Building AI-Driven Products

A strategic & practical blueprint for Innovation Leaders

Nitish Gupta, PhD
Head of Business (Knowledge Exchange and Enterprise)
University of Southampton Delhi, India
n.gupta@soton.ac.uk

Agenda

- Introduction
- Artificial Intelligence (AI) & Product Management
- A morphological framework for AI-driven product features
- Call for collaboration & discussion

Introduction

- PhD in Engineering from University of Cambridge, holds MBA and Computer Science Engineering degrees from India.
- Worked as Global Product Leader with IPC Systems, Buhler Group, London Medical Lab, Tata, Merck in the US, UK, Germany, Japan and India.
- Currently working as Associate Professor in Business Management & Head of Business (Knowledge Exchange and Enterprise) at University of Southampton Delhi, India.
- Research and consulting interests: strategy, innovation, portfolio management, new product development, artificial intelligence, and project management

Dilemma & negotiations between Product and Engineering

"Requirements are not quite clear"

"You need to decide on trade-offs"

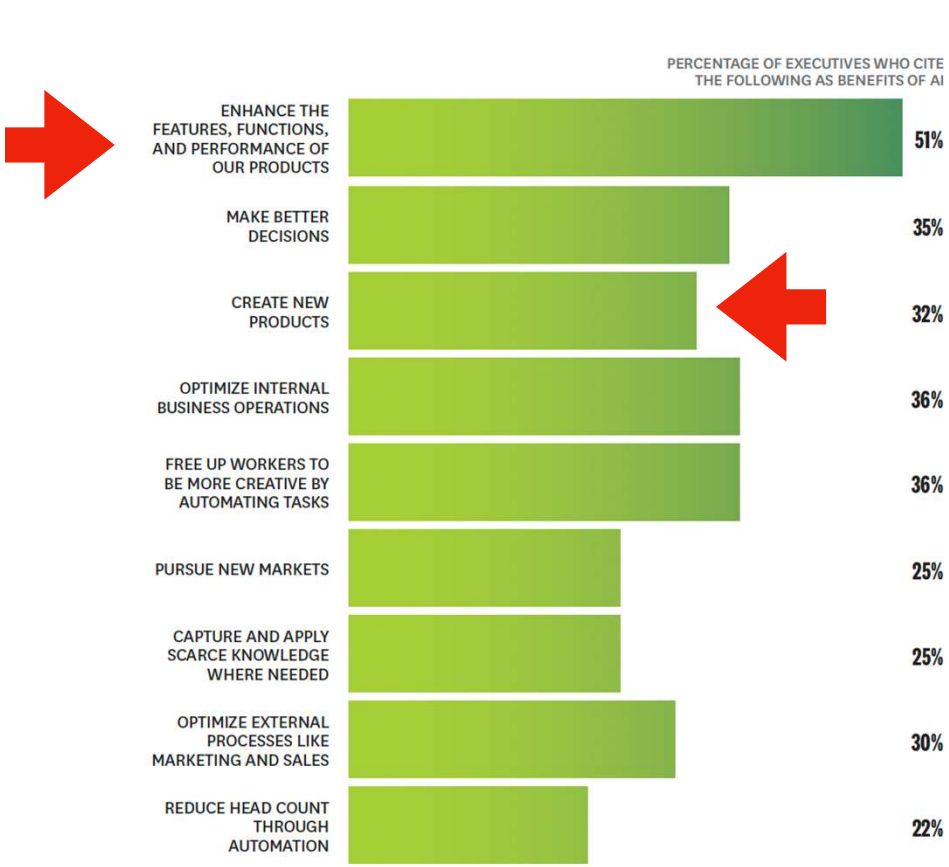
"This sprint is for technical debt"

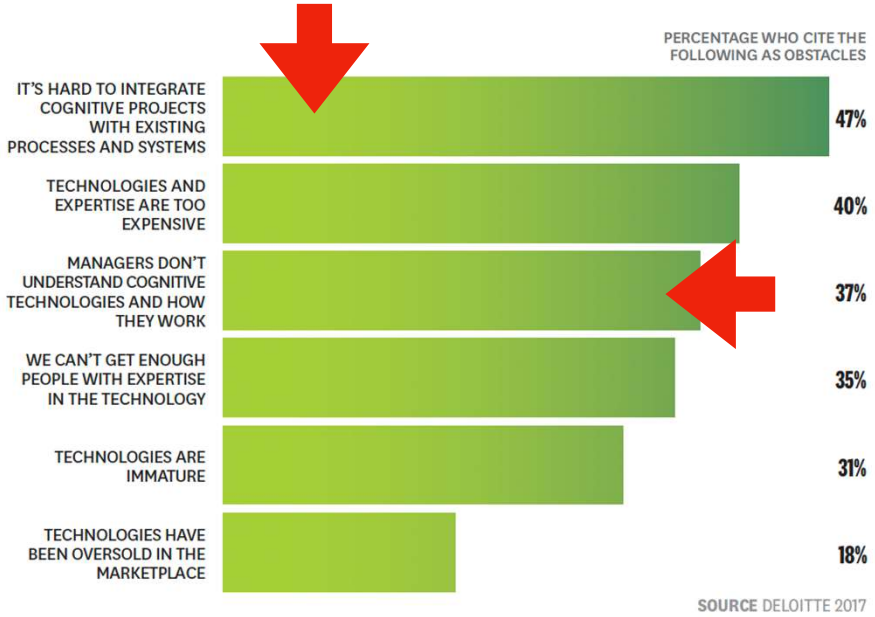
"Are you introducing any new product"

Has this changed with AI?

Image generated using AI

Artificial Intelligence in Real World





Davenport & Ronanki (2018)

AI and Product Management

What does AI add to conventional product management?

- Multimodal Data
- Model Training
- Context-Aware
- .....

Adapted from Olsson & Bosch (2024). Graphic generated by AI

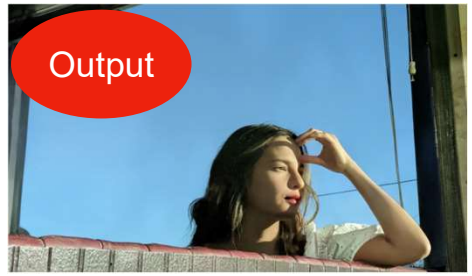
Strategic Innovation: Functionality to Portfolio

Feature	Product	Product Portfolio
Functionality 1	Feature 1	Product 1
Functionality 2	Feature 2	Product 2
Functionality 3	Feature 3	Product 3

Camera	Smart Phone	Portfolio
Click Photo	Camera	Smart Phone
Edit Photo	Connectivity	Smart Watch
Record Video	Maps	Laptop

Photos from google.com

As a product manager



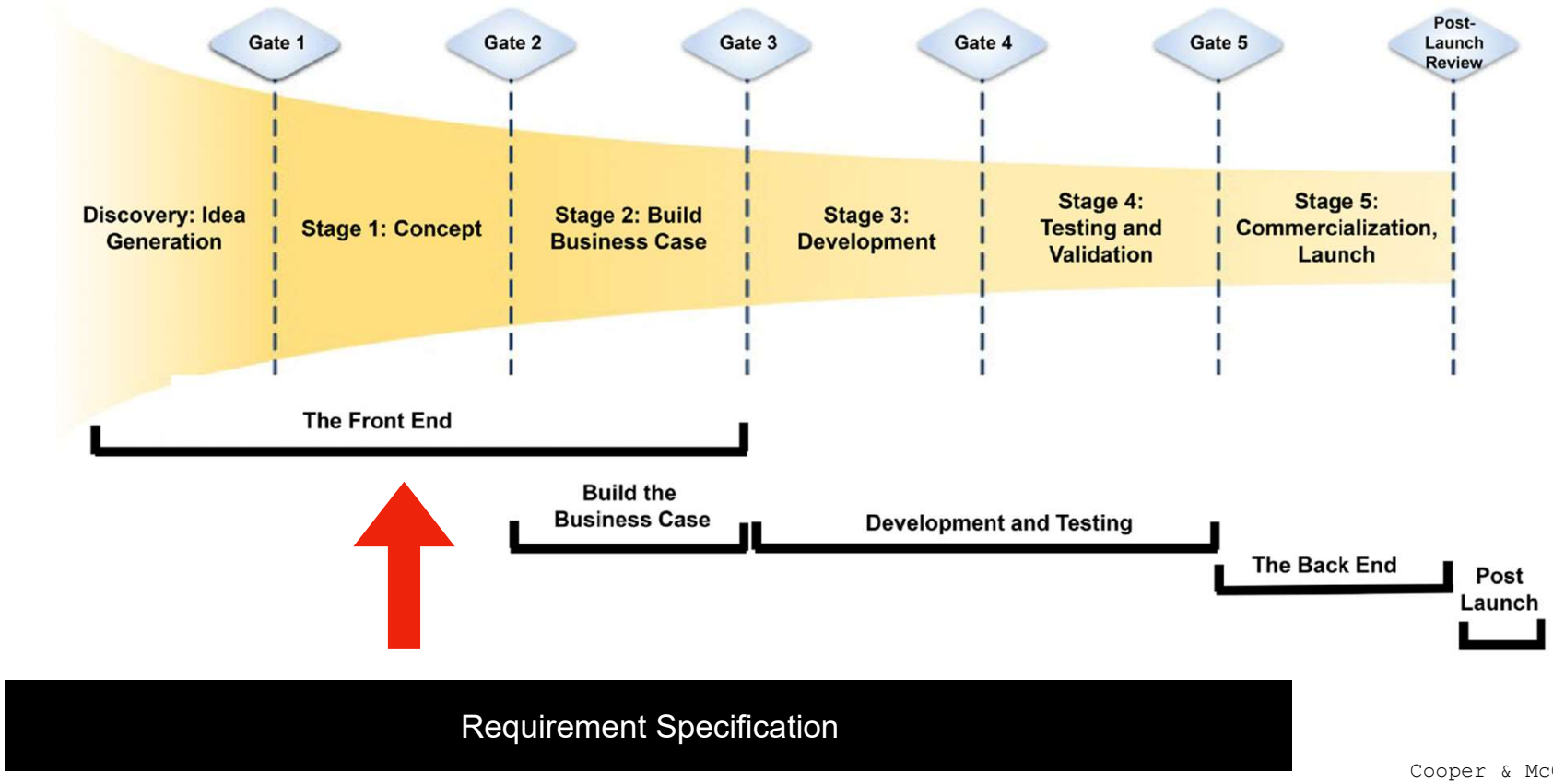
How would you design this AI-driven product feature?

Is traditional Product Requirement Document (PRD) sufficient for cross-functional negotiations?

How would you communicate your idea with key details and trade-offs?

Photos from google.com

AI and New Product Development Process



Cooper & McCausland (2024)

A morphological framework for AI-driven Product

Methodology:

- Structured literature review of peer-reviewed articles on AI and Product Management in Web of Science
- 10 exploratory interviews & 1 workshop with AI Product Managers to understand design of AI features
- In-depth case studies on AI-driven products and round table discussions with product innovation leaders**.**

Work in progress:

- A comprehensive framework to understand depth and breadth of AI-driven product feature requirements
- Strategic planning templates for designing & visualising AI-driven product features cross-functionally

A morphological framework for AI-driven Product

Benefit	Automation	Engagement	Insights

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	**Forecasting**	**Pattern Recognition**	**Decision-Making**	**Generative**	**Personalization**	**Recommendation**	**Anomaly or Error**

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	**Frequency**			**Trigger**		**Type**	

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	**Functionality**	**Feature**		**User**	**Open Data**	**Type**	**Source**

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	**Supervised**	**Unsupervised**		**Generative**	**Reinforced**	**Deep Learning**	

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	Supervised	Unsupervised		Generative	Reinforced	Deep Learning	
Knowledge	**Structural**		**Teleological**		**Functional**	**Behavioural**	

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	Supervised	Unsupervised		Generative	Reinforced	Deep Learning	
Knowledge	Structural		Teleological		Functional		Behavioural
Context	**Intent**		**Memory**		**Preferences**		**Environment**

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	Supervised	Unsupervised		Generative	Reinforced	Deep Learning	
Knowledge	Structural		Teleological		Functional		Behavioural
Context	Intent		Memory		Preferences		Environment
Computing	**Cloud**		**Edge**		**Device**		**Hybrid**

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	Supervised	Unsupervised		Generative	Reinforced	Deep Learning	
Knowledge	Structural		Teleological		Functional		Behavioural
Context	Intent		Memory		Preferences		Environment
Computing	Cloud		Edge		Device		Hybrid
Evaluation	**Explainability**	**Bias**		**Robustness**	**Privacy**	**Reliability**	**Accuracy**

A morphological framework for AI-driven Product

Benefit	Automation		Engagement		Insights		
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency		Trigger		Type		
Data	Functionality	Feature	User	Open Data	Type	Source	
Model	Supervised	Unsupervised	Generative	Reinforced	Deep Learning		
Knowledge	Structural	Teleological	Functional	Behavioural			
Context	Intent	Memory	Preferences	Environment			
Computing	Cloud	Edge	Device	Hybrid			
Evaluation	Explainability	Bias	Robustness	Privacy	Reliability	Accuracy	
Adjustment	**Fine-tune**		**RAG**		**Grounding**		

A morphological framework for AI-driven Product

Benefit	Automation			Engagement		Insights	
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency			Trigger		Type	
Data	Functionality	Feature		User	Open Data	Type	Source
Model	Supervised	Unsupervised		Generative	Reinforced	Deep Learning	
Knowledge	Structural		Teleological		Functional		Behavioural
Context	Intent		Memory		Preferences		Environment
Computing	Cloud		Edge		Device		Hybrid
Evaluation	Explainability	Bias		Robustness	Privacy	Reliability	Accuracy
Adjustment	Fine-tune			RAG		Grounding	

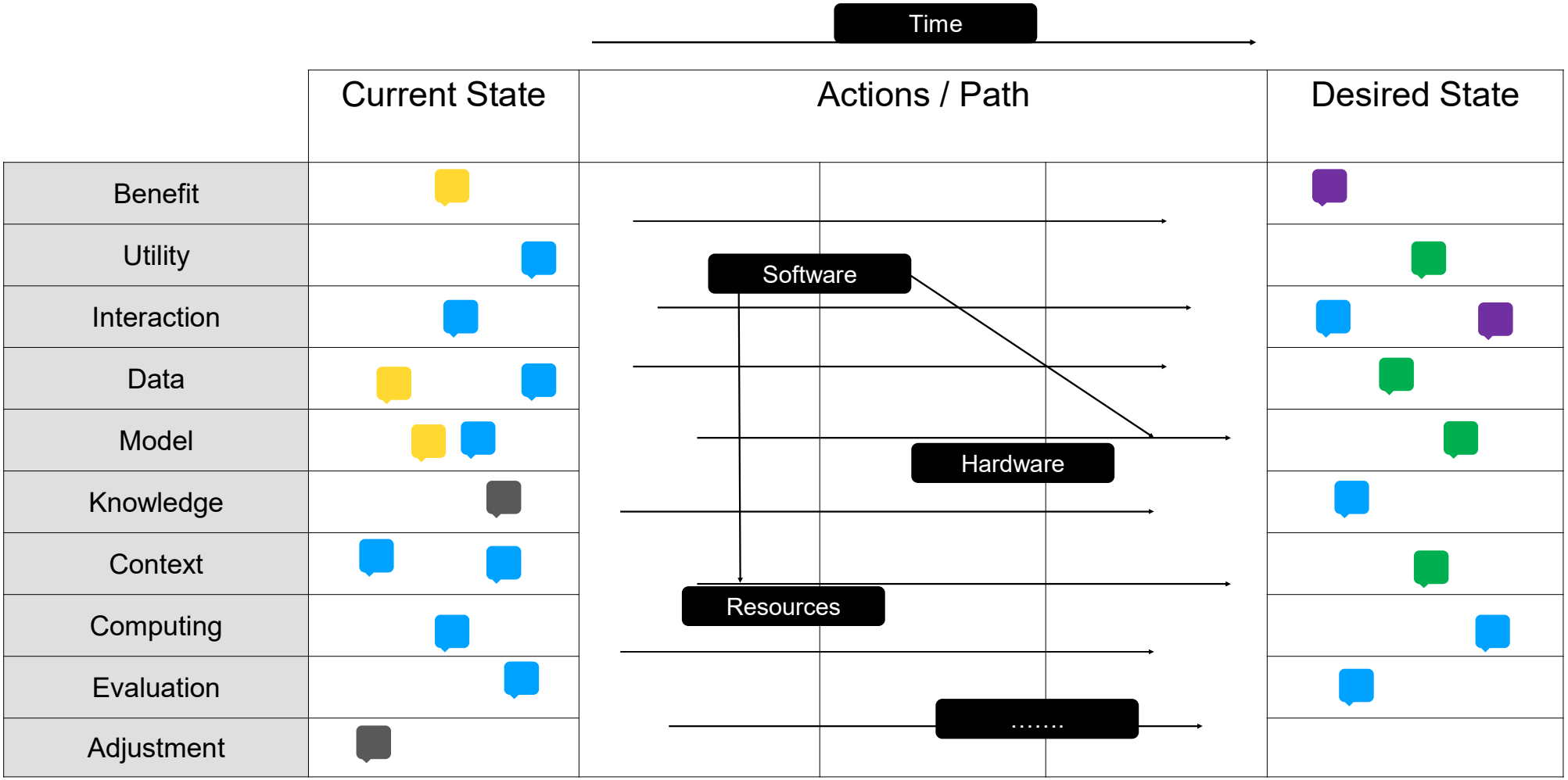
A morphological framework for AI-driven Product

Benefit	**Process Automation** (e.g. automating business processes)			**Cognitive Engagement** (e.g. using NLP for chatbots, agents)		**Cognitive Insights** (e.g. detect patterns in large volume of data)	
Utility	**Forecasting**	**Pattern Recognition**	**Decision-Making**	**Generative**	**Personalization**	**Recommendation**	**Anomaly or Error Detection**
Interaction	**Frequency** (real-time, hourly, daily, weekly)			**Trigger** (on-demand, time-based, threshold..)		**Type** (conversational, instruction, manipulating..)	
Data	**Functionality** (usage, feedback..)	**Feature** (Daily Active Users..)		**User** (usage, situation..)	**Open Data** (archive, govt..)	**Type** (Text, Voice, Video ..)	**Source** (internal, external)
Model	**Supervised** (pre-labelled data)	**Unsupervised** (un-labelled data)		**Generative** (Text, Voice, Video..)	**Reinforced** (feedback loop)	**Deep Learning** (complex data)	
Knowledge	**Structural** (interfaces, user..)		**Teleological** (goals and results)		**Functional** (sequence of activities & their activation)	**Behavioural** (reaction by user, objects, systems)	
Context	**Intent** (user goal, output from prompt)		**Memory** (agent, assist, short, long)		**Preferences** (from previous user sessions.)	**Environment** (user situation, real-time condition)	
Computing	**Cloud** (public, private, hybrid)		**Edge** (trade off cost vs latency)		**Device** (wearables, mobile..)	**Hybrid** (connectivity, network factors)	
Evaluation	**Explainability** (logs, summaries)	**Bias** (data, algorithm..)	**Robustness** (generalization, data diversity..)		**Privacy** (data, user..)	**Reliability** (data quality..)	**Accuracy** (positives & negatives)
Adjustment	**Fine-tune** (retrained on task, domain specific data..)			**RAG** (use of relevant documents, data, information)		**Grounding** (context learning, influence response)	

AI Product Feature Canvas

Benefit	Automation		Engagement		Insights		
Utility	Forecasting	Pattern Recognition	Decision-Making	Generative	Personalization	Recommendation	Anomaly or Error
Interaction	Frequency		Trigger		Type		
Data	Functionality	Feature	User	Open Data	Type	Source	
Model	Supervised	Unsupervised	Generative	Reinforced	Deep Learning		
Knowledge	Structural	Teleological	Functional	Behavioural			
Context	Intent	Memory	Preferences	Environment			
Computing	Cloud	Edge	Device	Hybrid			
Evaluation	Explainability	Bias	Robustness	Privacy	Reliability	Accuracy	
Adjustment	Fine-tune		RAG		Grounding		

AI Product Feature Roadmap



Call for collaboration & discussion

Use this as a strategic planning tool: **Product Feature Canvas**

Use this as a strategic roadmapping tool: **Product Feature Roadmap**

Use this as a portfolio tool: **Visualise, communicate, assess AI readiness of product portfolio**

- What is your firm's approach towards development of AI-driven products or services?
- What challenges do you see in the development of such features, and what type of decisions are taken?
- Which strategic planning tools and processes you use for product management & alignment?

Please get in touch:

Nitish Gupta

n.Gupta@soton.ac.uk