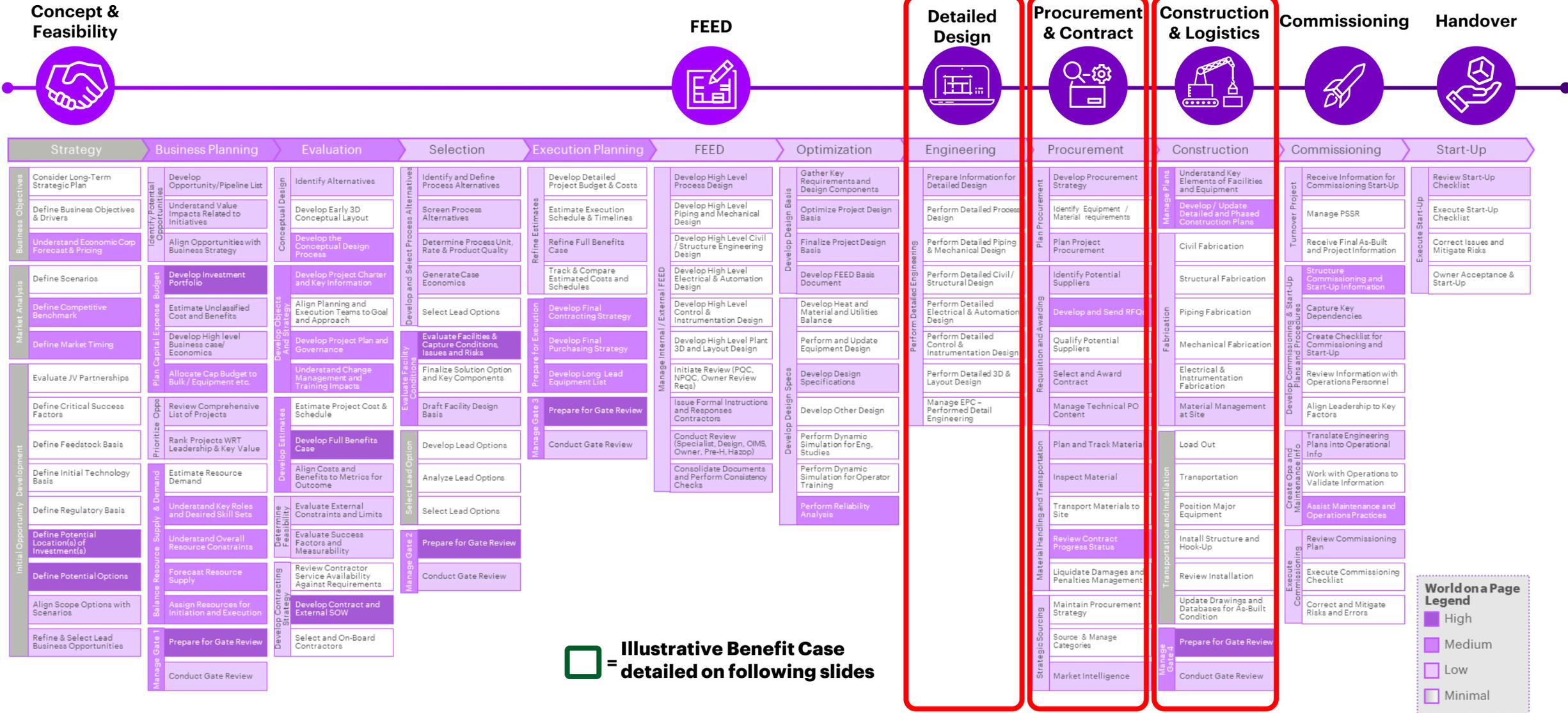
Examples :

- ❑ Protect from schedule risks
- ❑ Protect owner’s interest during procurement
- ❑ Protect from non-compliance of data standards
- ❑ Protect from environmental impacts



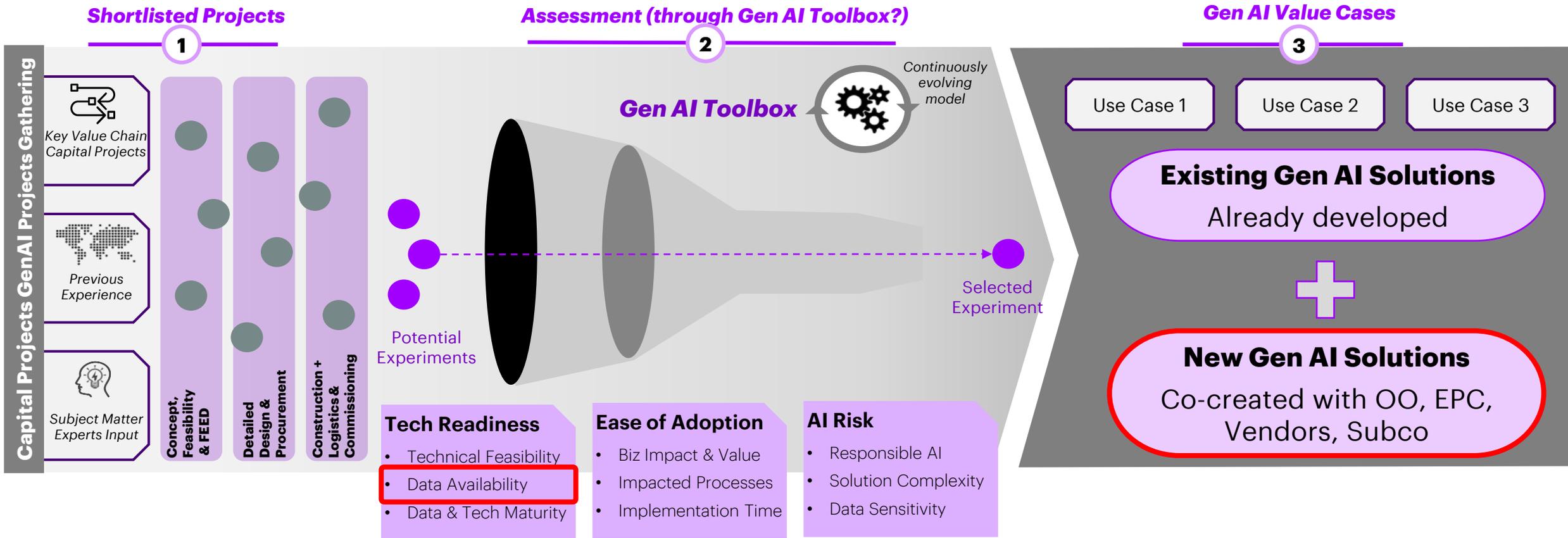
Understanding the WHERE for Gen AI in Capital Projects

We have identified key activities across the lifecycle with the highest potential impact from Gen AI initiatives.



Understanding the HOW for Gen AI in Capital Projects

Modelling an experimentation approach, assess potential pilots to leverage both existing Use Cases & co-create new Gen AI solutions



Importance of Data Contextualization in Experiments

The true power of LLM models comes from making data meaningful and therefore effective for making critical decisions

MAKE PROJECT DATA **AVAILABLE**

Data is sourced through multiple capital projects applications and integrated through connectors to make project data available.

MAKE PROJECT DATA **MEANINGFUL**

Available data is made meaningful through contextualization services like manual SME, etc. and industrial knowledge.

MAKE PROJECT DATA **USEFUL**

Meaningful data is reviewed by SMEs to modify, verify, and or even remove actions suggested by Gen AI – providing oversight on the models.

WHY DO WE NEED TO CONTEXTUALIZE PROJECT DATA?

The available data faces several challenges that may hinder organizations from unlocking the value of their data and subsequent LLM model utilization.



1. Data variety & types

Structured, unstructured and semi-structured project data, in multiple formats



2. Multiple sources

Incompatible project data ecosystems and data from siloed systems with different contexts



3. Suitable data availability

Data availability at the right time to right stakeholder and ability to share



4. Time to value from data

Project data is complex and takes longer to pre-process in desired shape for analytics and applications



5. Data quality & validity

Project data comes with a lot of noise attached to it like “null” values or wrong identifiers

WHY DO WE NEED A **“HUMAN IN THE LOOP”** FOR MAXIMIZING GEN AI OUTPUTS?

Keeping the humans that use Gen AI interactively engaged in the models’ development will help to reduce bias, remove hallucinations, and increase confidence as they realize the below goals

Increased accuracy of the models

Achieve desired accuracy for models faster

Combine human and machine intelligence to maximize accuracy

Assist human tasks with machine learning to increase efficiency



THANK YOU

