

June 13, 2023

The General Manager  
**BSE Limited**  
Corporate Relationship Department  
Phiroze Jeejeebhoy Towers  
Dalal Street  
Mumbai- 400 001

The Manager  
**National Stock Exchange of India Limited**  
Listing Department  
Exchange Plaza  
5th Floor, Plot No. C-1, Block-G  
Bandra-Kurla Complex, Bandra(E)  
Mumbai-400 051

**BSE Scrip Code: 532281**

**NSE Scrip Code: HCLTECH**

**Subject: Presentation made in a Webinar hosted by Citi on 'Generative AI'**

Dear Sir/ Madam,

Enclosed please find a presentation made to the investors today by Mr. Kalyan Kumar, *Global CTO and Head, Ecosystems* of the Company in a Webinar hosted by Citi on 'Generative AI'.

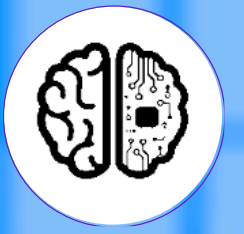
This is for your information and records.

Thanking you,

Yours faithfully,  
For **HCL Technologies Limited**

**Manish Anand**  
**Company Secretary**

Encl:a/a



# Generative AI@HCLTech

Kalyan Kumar (KK)

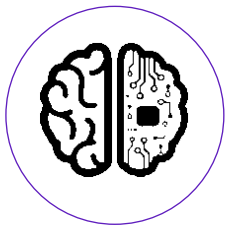
Global CTO and Head, Ecosystems, HCLTech

Twitter: @kklive

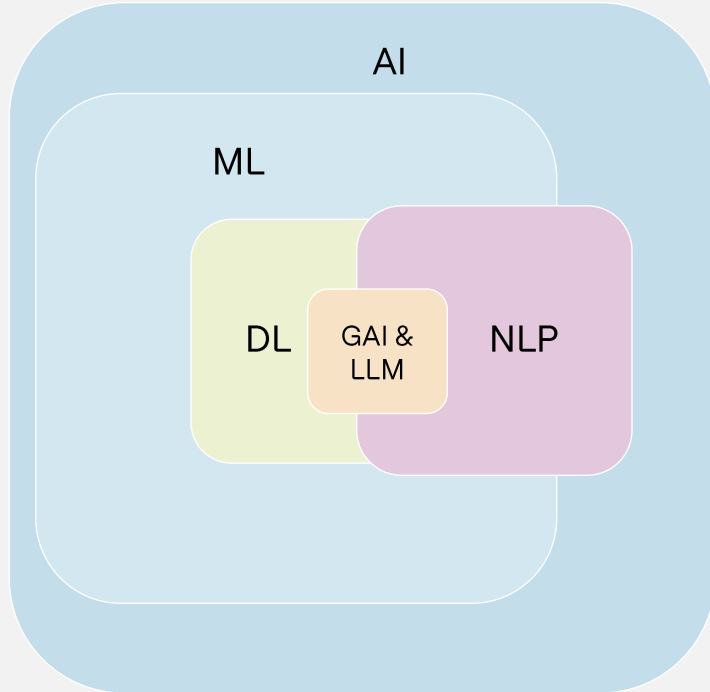
(<https://www.hcltech.com/ai>)

# Topics

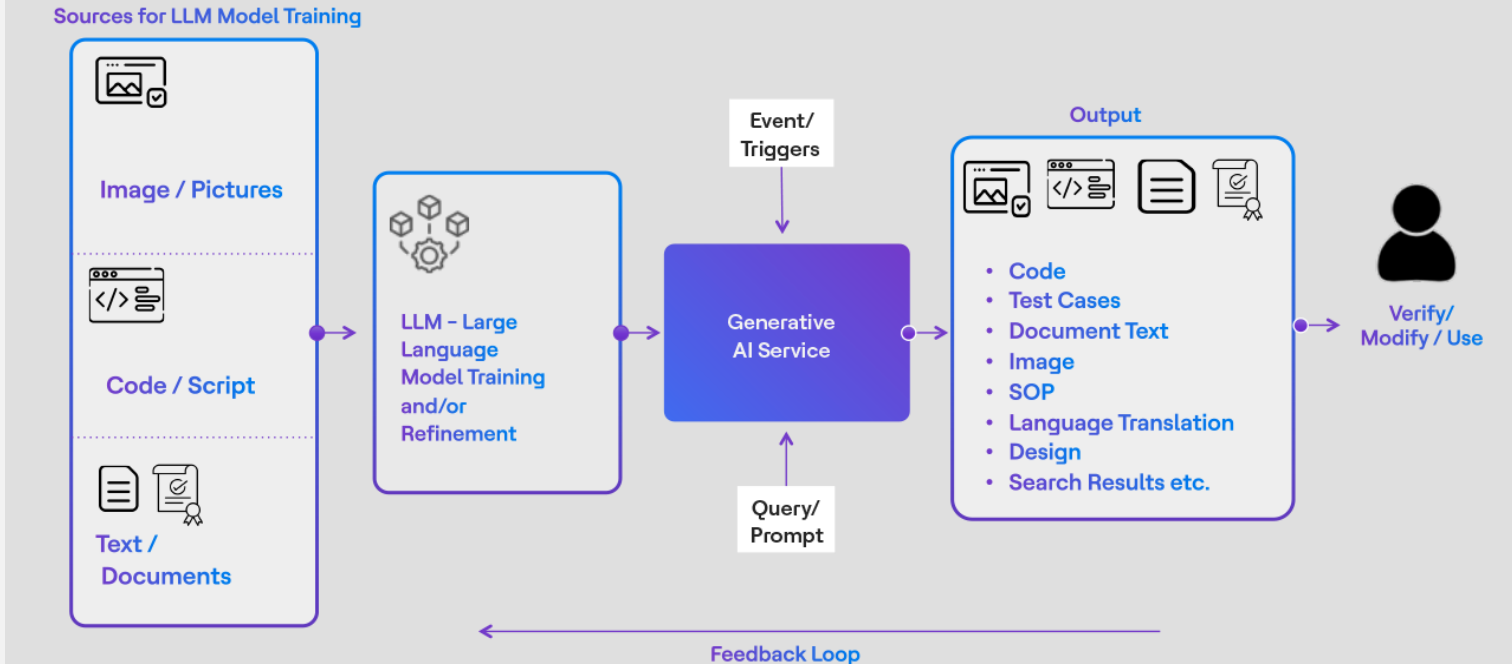
- Understanding Generative AI
- Value Streams around Generative AI
- Generative AI@HCLTech Services
- Generative AI@HCLSoftware
- Q&A



# Understanding Generative AI



## How it Works?



Source: Adapted from Gartner (786698\_C)



NLP (Natural Language Processing) (NLU and NLG)



Machine Translation

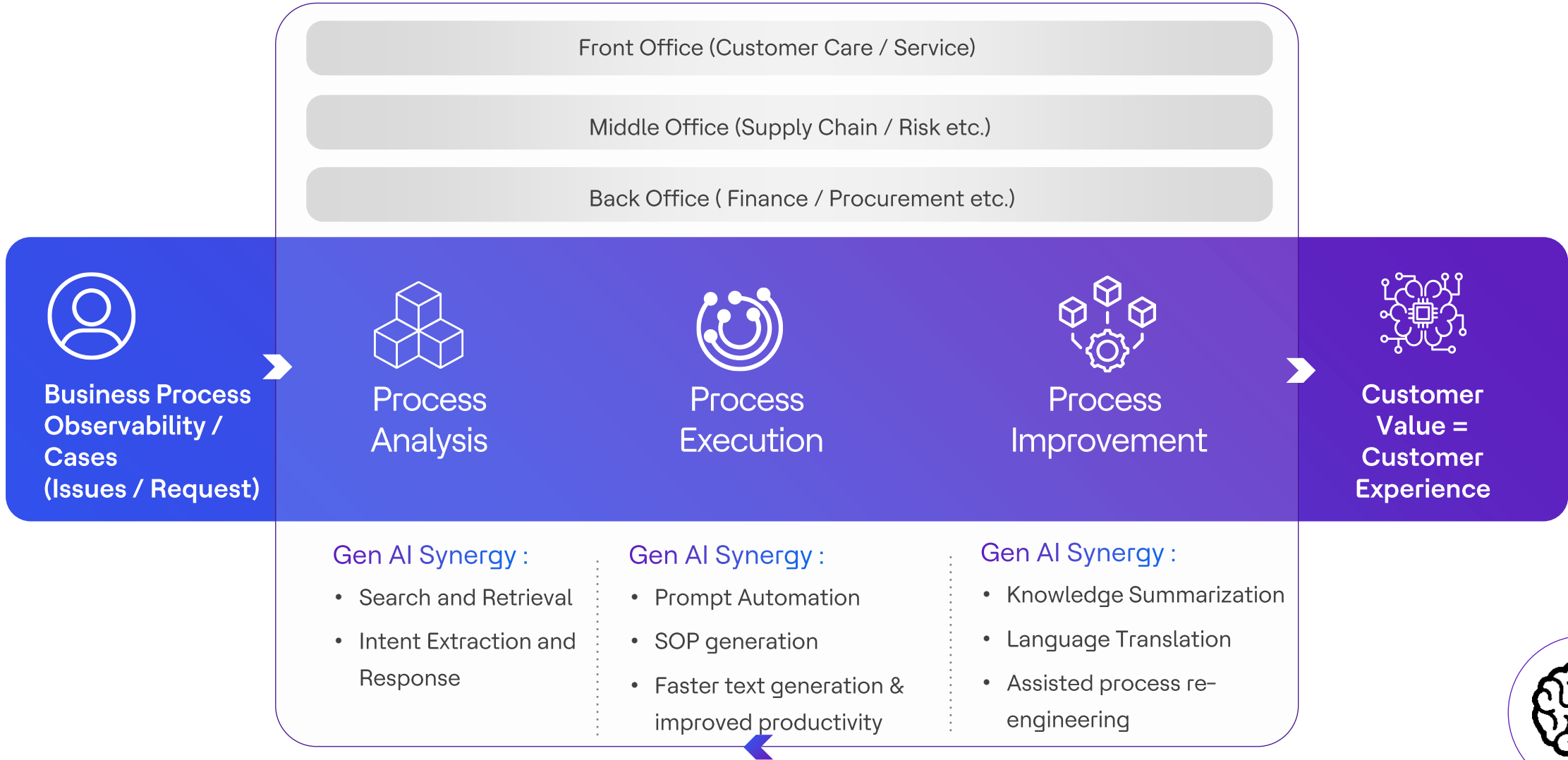


Synthetic Voice

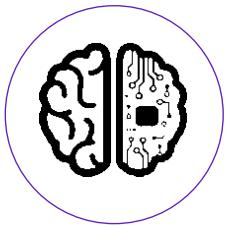


Speech Recognition

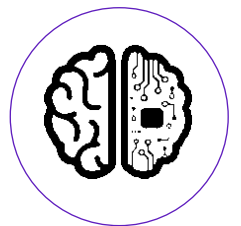
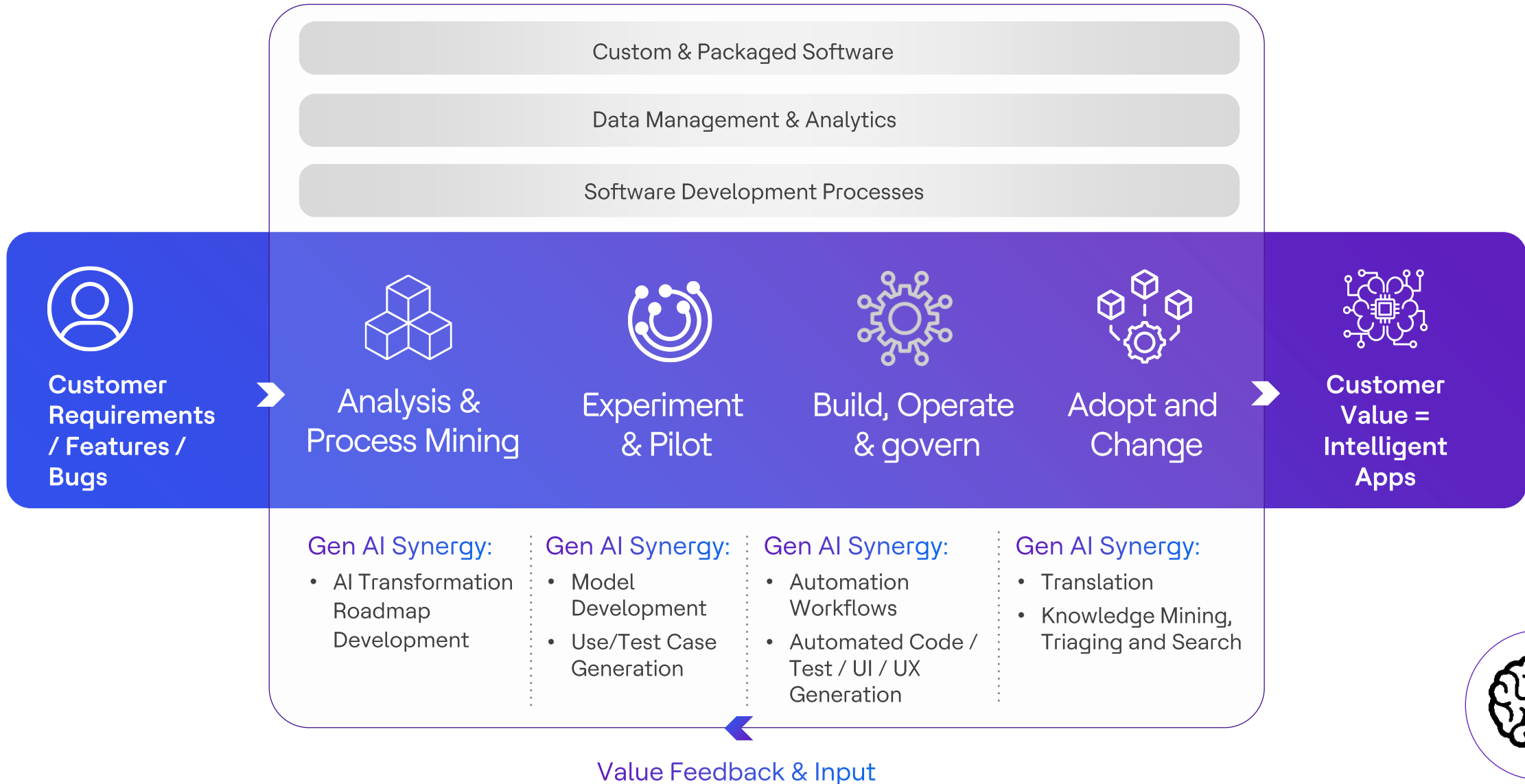
# Value Stream for Business Process Operations



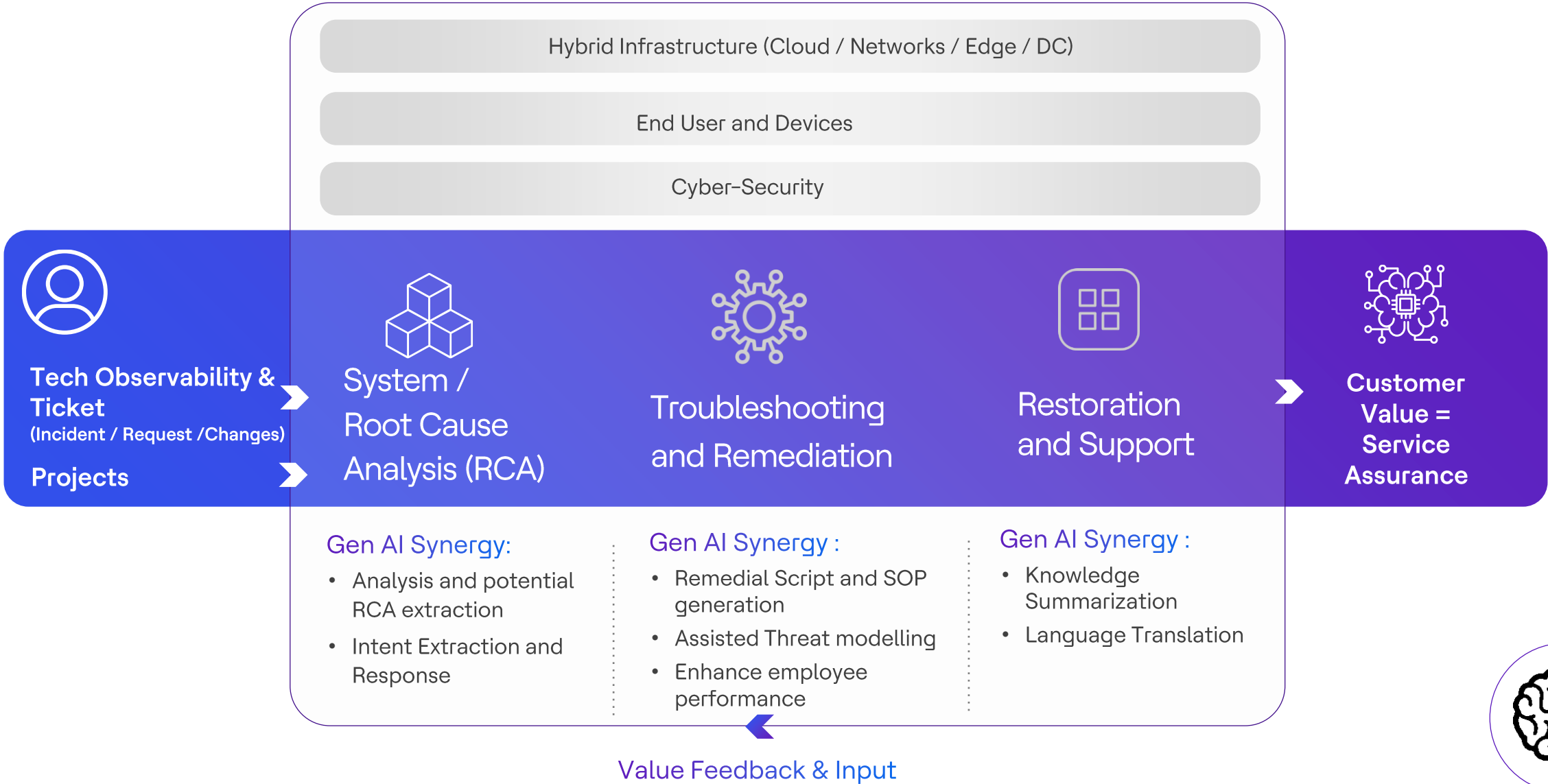
Value Feedback & Input



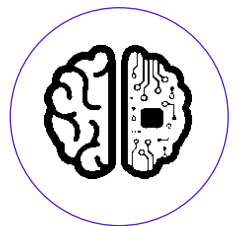
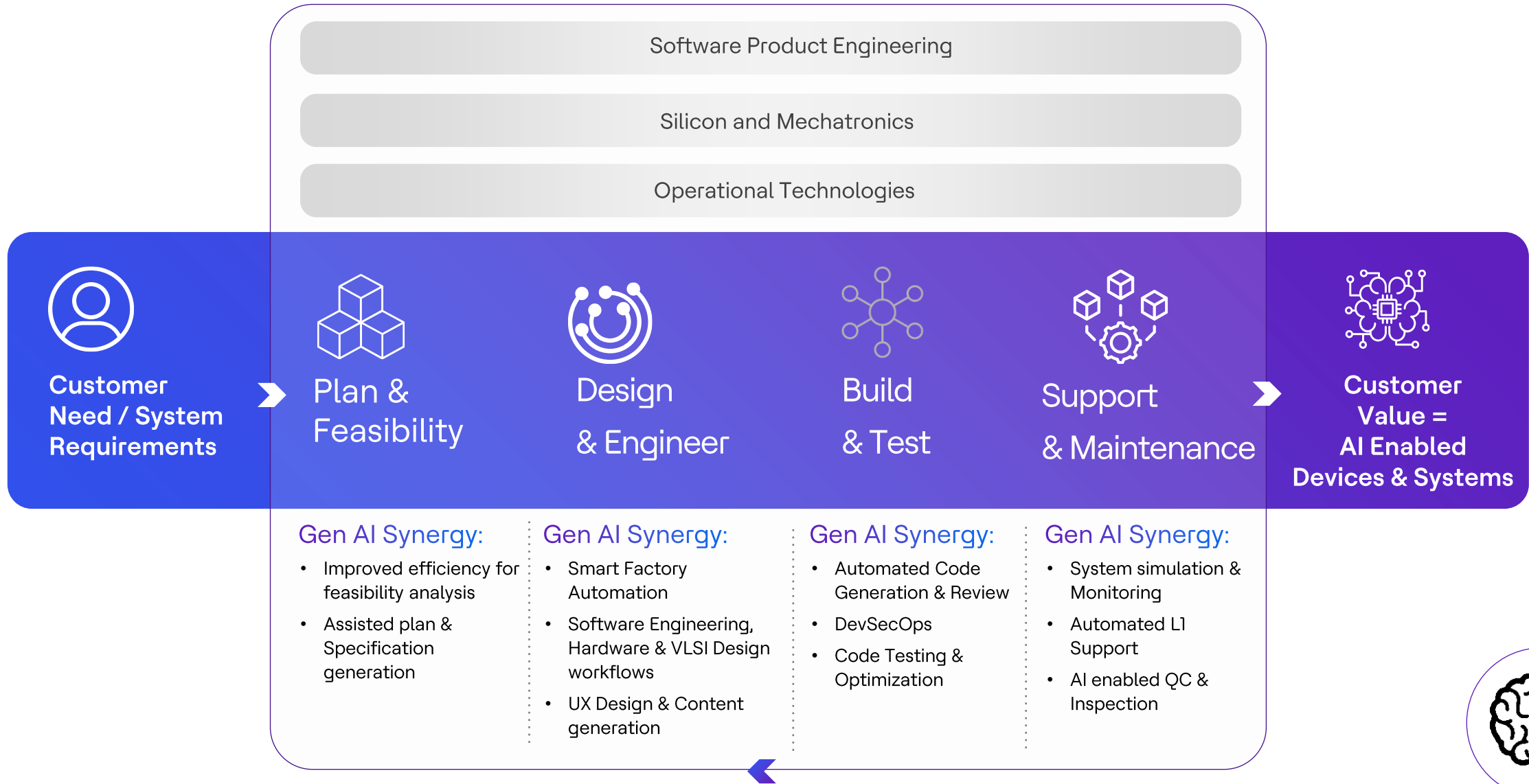
# Value Stream for Application Development and Support



# Value Stream for Infrastructure & Operations

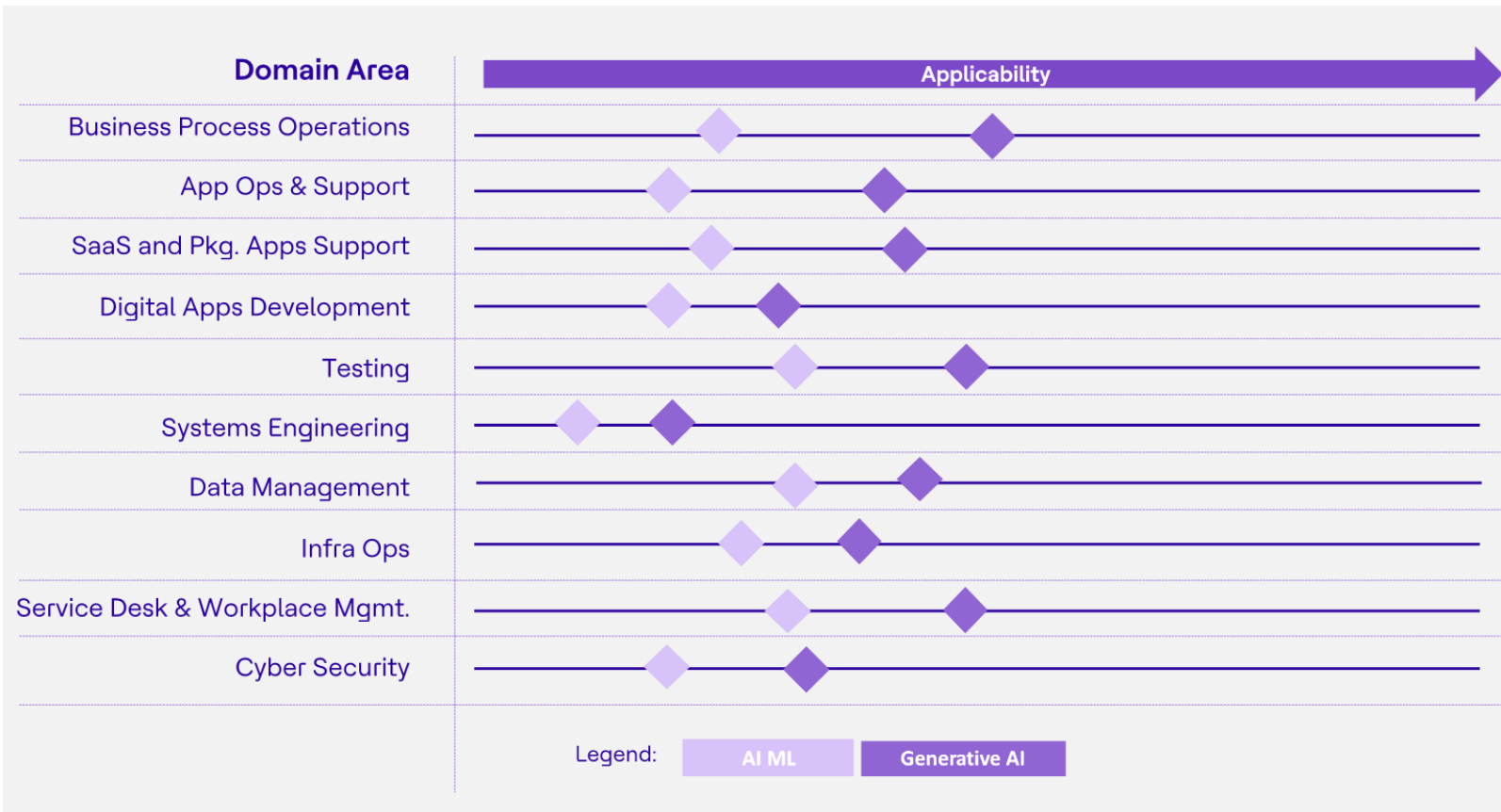


# Value Stream for Systems and Product Engineering



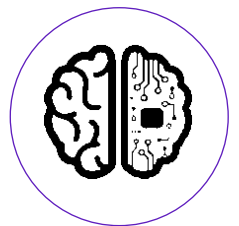


# Anticipated Applicability across various IT Service activities



Dependencies	Risks
<ul style="list-style-type: none"> <li>• Experience in using LLM models / GenAI skills</li> <li>• Functional or Operational Complexity</li> <li>• LLM Model Maturity</li> <li>• Quality of Model training data</li> <li>• Output Veracity and Changes required for use</li> </ul>	<ul style="list-style-type: none"> <li>• Data privacy &amp; copyright issues</li> <li>• Uncertainty and explainability bias</li> <li>• Costly production outages</li> <li>• Usage of Deepfakes</li> <li>• Accidental usage of sensitive data</li> <li>• Data explosion and costs</li> </ul>

Adoption in Enterprises will mirror Cloud Journey and the FinOps discipline to govern consumption will become extremely crucial.



# AI Philosophy @HCLTech

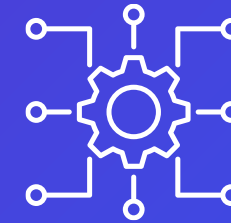


Create  
Infuse  
Embed  
Integrate

AI



From  
**Silicon**  
to  
Infrastructure,  
Apps, Data &  
Business Processes



To  
**supercharge**  
customers journey to  
a Generative  
Enterprise



## AI Services Span

- Noesis AI Framework
- Generative AI Services
- Annotation and Labelling Services
- Trustworthy AI Services
- Embedded and Edge AI Services
- AI Model as a Service
- Data Analytics and Engineering Services
- Machine Learning Operations
- AI Professional Services
- AI Edge Innovation

## AI Ecosystems Span

<b>AI Infrastructure Ecosystem</b> Cloud / Compute / Data	<b>AI Modeling Ecosystem</b> AI Foundation Modeling	<b>AI Edge Innovation Ecosystem</b> AI Open Innovation
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## Ecosystem Tenants & Impact

<p><b>Hardware / Chip Accelerators</b></p>   <ul style="list-style-type: none"> <li>• AWS</li> <li>• Microsoft</li> </ul>	<p><b>Upstream Modeling</b></p> <ul style="list-style-type: none"> <li>• Google ML</li> <li>• MS Azure Labs</li> <li>• AWS ML</li> <li>• IBM Watson</li> </ul>	<p><b>Open Innovation Ecosystem</b></p> <p><b>20+</b> VC &amp; Trade Mission Partners</p> <p><b>AI Champs</b> 50+ Incubation Solutions (including Startup partners)</p> <p><b>350+</b> Startup Partners</p>
<p><b>Cloud HyperScalers</b></p> <ul style="list-style-type: none"> <li>• Google Cloud</li> <li>• Microsoft Azure</li> <li>• AWS</li> </ul>	<p><b>Downstream Fine tuning</b></p> <ul style="list-style-type: none"> <li>• OpenAI</li> <li>• Google BERT</li> <li>• Google LaMDA</li> <li>• H2O.ai</li> </ul>	

# Potential Services Opportunities in GenAI



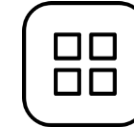
## Prompt Engineering

Testing and refining prompts to optimize them for specific tasks, using techniques such as prompt tuning, blending, and synthesis.



## Data Engineering

- Creation and Capture
- Gen AI driven Engineering
- Gen AI driven Insights



## Integration and Orchestration of Intelligent Apps

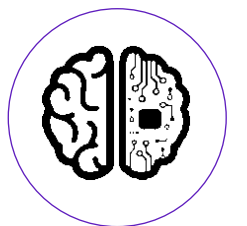
Orchestration across NLP, Generative AI Systems, knowledge Systems for Text, Image, Video, Audio



## Responsible AI

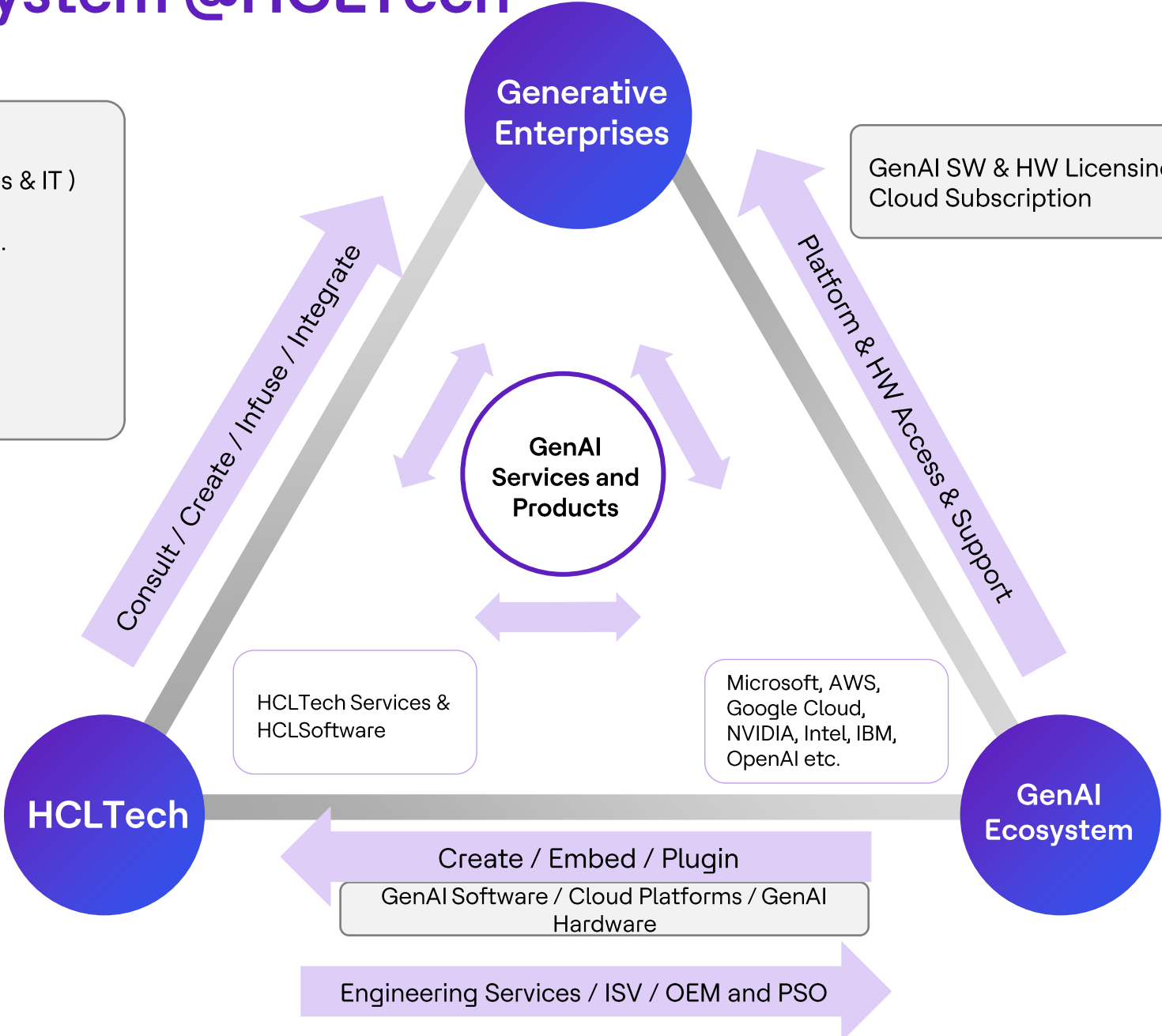
An AI system that enables:  
Privacy and Security

- Inclusion
- Fairness
- Traceability
- Accountability
- Trustability Of Results
- Reliability
- Change Management



# GenAI Ecosystem @HCLTech

- GenAI Services
  - Ops (Business Processes & IT)
  - Dev & Support
  - System & Product Engg.
  - GenAI Lab
- GenAI Products
  - Products
  - Cloud / XaaS



GenAI SW & HW Licensing & Cloud Subscription

HCLTech Services & HCLSoftware

Microsoft, AWS, Google Cloud, NVIDIA, Intel, IBM, OpenAI etc.

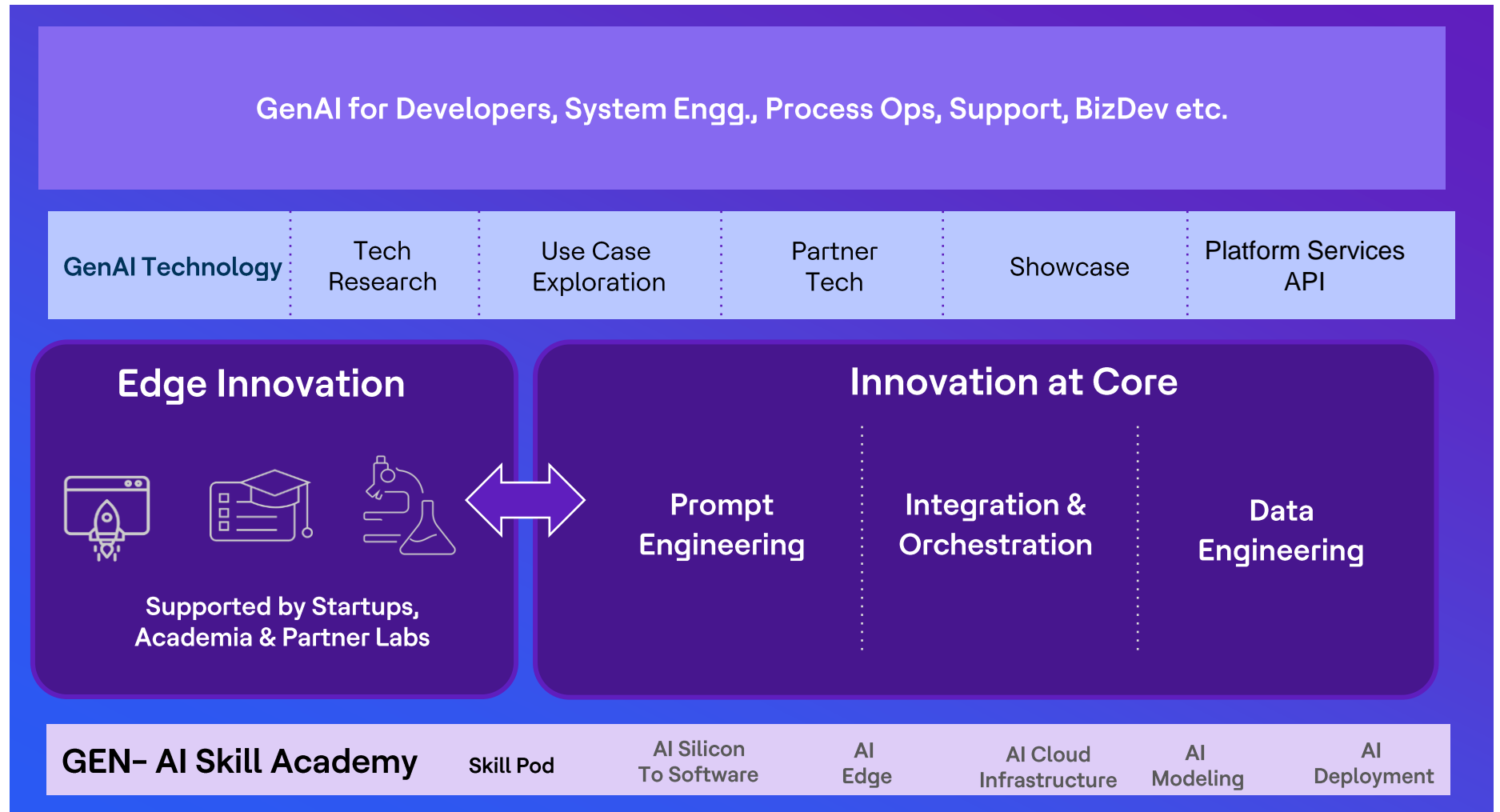
## Key Ecosystem Partnerships



What GenAI Lab does

- 1 Offering
- 2 Incubation Engine
- 3 Ecosystem Innovation
- 4 Skill Engineering

GenAI Lab supports teams in building solutions and services



# GenAI Case Study 1 – Patient Query Understanding



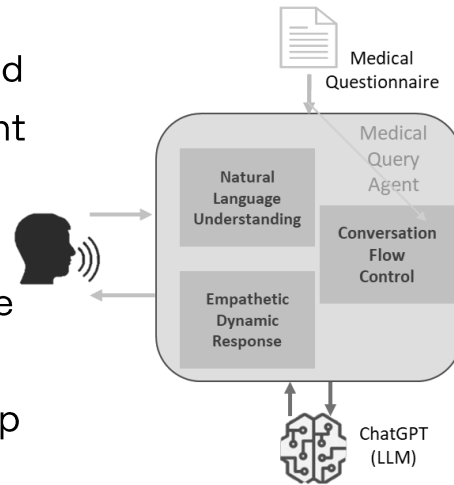
## Human Like Conversation Agent

### Business Objective

To develop a LLM powered Medical Conversational Agent to generate tailored response for patient's query, save healthcare worker times and prepare a condensed summary for physician to facilitate swift and efficient treatment.

### Technical Solution

- Identify the pre-medical questions to be asked
- Use ChatGPT to build the conversational agent
- Generating text based on given context or condition (Conditional prompting) the agent determine the patient's answers and fill up the relevant fields in a form
- Summarize the conversation for better look up by health associates



# GenAI Case Study 2 – Sales Bot



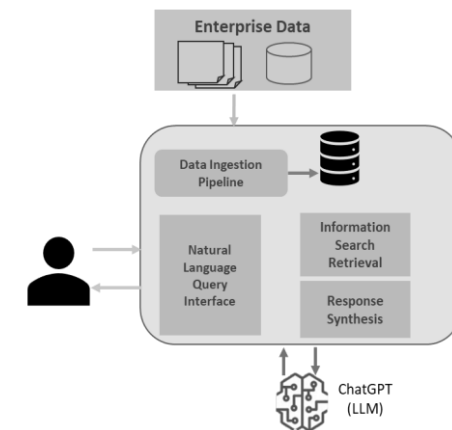
## Retrieval Augmented Generation (RAG)

### Business Objective

To develop a LLM powered Question Answering system that ingests sales data from different verticals and answers to user specific questions to help understand sales related activities

### Technical Solution

- Data Ingestion pipeline to extract data from sources into vector DB.
- Creating Q&A agent which have access to custom tools
- Retrieves semantically similar documents based on the question.
- Similar documents are stuffed to LLM along with the question to ask for extracting the answer.



# Key Take Aways

HCLTech with its engineering heritage has been involved in co-creating AI Technology stack for last 2 decades

We have deployed at scale AIOps in our operations and engineering business for over a decade and have carved those IPs to fuel the intelligent automation (DRYiCE) product line in HCLSoftware

We have been implementing AI solutions with over 150+ use cases across our clients in our Digital Services

We are an early adopter of GenAI technologies as a customer  
(Microsoft / OpenAI Co-Pilot at HCLTech and Google DuetAI & GITHUB Co-Pilot at HCLSoftware)

We are in the launch partner program for all the major hyperscalers on their GenAI stack

We have a GenAI labs which is leading all our efforts in this space



# HCLSoftware

## Generative AI@HCLSoftware

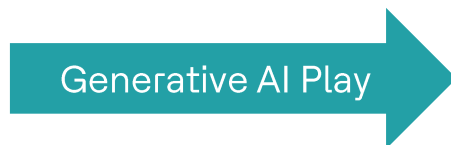
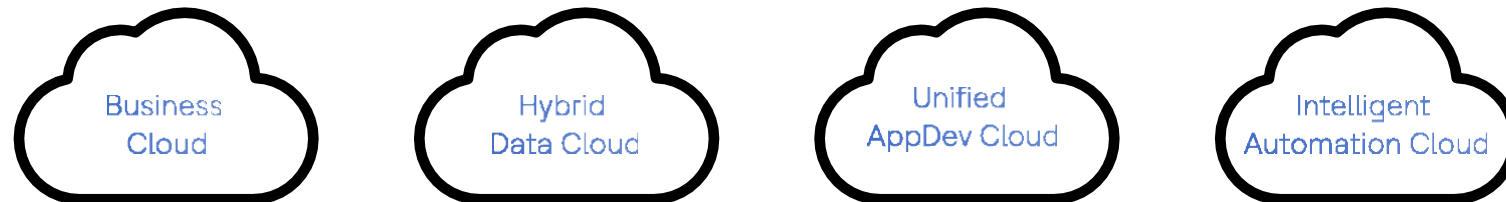
Kalyan Kumar (KK)  
CPO, HCLSoftware  
Twitter: @kklive

# HCLSoftware Cloud Strategy

Move to Industry Oriented Clouds



## Unified Access Layer



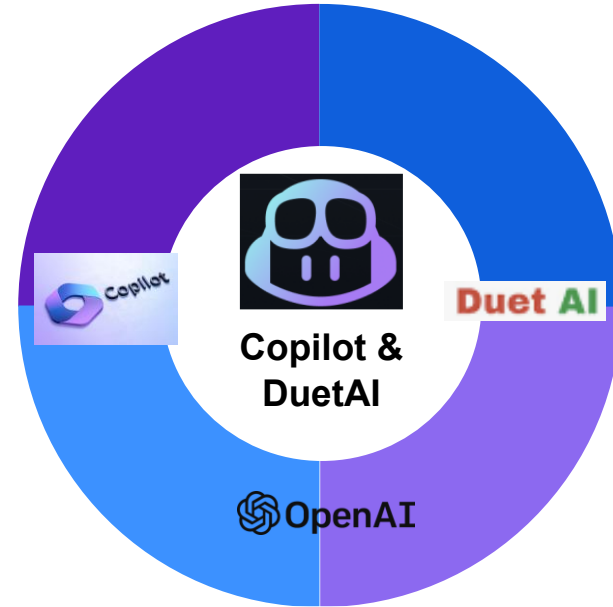
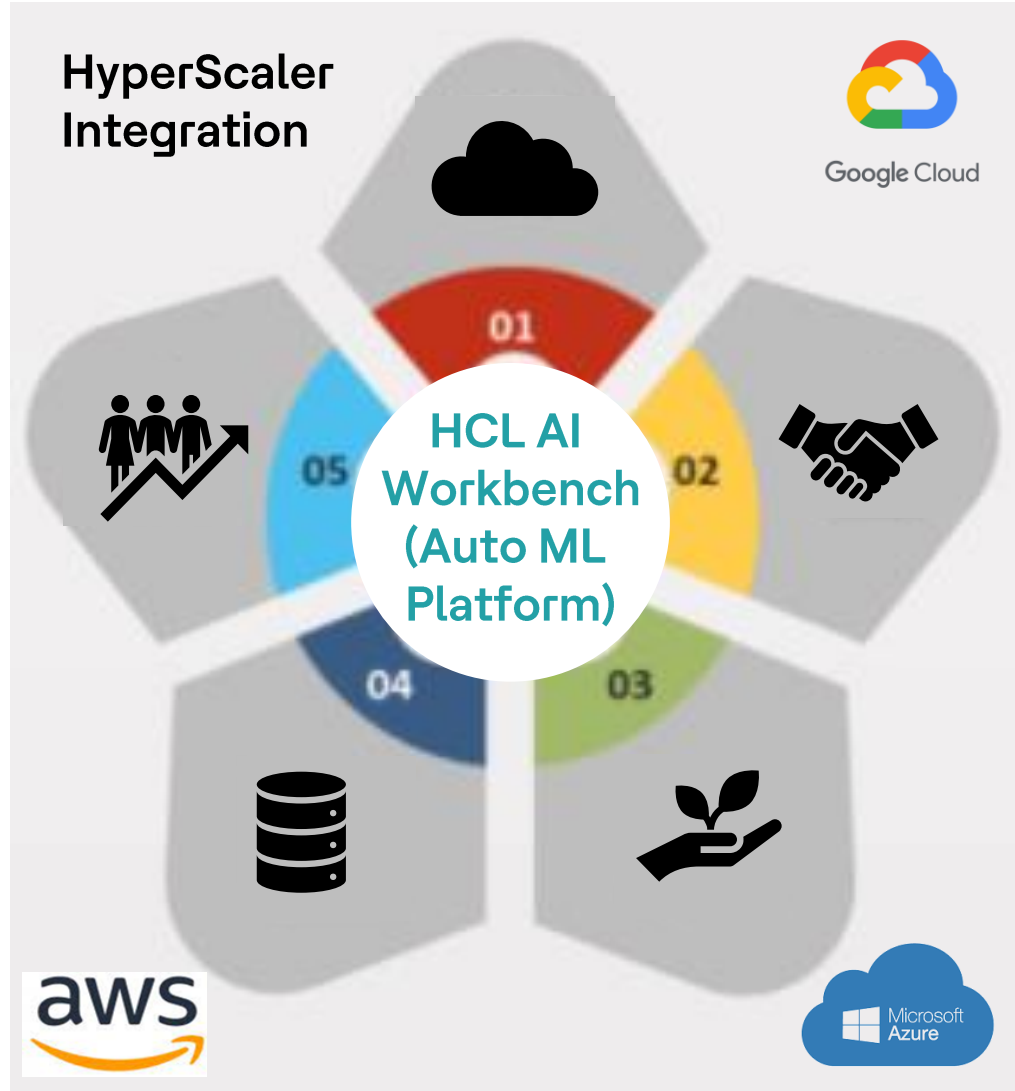
AI/ML/NLP/Cognitive Services/GenAI

Ubiquitous Distributed Cloud Ecosystem (Public/Sovereign/Edge/Telco/Private)

# AI Philosophy @HCLSoftware



# Create: Generative AI in partnerships with Hyperscalers



## Pair Programmer :

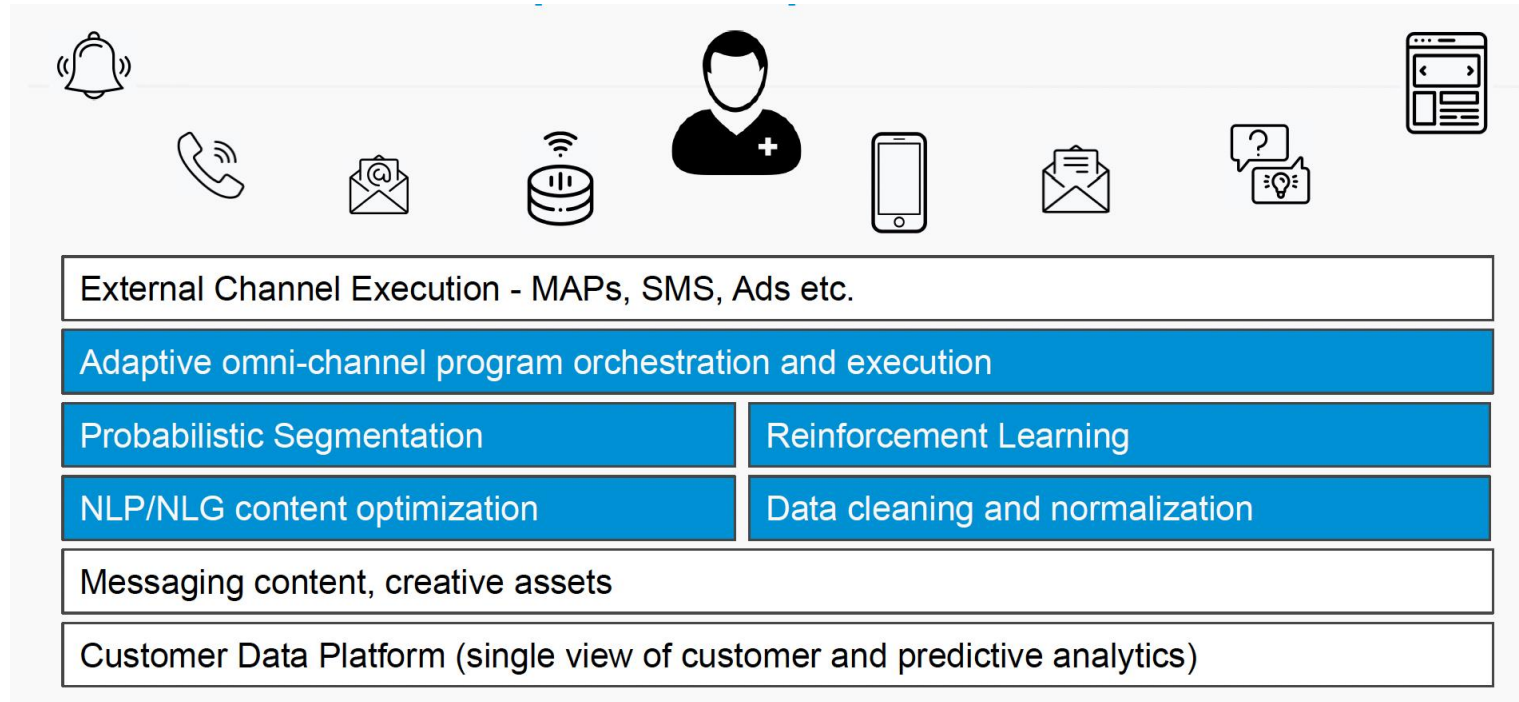
- Code generations
- Test case generation
- Multi programming language and IDE support
- GenAI driving Product Velocity



## ChatGPT Like experience :

- Chat interface for Developers for Interaction
- Code explanations and Doc generation
- Unit test and code generation
- Bug Fixes

# Embed: Generative AI



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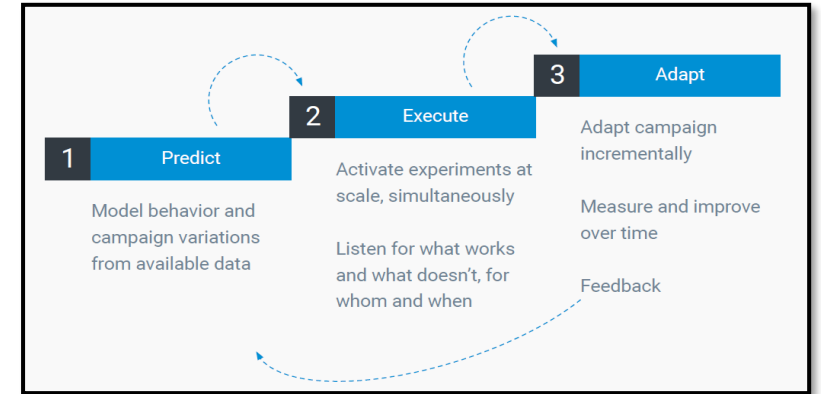
HCLSoftware

Powered By



Partner Ecosystem

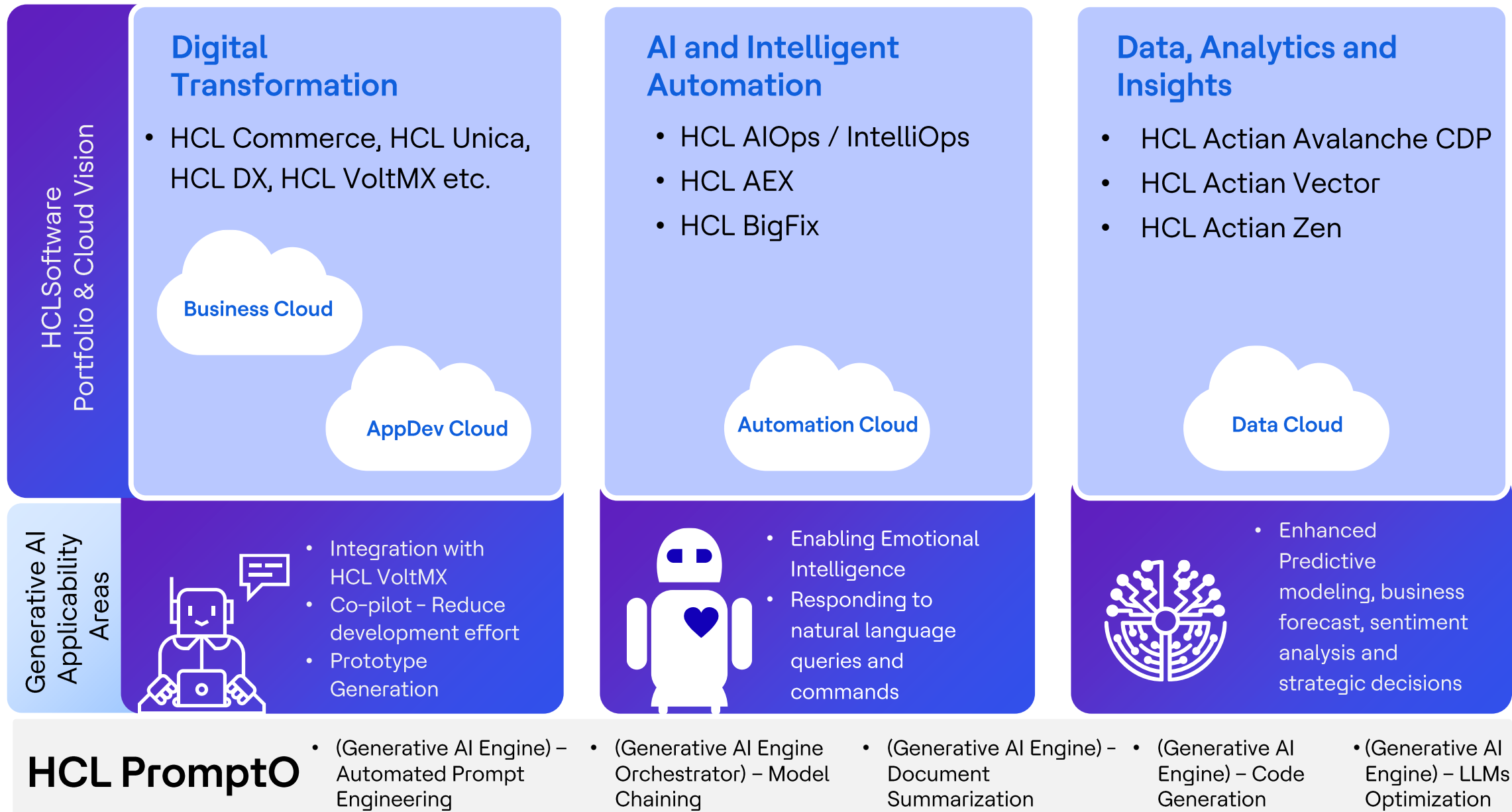
## Reinforcement Learning of the partner platform



[https://drive.google.com/file/d/1m5yzGHQpLXvFDpZC\\_03UvtlsiqU8ZZ3s/view?usp=drivesdk](https://drive.google.com/file/d/1m5yzGHQpLXvFDpZC_03UvtlsiqU8ZZ3s/view?usp=drivesdk)

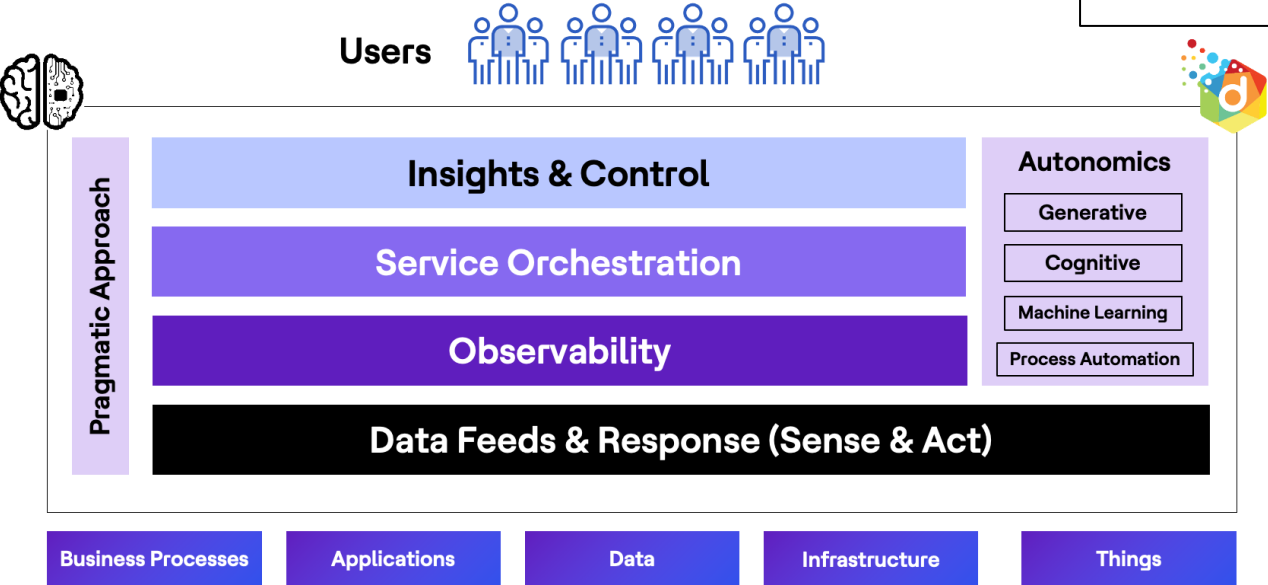
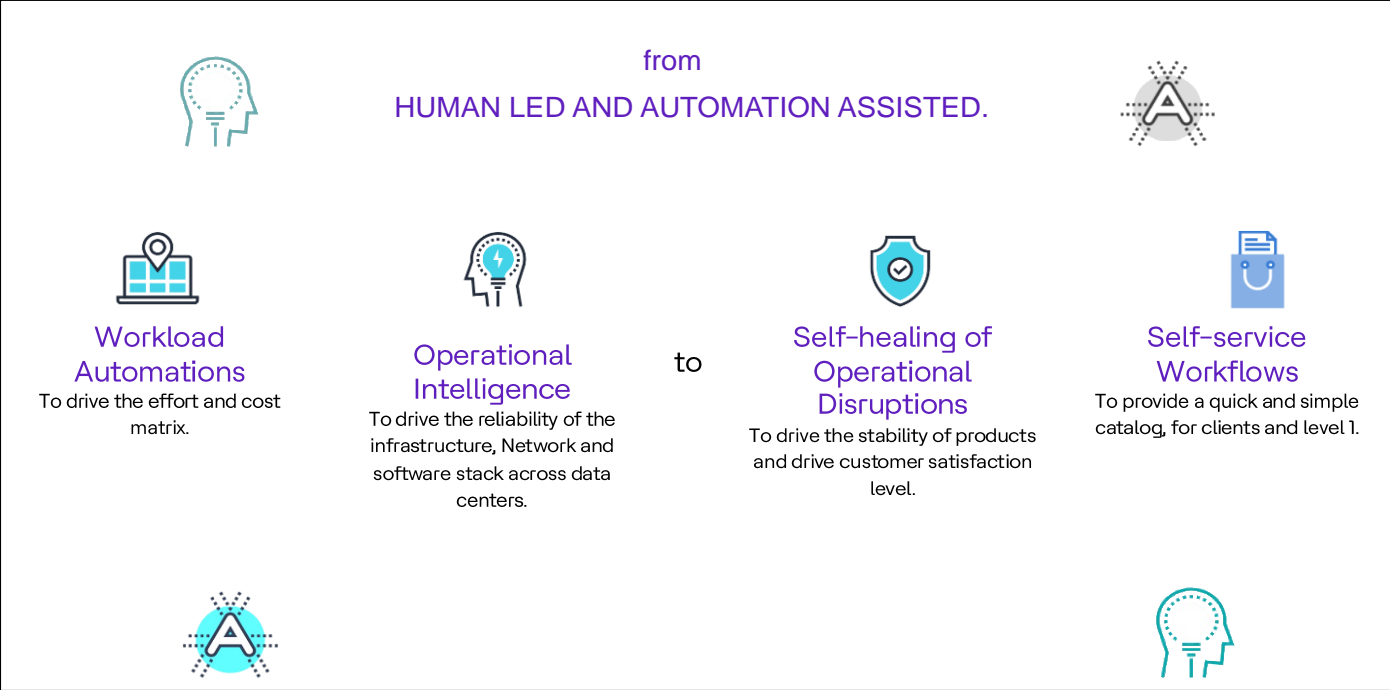
A very simple effective use of GenAI to manage email campaign in Unica...

# Plugin: Infuse and Leverage Generative AI



# Infusing GenAI into Intelligent Automation Cloud

Value creation via XaaS / MSP



Outcome based Subscription Licensing

# Thank You