TCS/SE/109/2024-25

August 10, 2024

National Stock Exchange of India Limited
Exchange Plaza, C-1, Block G,
Bandra Kurla Complex, Bandra (East)
Mumbai - 400051
Symbol - TCS

BSE Limited
P. J. Towers,
Dalal Street,
Mumbai - 400001
Scrip Code No. - 532540

Dear Sirs,

Sub: Schedule of Analyst/Institutional Investor Meeting Presentation

This is in furtherance to our letter no. TCS/SE/96/2024-25 dated August 1, 2024. We enclose herewith the presentation made to the investors in the 'Analyst Meet 2024' held on Friday, August 9, 2024.

This interaction used a Q&A format. No Unpublished Price Sensitive Information was shared during the interaction.

The above information is also available on the website of the Company: www.tcs.com.

This is for your information and record.

Thanking you,

Yours faithfully,
For **Tata Consultancy Services Limited**

PRADEEP MANOHAR GAITONDE
Digitally signed by PRADEEP MANOHAR GAITONDE
Date: 2024.08.10 16:03:15 +05'30'

Pradeep Manohar Gaitonde
Company Secretary

Encl: As above

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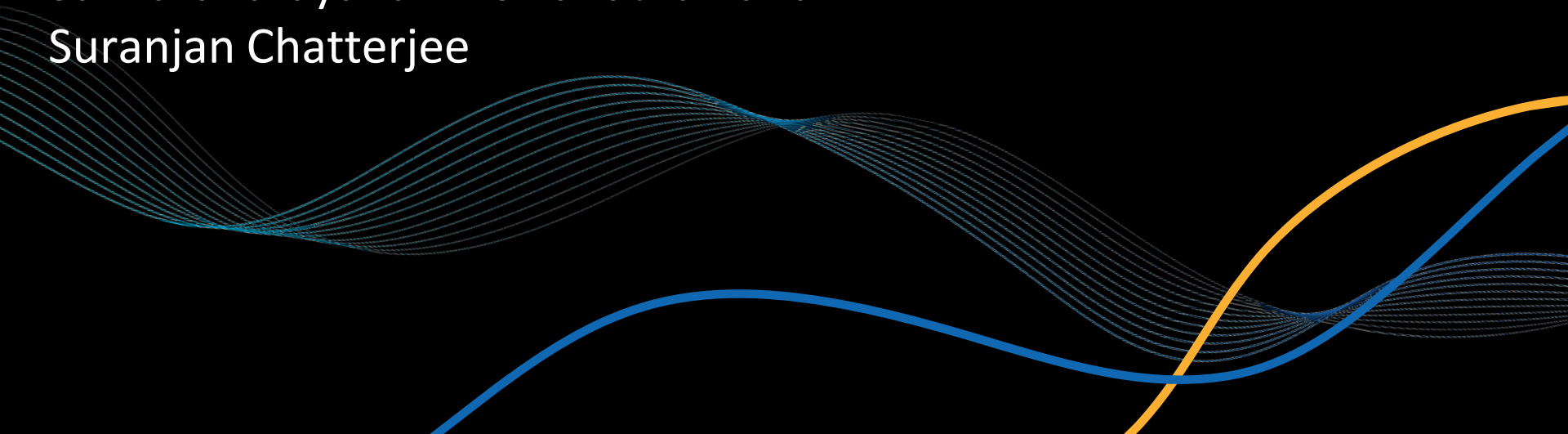
AI for AI solutions engineering

Sankaranarayanan Viswanathan and
Suranjan Chatterjee



Digital transformation : Assist humans through automation…

Digitize and standardize what is manual and slow

Infuse RPA, traditional AI &ML to drive efficiencies and consistencies

Advent of Generative AI, scales the degree of automation

Digital transformation : Paradigm shift from automation to influencing quality of outcomes

Digitize and standardize what is manual and slow

Infuse RPA, traditional AI &ML to drive efficiencies and consistencies

Advent of Generative AI, scales the degree of automation

Engineered tech leveraging gen AI to improve the quality and speed of decisioning

Bringing it all together: TCS POV | AI-first business architecture™

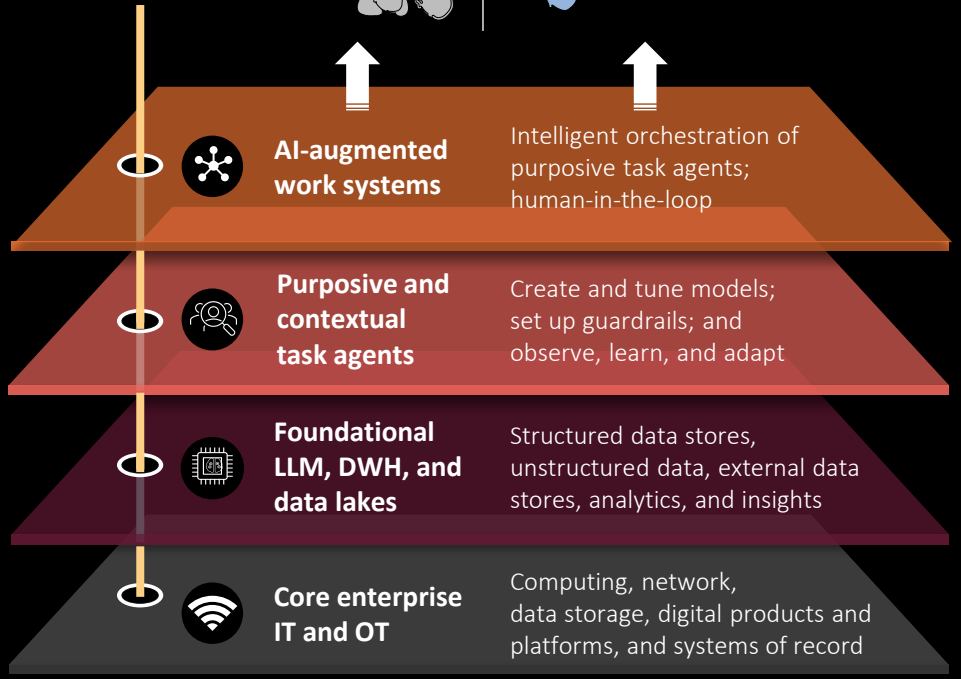
Approach to transforming knowledge work

Key to market differentiation

Employees

Customers

Reimagine Ways of Working (WoW) and "jobs to be done" to drive new value



Multitiered architecture of future AI-first businesses

Custom; AI engineering and systems integration

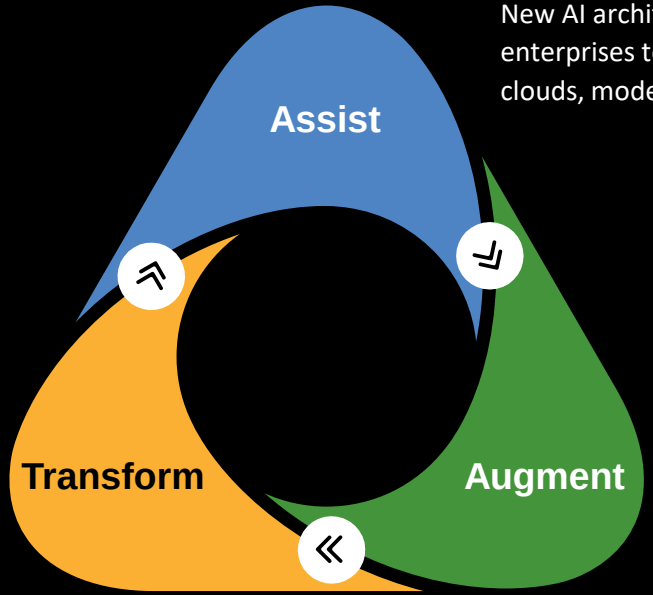
Third-party and partner-provided; open-source

Existing enterprise IT and OT

The new paradigm needs investments in three areas to unlock outcomes

Foundational enterprise AI fabric

New AI architecture that allows enterprises to harness AI across clouds, models, and providers



Value chain transformation

Transforming the knowledge value chain to deliver the right enterprise outcomes

Knowledge worker augmentation

New fabric for knowledge worker transformation resulting in transformed enterprise outcomes

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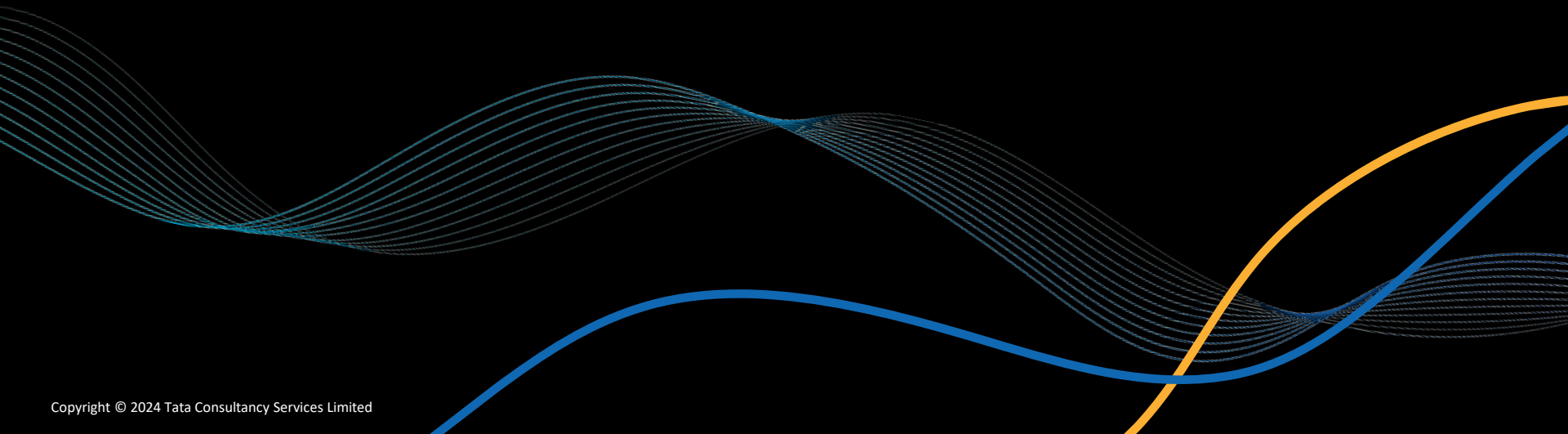

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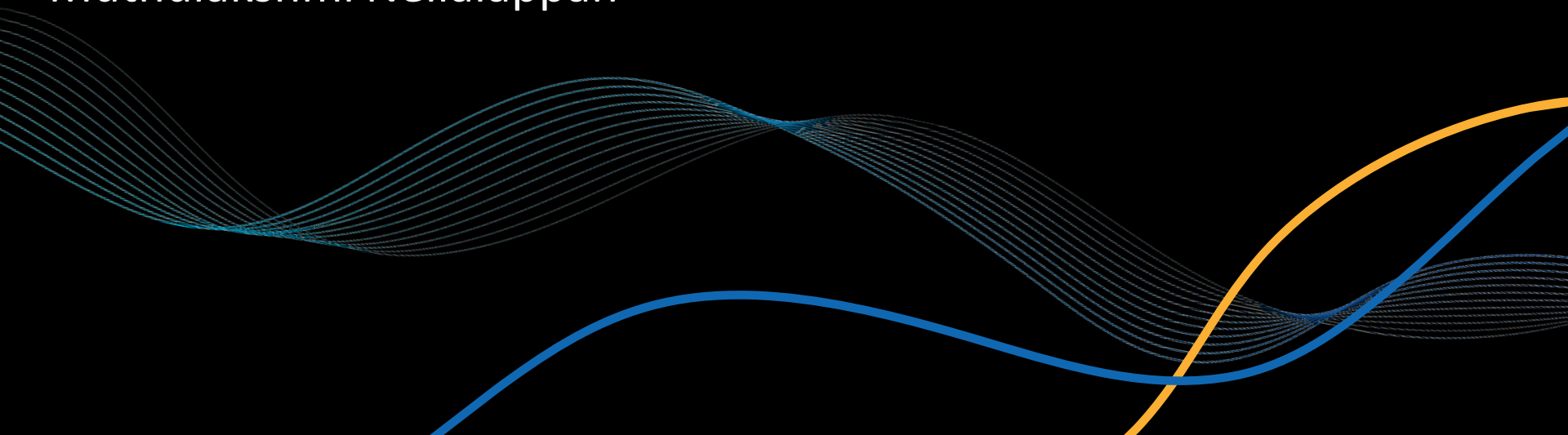
AI for Software engineering

Muthulakshmi Nellaiappan



Building software is not just writing code that most AI tools claim today …

Our focus lies in building

- Enterprise ready
- Fit-for-purpose
- Safe-to-use
- Easy to maintain software

Building enterprise-ready software

AI brings a world of opportunities; we have the responsibility to do it right

Technical complexity
Integrations, framework adherence, traceability, data availability, COTS/legacy dominance, technical debt risk

Security and compliance
Ethical use guidelines, IP rights of code/ content, data privacy, architecture standards, legal, regulatory compliance

Governance
Transparency, explainability, accountability, monitoring, guardrails, avoidance of misuse and over-reliance

Operating model
Training for prompt engineering, process changes and conditioning for auto-generated code/content, refined roles and team structure

Our guiding principles

Keep the process and artifacts in sync

Requirements to design to code to test

Harness contextual knowledge

Onboard | Consume

Leverage LLMs for what they are good at

Comprehend | Correlate | Code

Value beyond productivity savings

Speed of delivery | Improved quality

Knowledge driven software engineering

Infuses enterprise-awareness

Business processes, requirements/ user stories technology architecture, standards, compliance performance, security guidelines, operational data, procedure manuals and more…

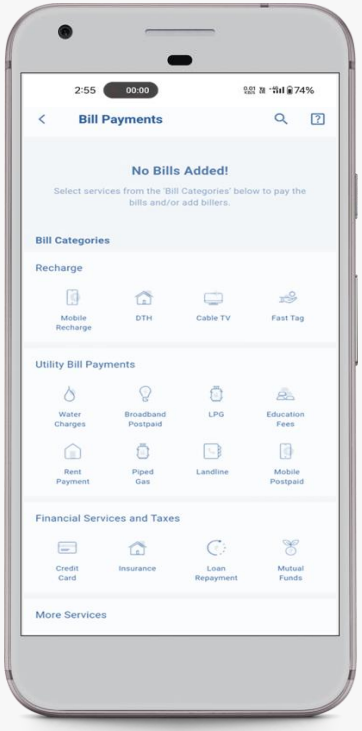
Harnesses contextual knowledge

Industry knowledge - domain, standards, frameworks; TCS knowledge - learnings from various engagements, best practices across technologies and industries

Leverages AI and generative AI

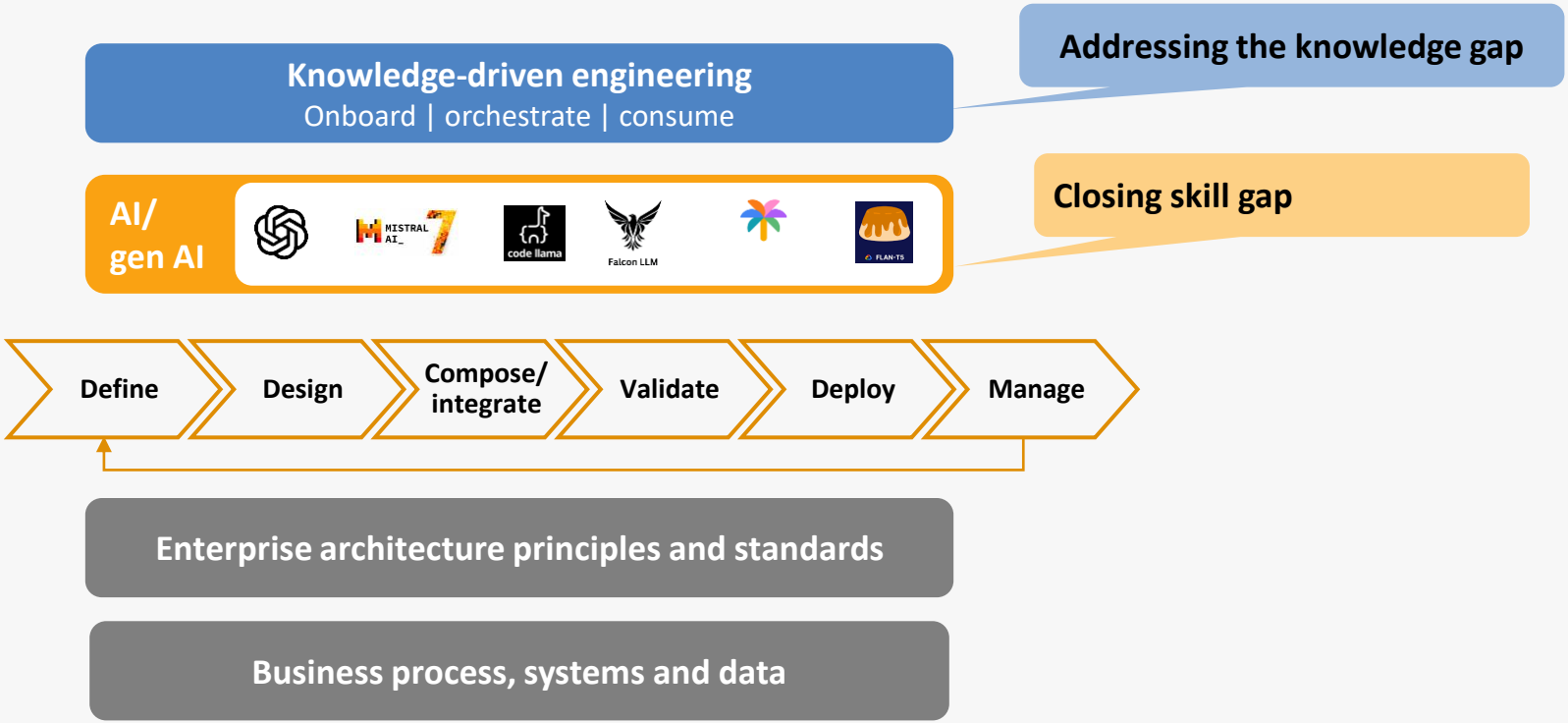
UX design to front-end code generation, solution/technical design to backend code generation, functional test scenario test case creation and more…

New mobile app channel for a leading bank ‘ABC’



Scope	New channels and features, branding revamp
Technologies	Flutter(mobile), angular(web), java
Inputs	Business requirements, user stories, visual design, coding standards
Timeline	Rollout in <18 months

Reinventing SDLC in the age of AI



SDLC re-defined by leveraging **contextual knowledge** and orchestrating **AI** models **responsibly** along with humans

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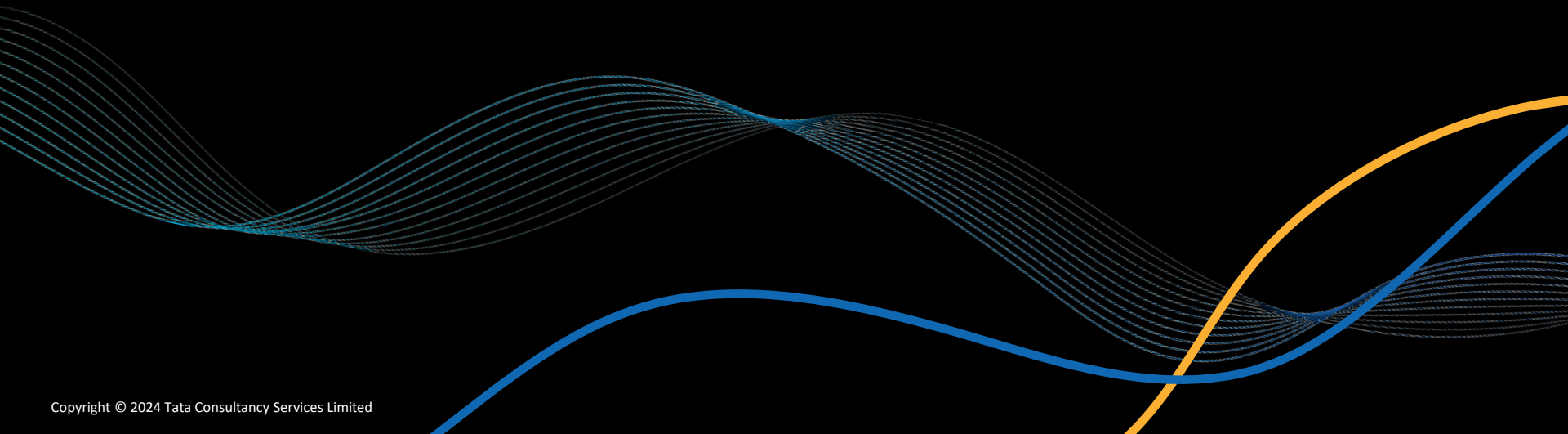

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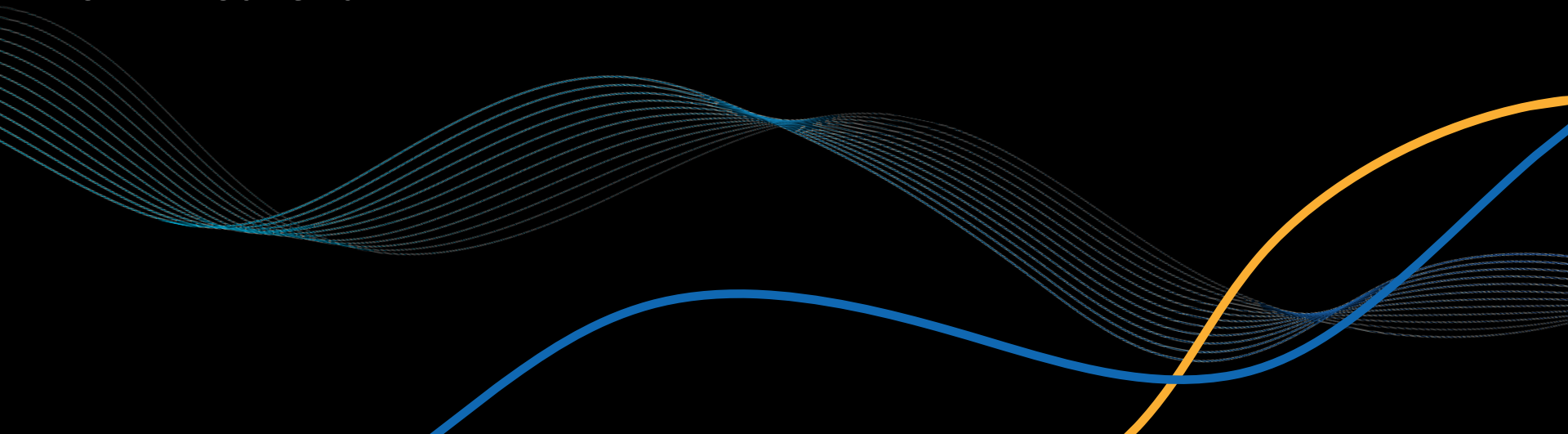
AI for Technology Modernization

Ashvini Saxena



Technology Modernization Challenges

Modernization is **not a one-time** activity

End up moving from **one legacy to another legacy**

Very **time consuming** and **high risk**

Most programs driven by **Cost and Technology Risk**; Fewer target **Value generation**

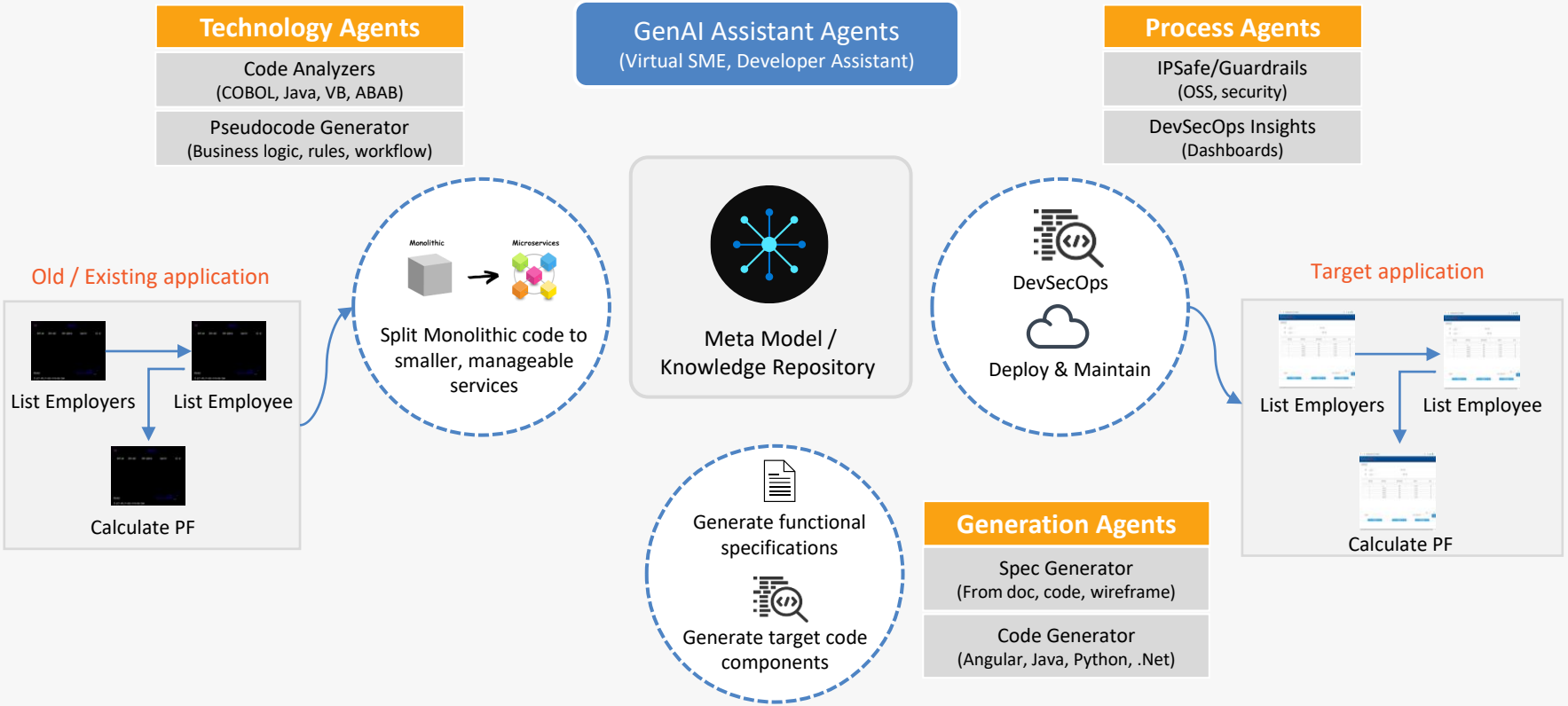
Our GenAI Driven Technology Modernization Strategy

- **Transform the existing** applications to modern technologies **faster & risk-free and future-proof** by **staying modern continuously** by combining the power of **Automation** with human **Augmentation** using **GenAI** and a time-tested proven **TCS's application meta model**

- AI Models **pre-trained** with TCS's strong **domain & technology knowledge**, 40+ years of experience in **delivering large transformation programs** and **continuous learning** of **customer context**

- Bring more than **40-70% efficiency, 2x speed** in delivering the modernization program with **100% accuracy** on the outcomes

GenAI driven Technology Modernization – Demo



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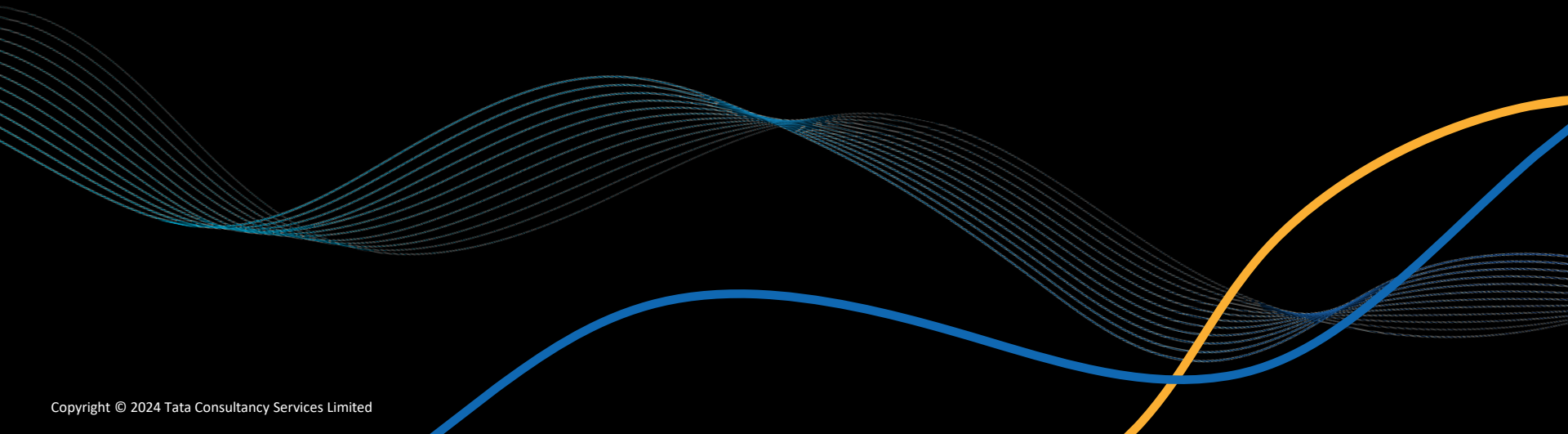

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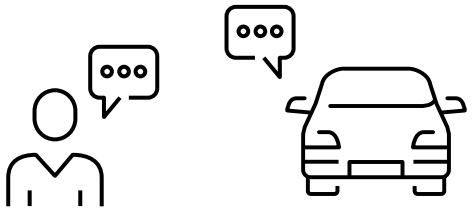
Future of Automotive

Regu Ayyaswamy and Rajendra Chougule

Era of Software Defined Vehicles (SDV)

Safety features and human-like interactions



One-time vehicle sale to feature on demand

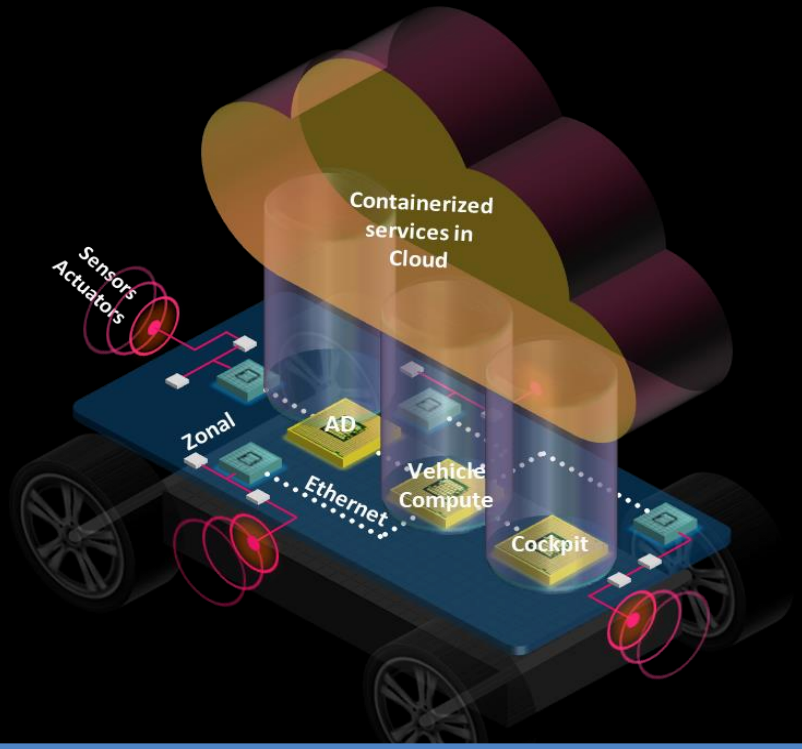
Timeline with changing business model

Current – vehicle release

~3 to 5 years

Future – feature (software release)

~2 months



Re-imagining the Complete Vehicle Architecture for enabling New ways of Customer value

TCS Solutions in SDV

AI-based Autonomous Vehicle Platform

50+ Features

25+ Patents filed

Domains

- **AI-based Autonomous Vehicle Platform (with 50+ Features Algorithm)**
  Cloud-based platform deployed on high-performance computing unit
- **Electrification Solutions**
  Design and develop integrated EV unit (3 in 1) for passenger vehicles
- **Automotive Cockpit Solutions**

SDV Platform

- Automotive Cloud Connect
- Vehicle to Cloud Diagnostics Platform Framework
- Vehicle Middleware Platform Components
- Cybersecurity - Secure Software Update Framework
- Automotive Gen-AI

Leveraging TCS Solutions for Accelerating SDV Journey

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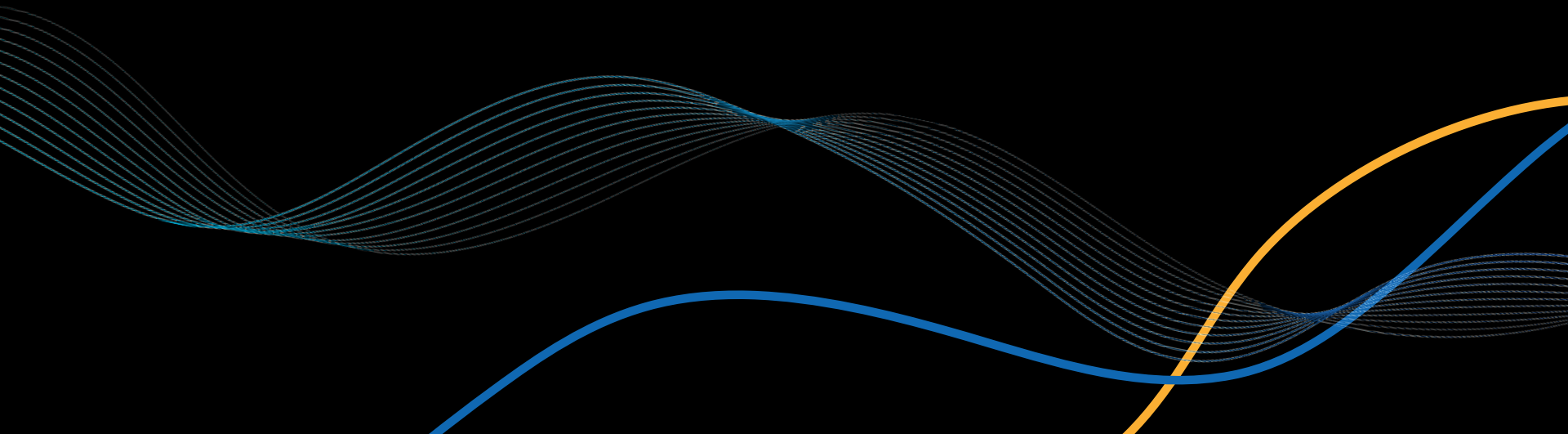
Autonomous Driving



The Challenges of Autonomous Vehicle Development

As OEM's are in the race to make the vehicles safer and automated

More Automation & safety


Lane/ Park Assist


Cruise Control


Highway/ City Pilot


Self Driving

New Features need new data

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More Scenarios


Animals


Hazards


Bicycles


Rain

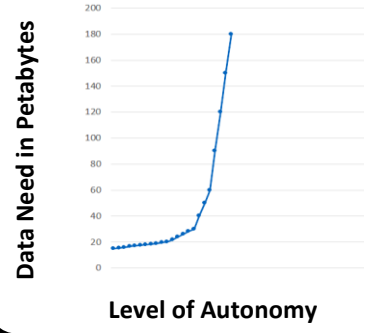

Fog


Snow

Require more real examples to meet safety targets

=

Massive Data & Efforts



- Resulting in growing data in fast scale, making more time and efforts

Gen AI to play crucial role in accelerating the adaption of advanced safety & automation

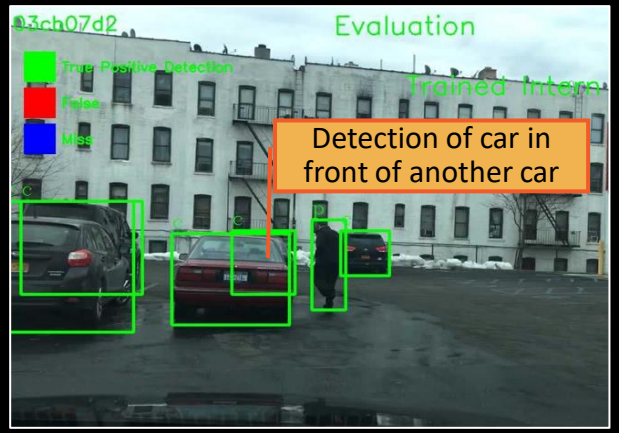
Gen-AI to enhance Autonomous Driving Experience for European & Japanese OEMs

Sensor data

Train & deploy state of the art foundation models on NVIDIA / QUALCOMM for enhanced decision making

Text/Language Based

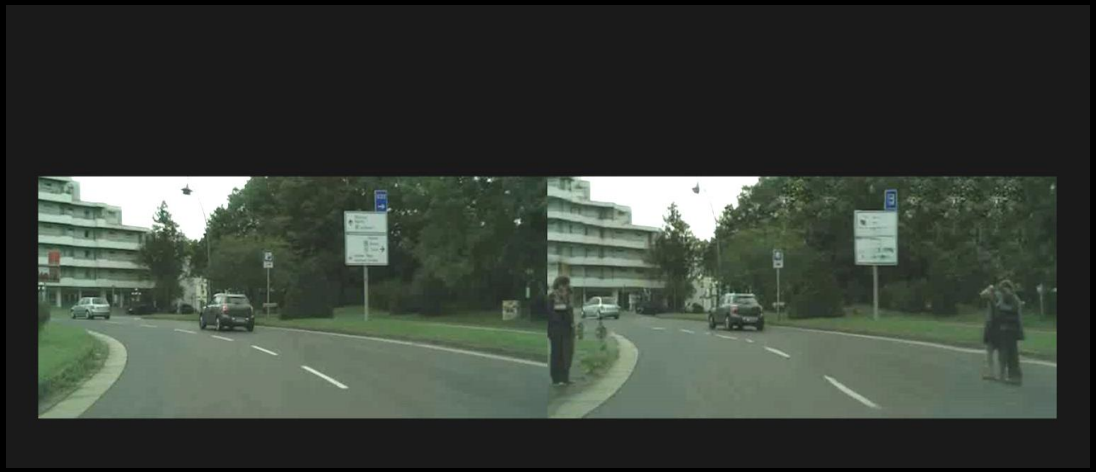
Train & test LLM models using NVIDIA NeMo framework on GPUs for scene interpretation, test case generation etc.



Creating perception algorithms for Next Generation Autonomous driving
Precision(mAP) enhancement by 21% compared to conventional AI

Gen-AI to improve safety for commercial vehicles (NA Tier-1)

Develop & deploy TCS proprietary GAN Gen-AI model to accelerate training & testing of safety features



Synthetic Data Generation with TCS patented (filed) algorithm leveraging Gen-AI GAN Model – up to 3 months faster time to production

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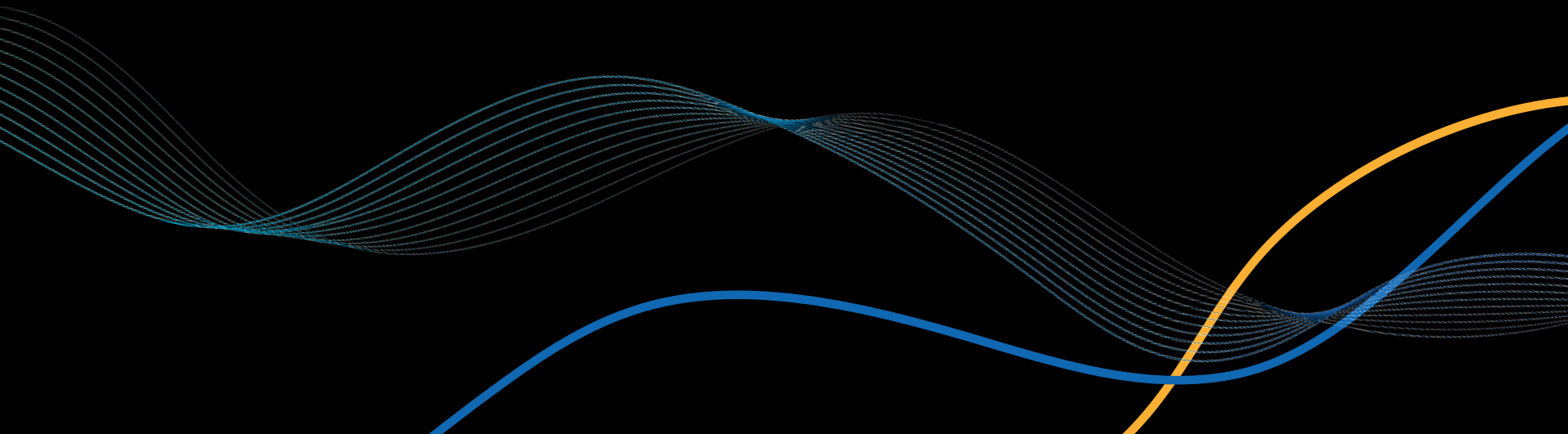
Electrification



TCS Electrification Experience

12+
Customer Engagements
18+ Years of Engagement

50+
Countries EV Infra
NA, Latin America, EUR, ASIA, Africa, Australia

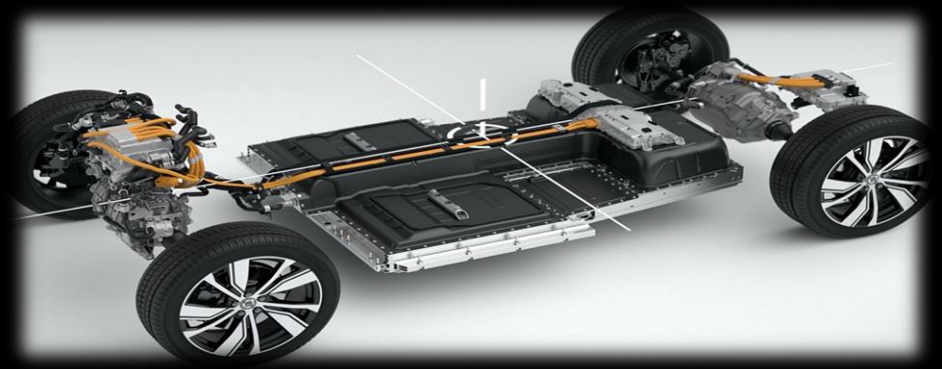
500K+
EVs on road

Charging Infrastructure

- Electrical Power Quality Check
- Regulation & Standard compliance adherence
- Charger Compatibility check (CHAdeMO and Combo)
- Off-board Charging system
- Vehicle-to-Grid and Vehicle-to-Home

Inside the car

Onboard Charger | DC-DC Converter | Motor Drive



Vehicle Control Unit | Power Distribution Unit | Battery Management System

EV Charging Solution (3 in 1)

Charging Protocol Tester (CPT)

Key EV Consortiums & Partners

CHAdeMO
Ansys
CHARIN
ARAI Progress through Research

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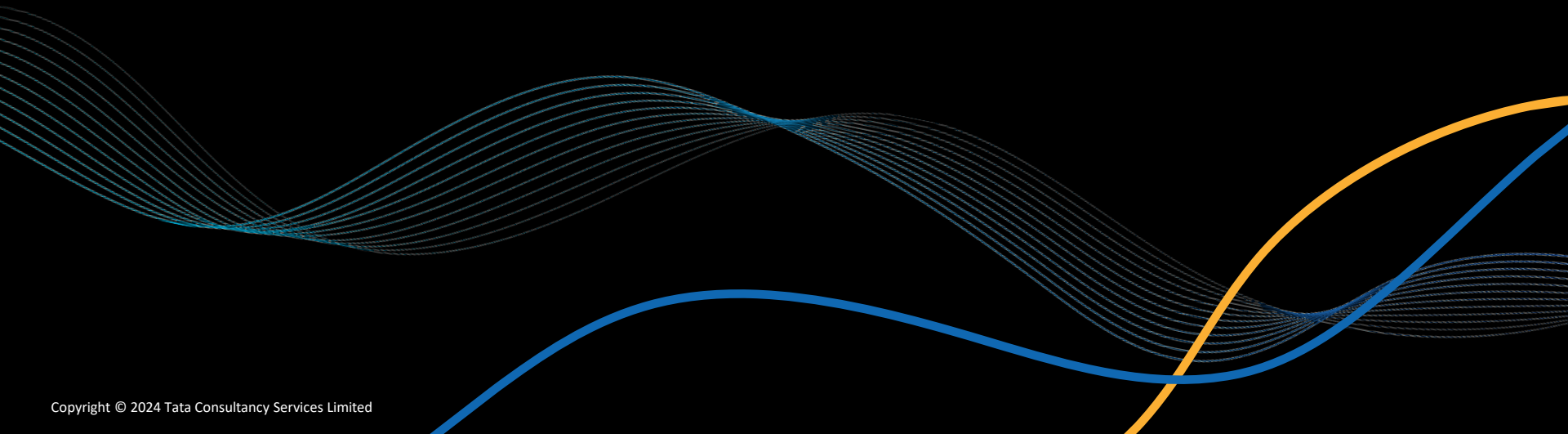
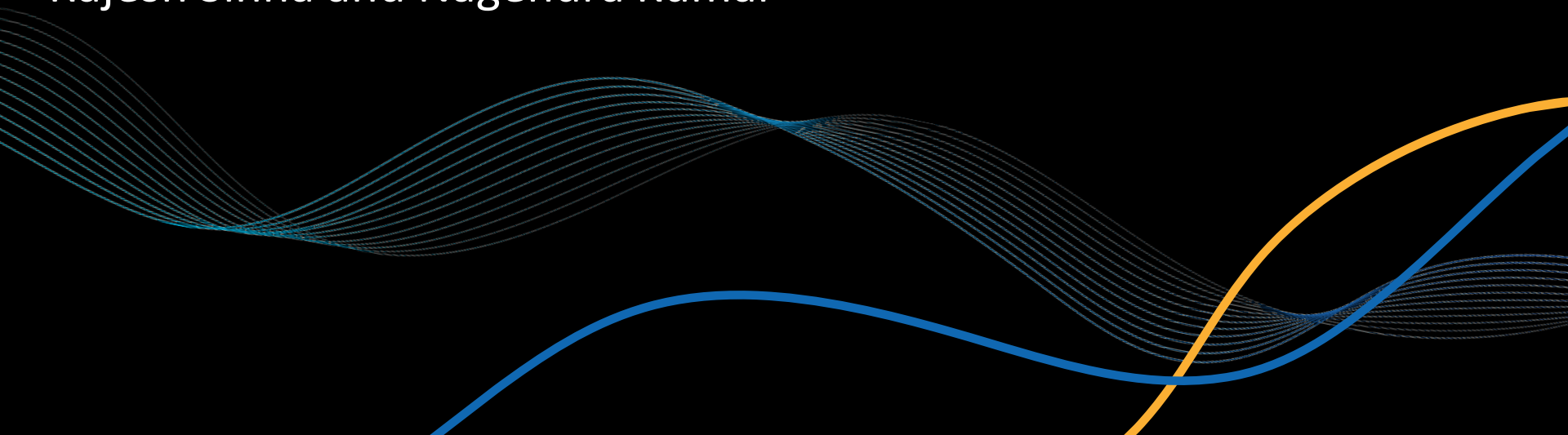


Future of Logistics and Physical Work

Rajesh Sinha and Nagendra Kumar



Future of logistics & physical work

Aging societies and decline in workforce participation

Imperative: **Workplace & Work redefinition**

- Purpose-Driven, Rewarding, Respected Work Profile
  - Assist, Amplify & Augment human performance with Technology

Machines can easily do what people find difficult to do, and vice versa

Imperative: **Hybrid workforce (judicious blend of people & robots)**

- Single task, programmed, low-adaptation robots ("specialists at work")
- Rise of "versatile" robots
  - Supported by brain-body congruence, physics-based world models, bio-inspired mechanisms & actuations, and understanding social & work norms)

2x growth in cargo volume by 2040

Imperative: **Rise of the "Physical Internet" to meet future logistics demand**

- Transport of sustainable, routable & reconfigurable π containers over shared infrastructure
  - Redefined robotics deployment to drive efficiency and agility to support future scale of work.

Future of logistics & physical work | RoboVerse

Vision

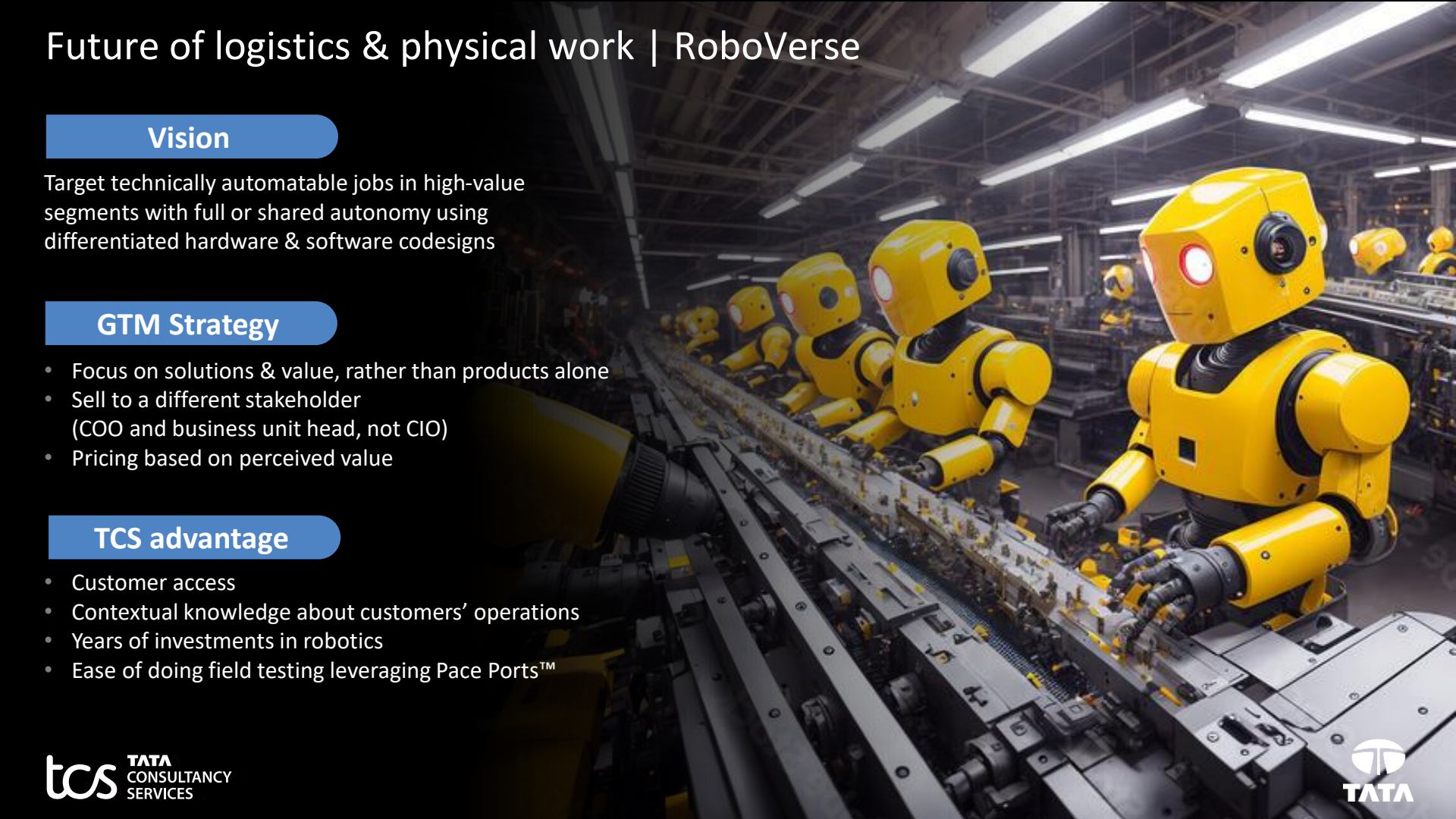
Target technically automatable jobs in high-value segments with full or shared autonomy using differentiated hardware & software codesigns

GTM Strategy

- Focus on solutions & value, rather than products alone
- Sell to a different stakeholder (COO and business unit head, not CIO)
- Pricing based on perceived value

TCS advantage

- Customer access
- Contextual knowledge about customers' operations
- Years of investments in robotics
- Ease of doing field testing leveraging Pace Ports™



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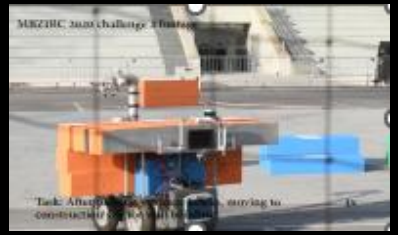
RoboVerse Now …



Vision

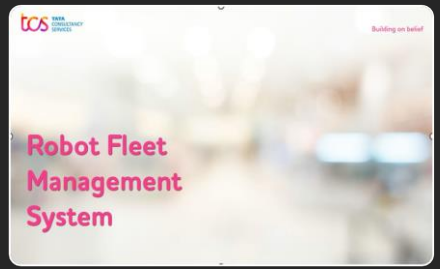
AI enabled intralogistics operations within DCs, warehouses, sorting centers

Differentiation

Geometric navigation in changing env, multi-task capabilities, disturbances in object poses

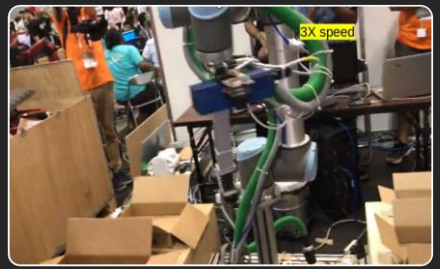
Solution

Hardware Software Codesign - 1st to Market



Wall to wall work orchestration & optimization system for heterogenous robots

Software Only



Domain-dependent, independent & language-guided piece picking and singulations for fulfilment centers

Assembled from off the shelf Components & TCS Software Controller

Online 3D bin packing based **outbound and inbound gate operations for loose loads**

TCS owned end of arm tools and software controller with off-the-shelf hardware

RoboVerse Next | The future

Autometa Orchestrator

Integrate, coordinate and optimize staff, robots, conventional automation, tele-operated machines, IoT infrastructure

Adaptive work fragmentation, allocation and coordination support wide variety of capabilities of legged, wheeled, static/mobile manipulators for single/many tasks to single/many executors

Adapts to domain contexts wall-2-wall facilities support for sorting centers, fulfilment centers, last-mile, classic warehouse, manufacturing execution

Shared-autonomy dual-arm retail restocker

Robo-brain

Bioinspired software brain for control & orchestration within the robot. Rapid acquisition of new skills and task learning from variety of sources. Workplace norms/social nuances learnt through expert human strations.

All-terrain, quadruped with manipulators

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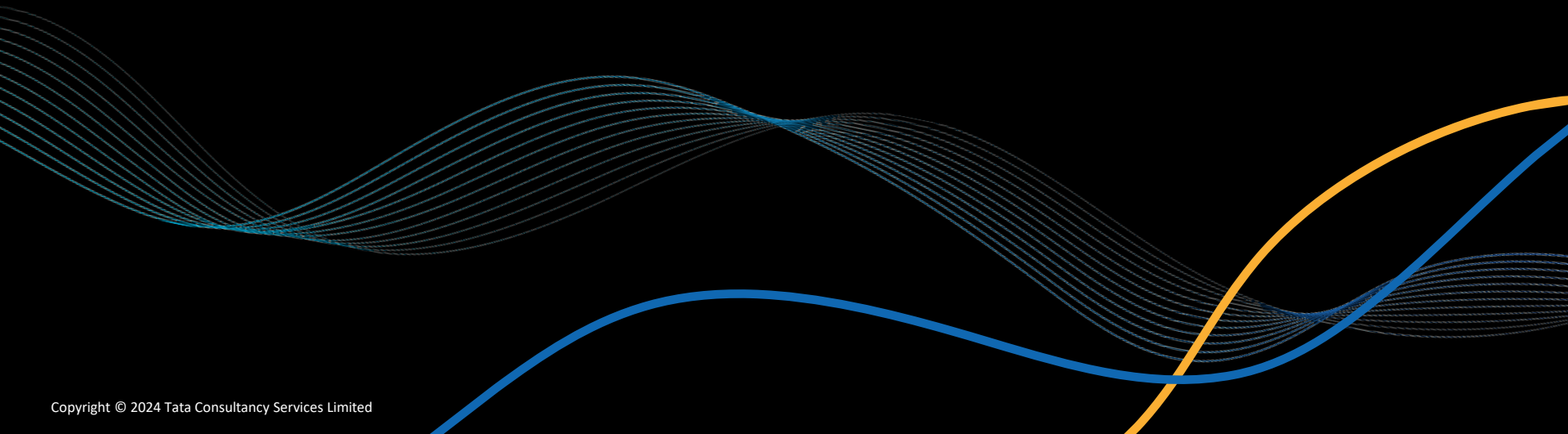
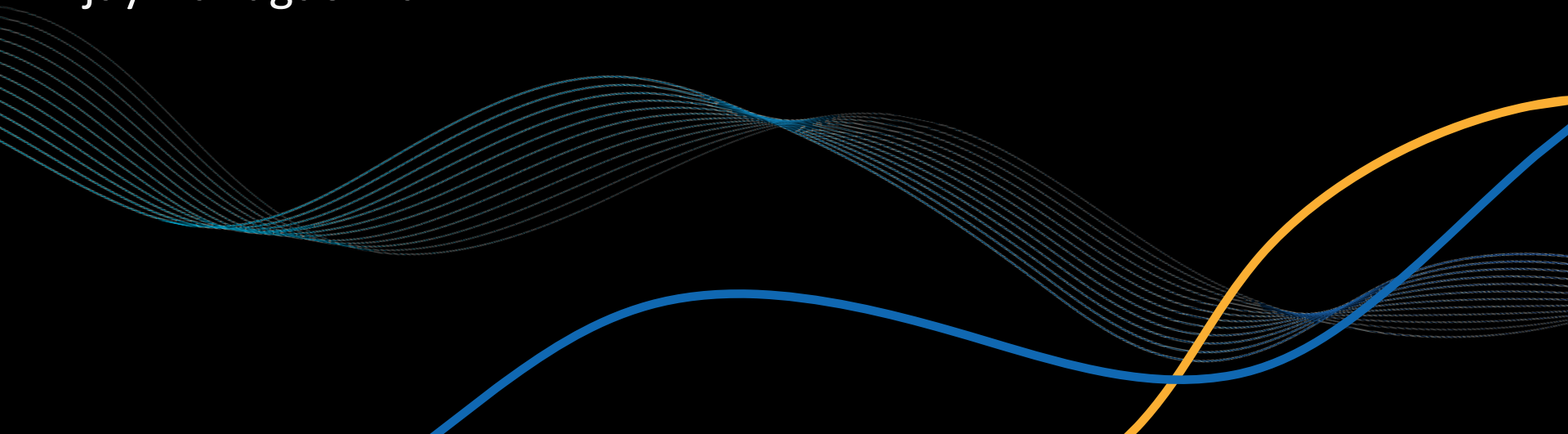


Co-creating futures with our customers

Ajay Nandgaonkar

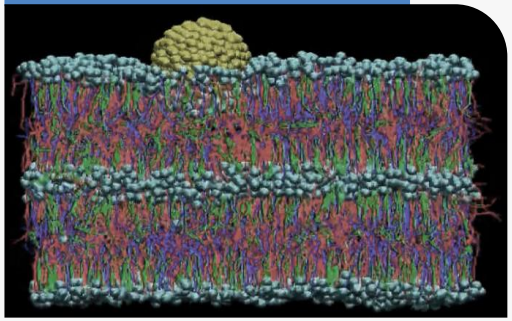


Co-creating futures with our customers : #Many-Examples

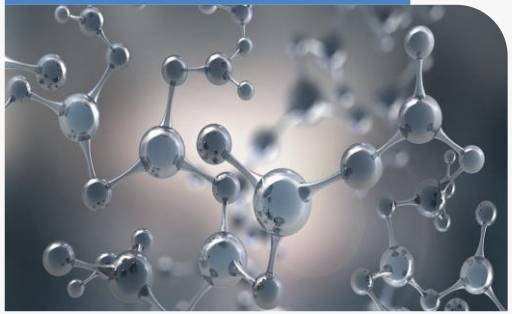
Power Plants : IP2™

Transforming Steel

Digital Skin

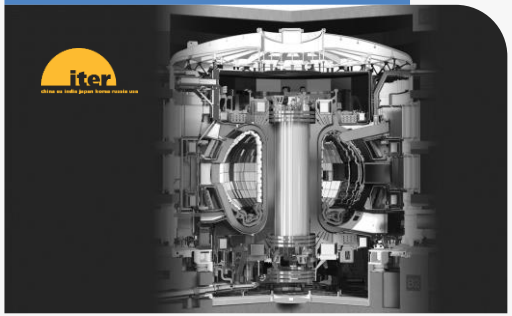


Novel Materials



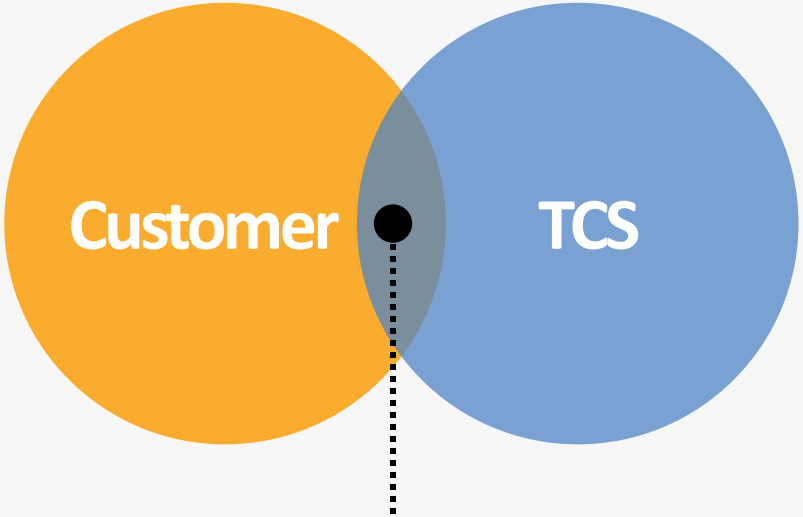
Unconventional Assets

Big Science: Sun in a box



Co-creating futures with our customers

- Business Priority
- Domain Expertise

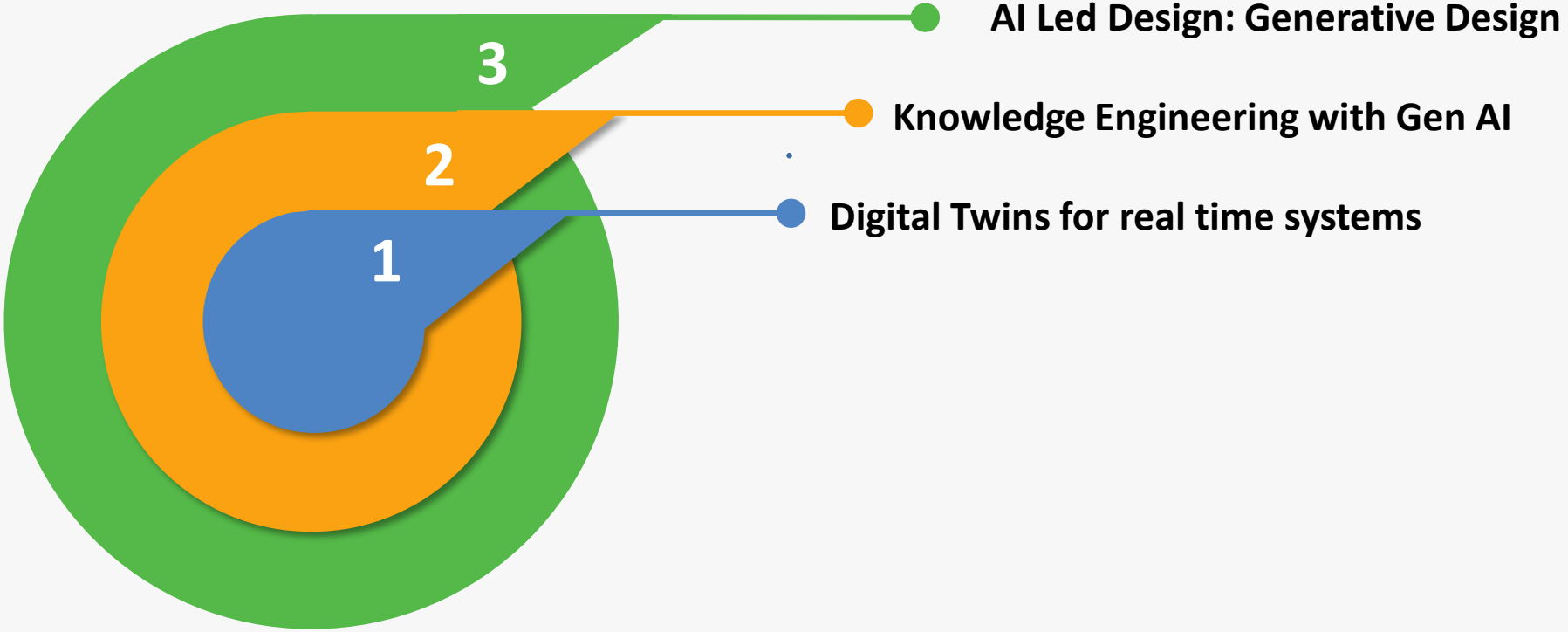


- Scale
- TCS IP
- Alliances

Synergy that drives

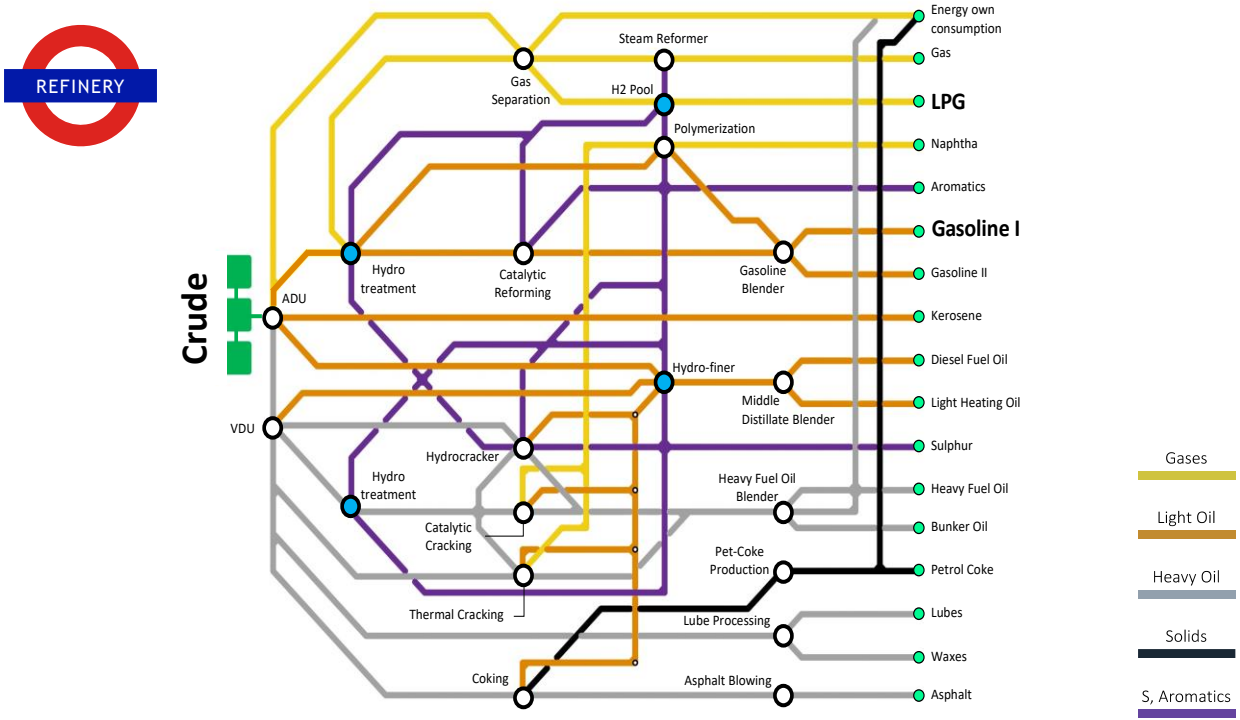
#Industry First innovations

#Industry-First #Examples



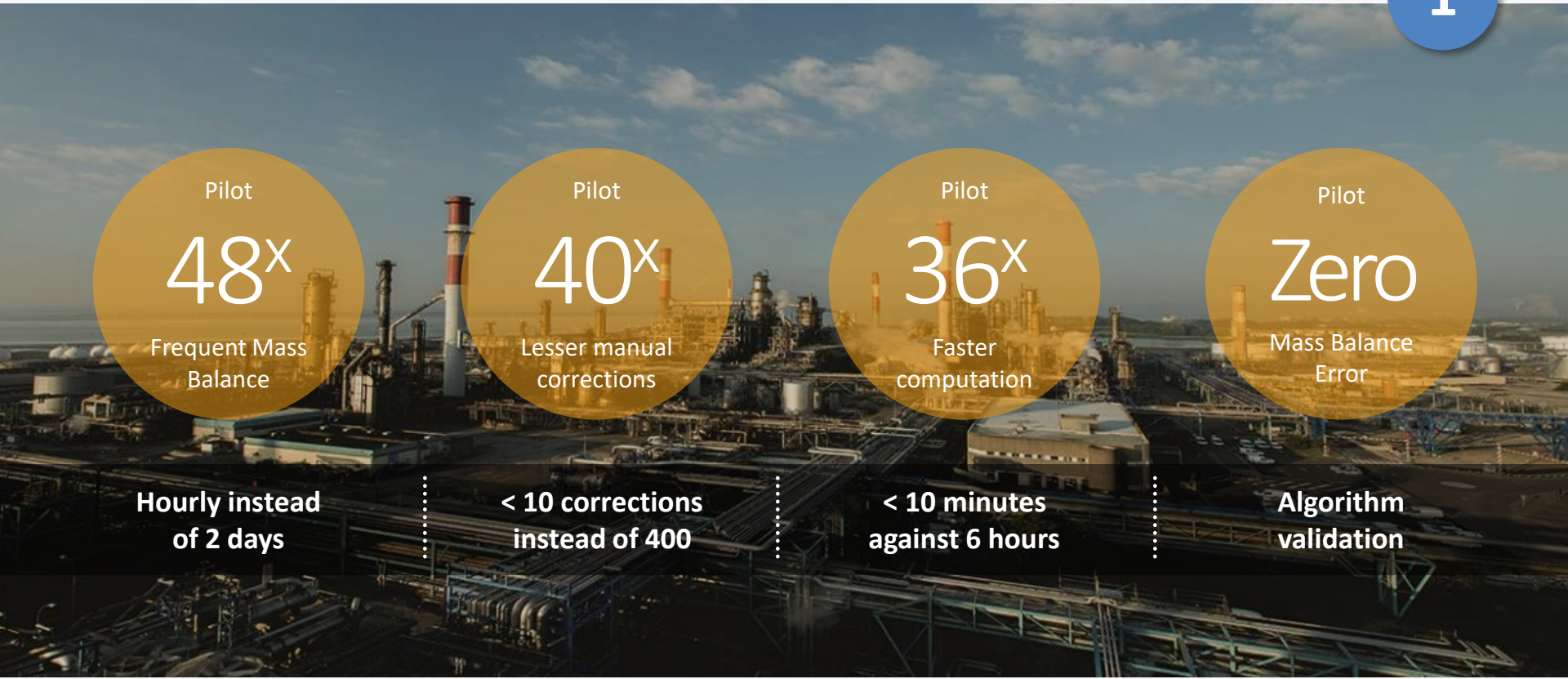
Molecular thread - google map of flowing molecules

1



#Industry-First #Pilot

1



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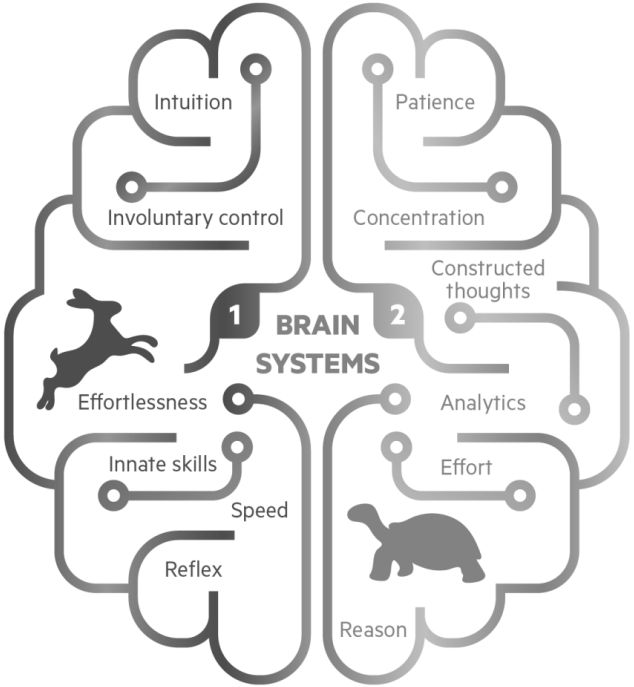
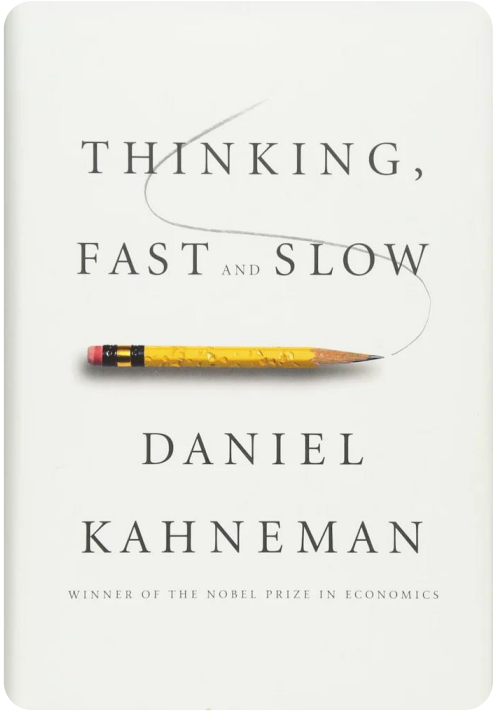
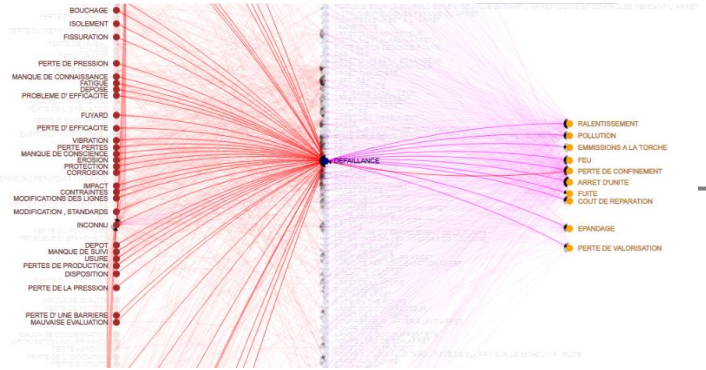

Intuition
Involuntary control
Patience
Concentration
Constructed thoughts
1
BRAIN SYSTEMS
2
Effortlessness
Analytics
Innate skills
Speed
Reflex
Effort
Reason


THINKING, FAST AND SLOW
DANIEL KAHNEMAN
WINNER OF THE NOBEL PRIZE IN ECONOMICS

#ORA – The Operations Risk Advisor

2

Create Fault-tree graphs for the equipment (e.g. FCC)
via Reports, OEM Documents and incident management tools.



Create Alarm Graphs Machine Learn Alarms, their sequences from Historical Plant Data from Systems such as DCS Events, Historians, SAP. (LSTM)

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Create Ontology
Stored as knowledge elements in a structured format.

Enriched by Dynamic Simulators and captured Operator actions.

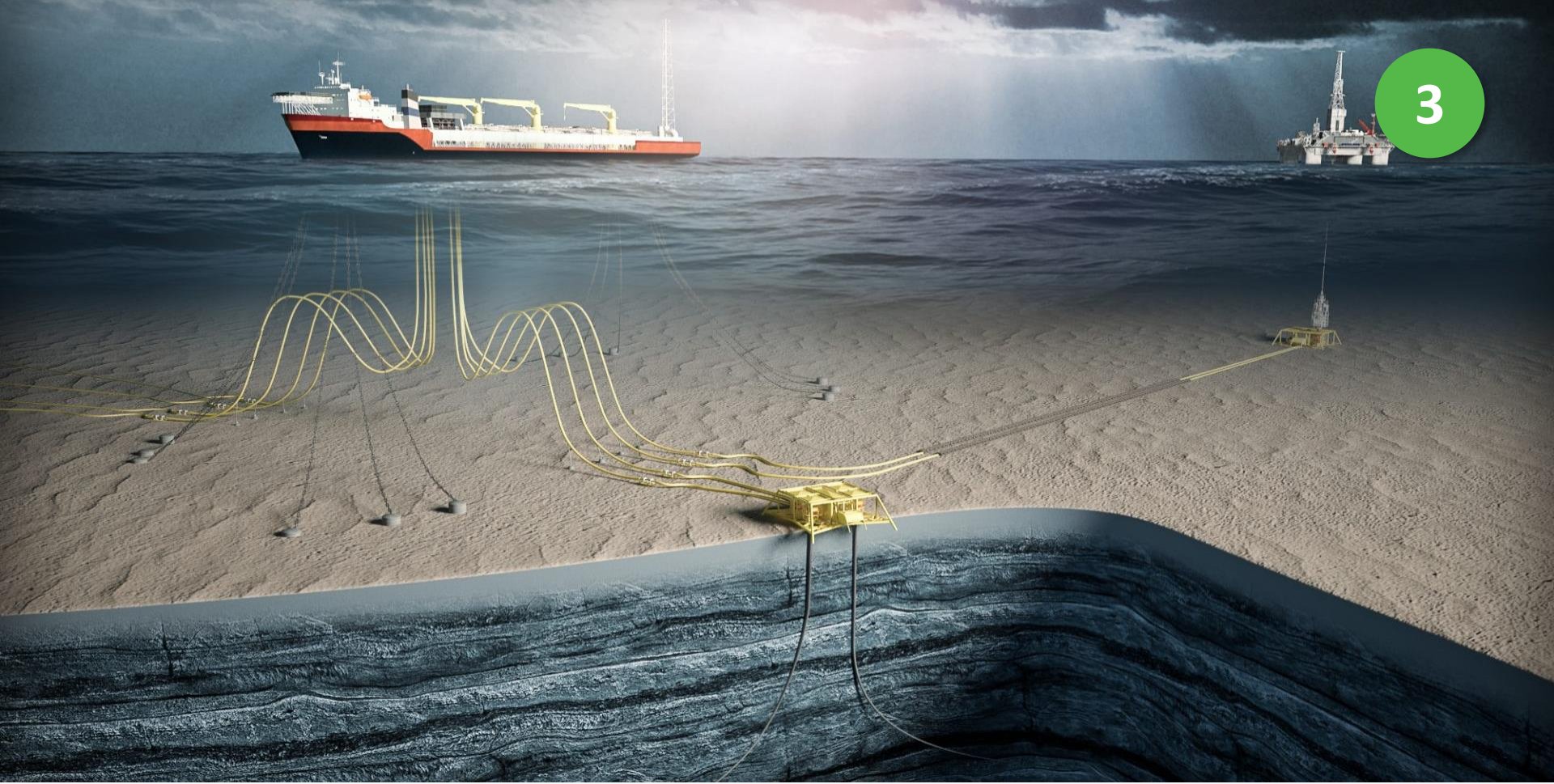
The #ORA App

Monitor
Process and Alarms

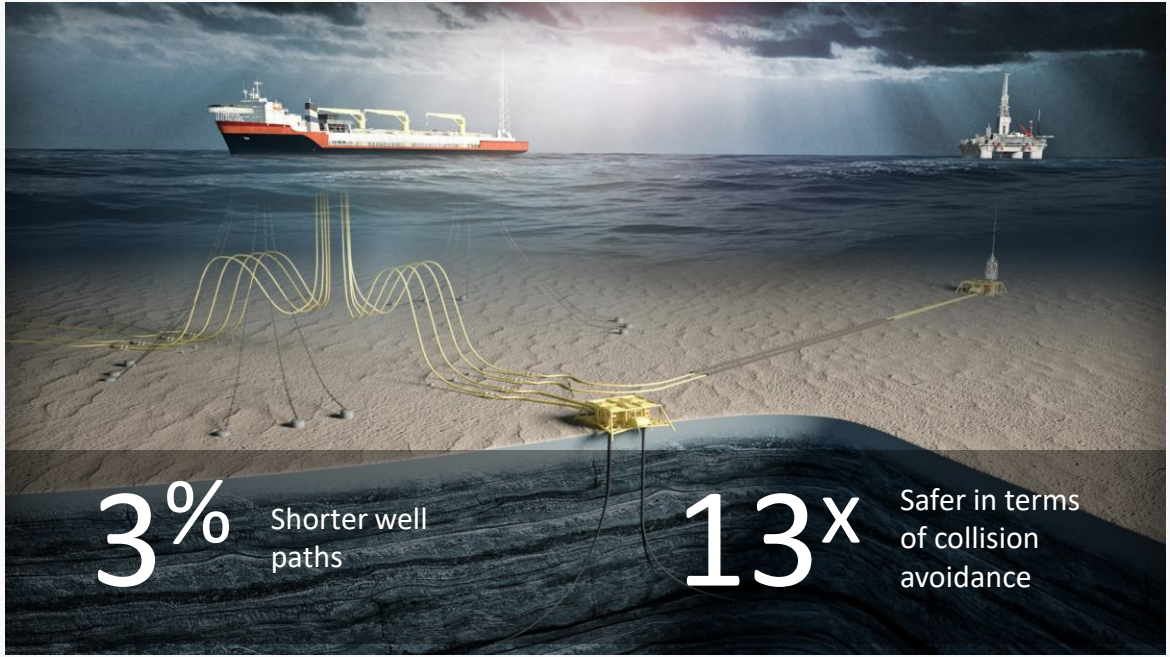
Diagnose
Process Deviations and Alarms.

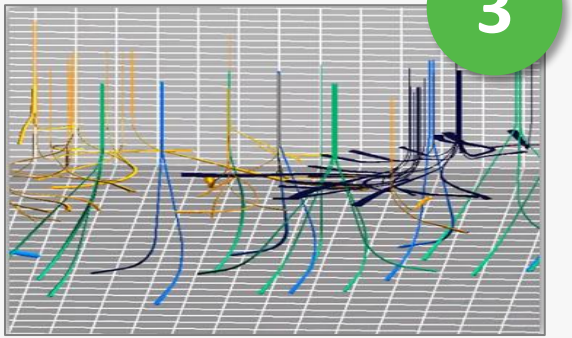
Predict
Upcoming Alarms and failures (with a P)

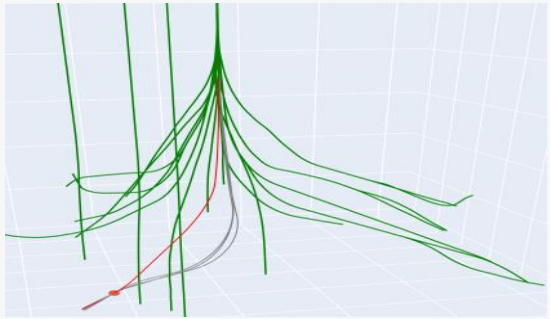
Prescribe
Potential Actions
To avoid failures, manage alarms.


3

#Generative #Design







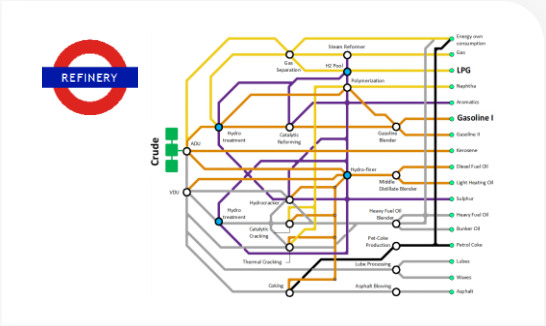
3

Designing well trajectories with the Generative Design approach : AI for Design

Multi-well Scenario ● Automated identification of neighboring wells as “At Risk” ● Automated well trajectory change to eliminate “Collision Risk” ● Optimized well length using measured depth (MD) and collision avoidance ● Supporting special cases including “Sidetrack” ● Directly into production from “Explore”

#Industry-First #Innovations

Twins 1

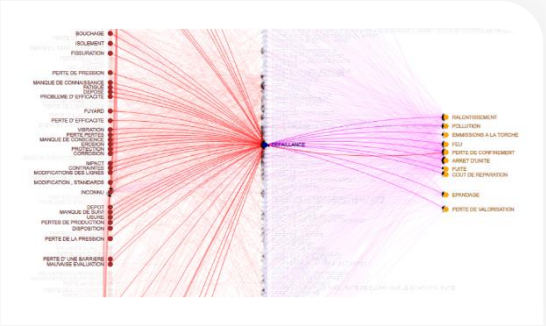


AI based

Plant-wide mass balance

Improves refining margins

Knowledge 2

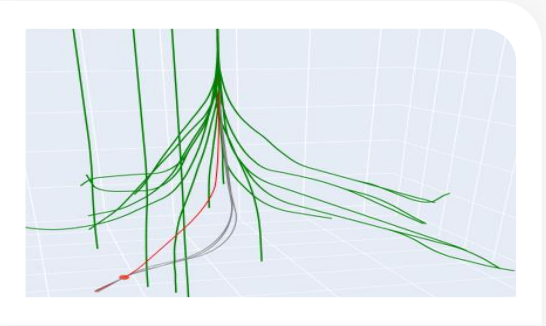


AI Augmented

Operations Risk Advisor

1% enhanced availability

Design 3



AI Led

Well Trajectory Design

3% Shorter ; 13X Safer

New Ways of Working!

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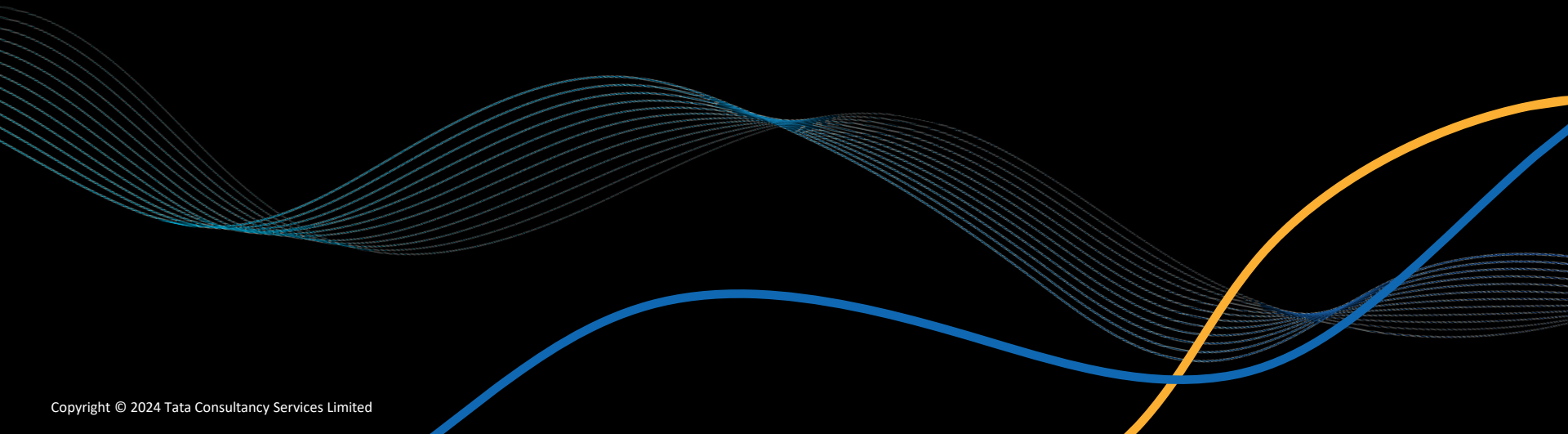
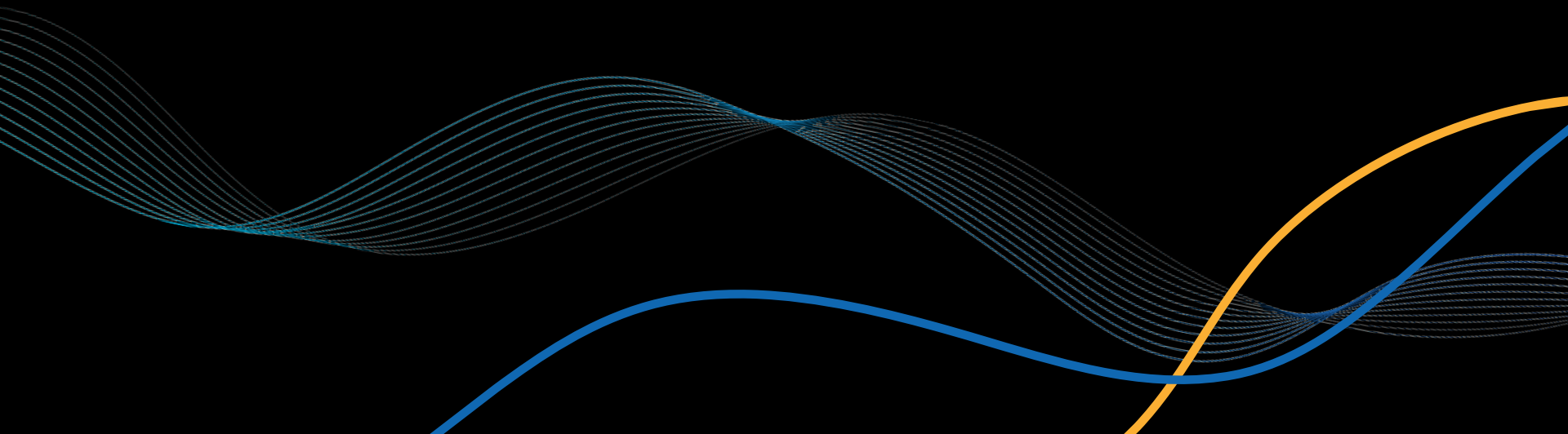
Thank you



Summary

Dr. Harrick Vin



Accelerating growth | Bi-modal strategy

Mode 1: Improve current value

- Leverage AI to improve productivity
- Co-create and participate in customers' AI journey

Mode 2: Redefine value to consistency & future-proofing

- **Elite by-design** of knowledge work output***, delivered fast!***
  - Reduce reliance on tacit knowledge
    (wisdom & expertise at fingertips)
- Make enterprises **dynamic** (perpetually-adaptive)
  - Invent & adopt next-practices continually
    (enhance value, by design)

Mode 2 drill-down | New “future-proof IT” offerings

Future of digital products engineering & maintenance

- Near-zero change latency & surprises
- Near-zero manual ops by design

Future of technology modernization

- Near-zero legacy drag by design

Future of technology operations

- Resilient & proactive operations (predict & respond, rather than detect & react)

Mode 2 drill-down | New “future-proof business” offerings

Future of enterprise functions

- **Talent engagement:** personalized @ scale
- **Marketing:** elite-by-design campaigns
- **Sales:** augmentations to turn good to great
- **Customer success:** delight by-design
- …

Future of industry functions

- **Warehouse management:** human-robot collaboration
- **Manufacturing operations:** real-time digital twins
- **Energy management:** decentralized “energy internet”
- **Chemical products engineering:** AI-driven design
- **Illness & wellness management:** AI-powered screening, diagnosis & treatment
- …

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Thank you