

# Fujitsu World Tour 2018

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shaping tomorrow with you



#FujitsuWorldTour

## Human Centric Innovation Co-creation for Success

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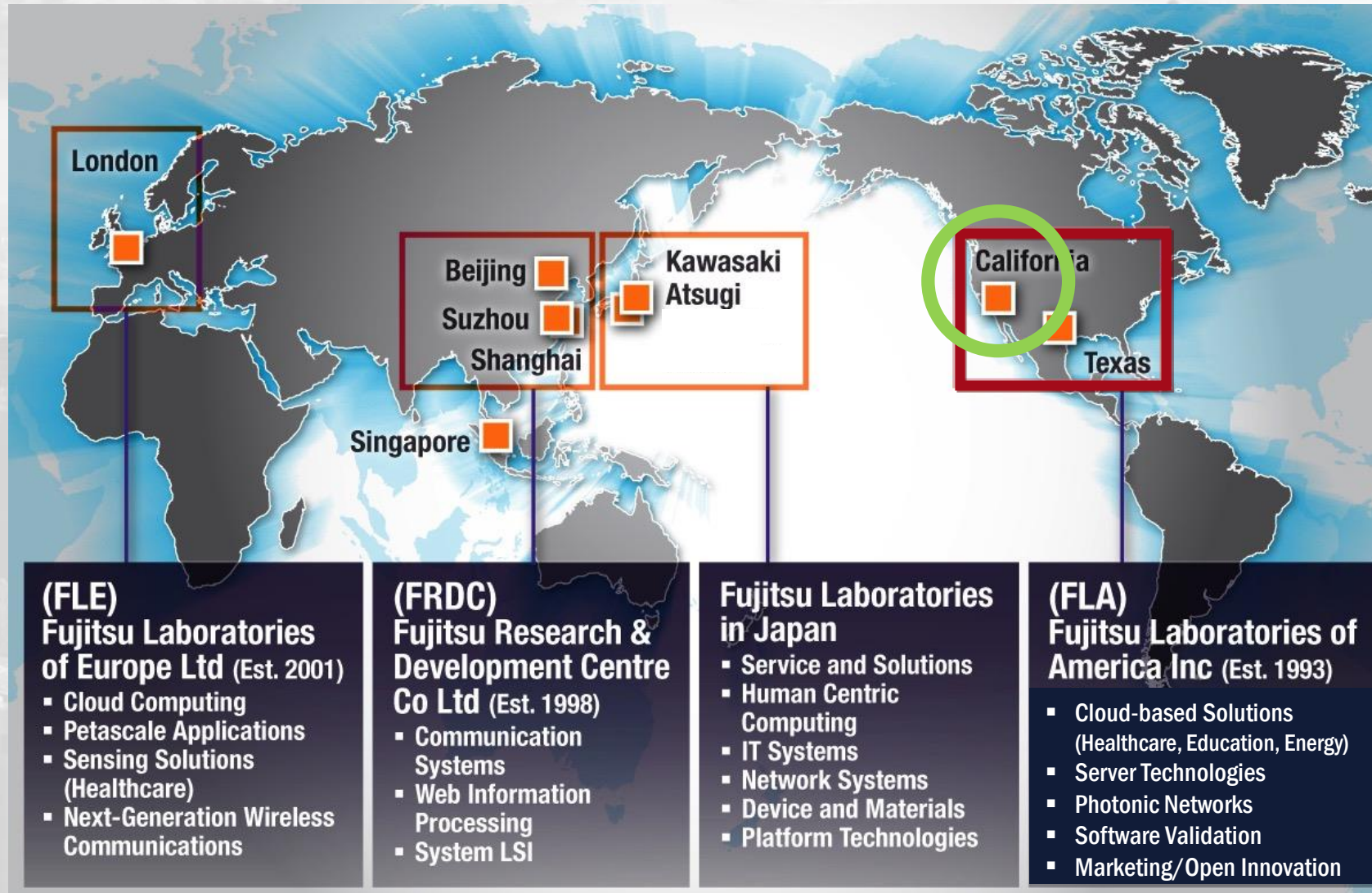


# Transparent AI for the Enterprise

Ajay Chander

Director, Digital Life Lab  
Fujitsu Labs of America

# Fujitsu Global Laboratories



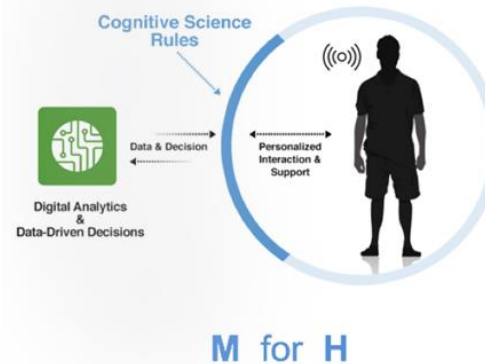


Enable humans and machines to collaborate in a digital world

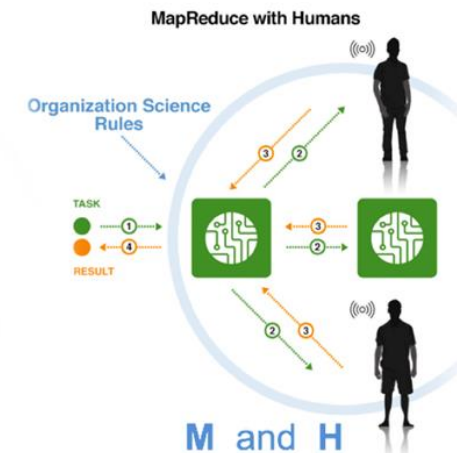
We focus on 'Human in the Loop' problems



Sensor Fusion,  
Health Analytics



AI Life Assistants



Transparent AI

# Humans and Businesses in a Digital World



Human <b>Sensing</b>	is being augmented by	IoT (digital sensors)
Human <b>Decision Making</b>	is being augmented by	AI
Human <b>Action</b>	is being augmented by	Robots (soft & hard)



Businesses are starting the transition from organizing as  
"Intelligences Apart" to "Intelligences Augmented"

**To succeed, businesses need their employees to co-create with AI**  
Human Decisions and Actions based on digital data and recommendations

Business customers expect AI that enables Human-AI Co-Creation

# AI Practice today: An example

The “Human-in-the-Loop” responsible for AI co-creation is an AI engineer  
Graduate-level coursework in AI

## Step 1: Collect Data

Split into training and test data

## Step 2: Construct AI Pipeline

Decide on data representations and AI models

## Step 3: Train & test AI pipeline using training & test data

Parametrize AI models in pipeline

## Step 4: Is AI pipeline performance acceptable on training data?

If not, AI model parameters updated (*heuristically at best*) to improve performance

Overall interaction between AI and AI Engineer as “Human-in-the-Loop”

Data → AI Pipeline → Train → Test using performance on training data → Deploy

Perspective bias

Data bias

Engineer bias

Just “make it work”

**Dark AI**

Dark AI is not suited for Human-AI Co-Creation

# Who is involved in building / using AI Services?



## AI Engineer

Builds the AI service **or** core AI models and APIs

## System Engineer

Builds the AI service via integration of APIs

## Business stakeholder

Designs and sells the AI service

## End-user

Uses the AI service

Now

Emerging

The Future



# Business Person & AI Co-Creation

## Step 1: Ask

Business person asks the trained AI model a question

## Step 2: Answer

AI gives an answer, *with an explanation*

## Step 3: Test against Human Beliefs

If the answer + explanation is consistent with the person's belief, we move on

## Step 4: Update AI or Update Beliefs

(Step 1) AI is asked a different question (possibly on other data)

Repeat until belief is updated OR AI is updated

## Overall interaction between AI and Business person as "human-in-the-loop"

Trained AI → Ask → Answer + explanation → Test against belief → Update belief or AI

## Extending Interactivity

Automatic recognition of usable parameters ("tuners") for customizing AI by end-users

### Transparent AI

Accessible AI

Explainable AI

Interactive AI

Tunable AI

Transparent AI enables Human-AI Co-Creation



# Transparent AI and the European Union GDPR

GDPR = General Data Protection Regulation, effective May 2018

	EUGDPR.org	The Regulation	The Process	Our Partners	
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The EU General Data Protection Regulation (GDPR) is the most important change in data privacy regulation in 20 years - we're here to make sure you're prepared.

“Right to explanation” allows a user to ask for an explanation of an algorithmic decision made about them

Unclear if legally binding requirement; debates ongoing

# Transparent AI for Sales Decision Support

#32



Business Stakeholder: Allison Dean, Head of Sales for a large global services unit  
Allison's goal: How do I increase overall win % on sales contracts?

Ask

Allison: What features impact total win %?

Answer

AI: Total contract price does, lower priced is better

Belief  
Test

Allison: Hmm. Churn contracts (i.e., contract renewals) are affecting the result. Let's remove them.

AI: Same result after removing churn contracts.

Interact

Allison: Really? I wonder why. Show me the data that matches these conditions *(AI-driven exploration)*

AI: Here's the data that matches those filters.

Update  
Belief

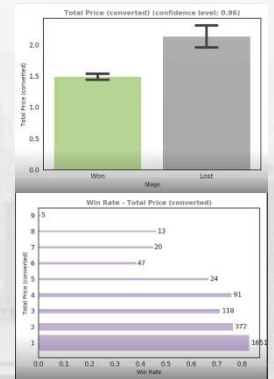
Insight: After several rounds of filters, Allison realized that the majority of the contracts were churn!

Allison: What's the impact of total contract price on the remainder?

Update  
AI

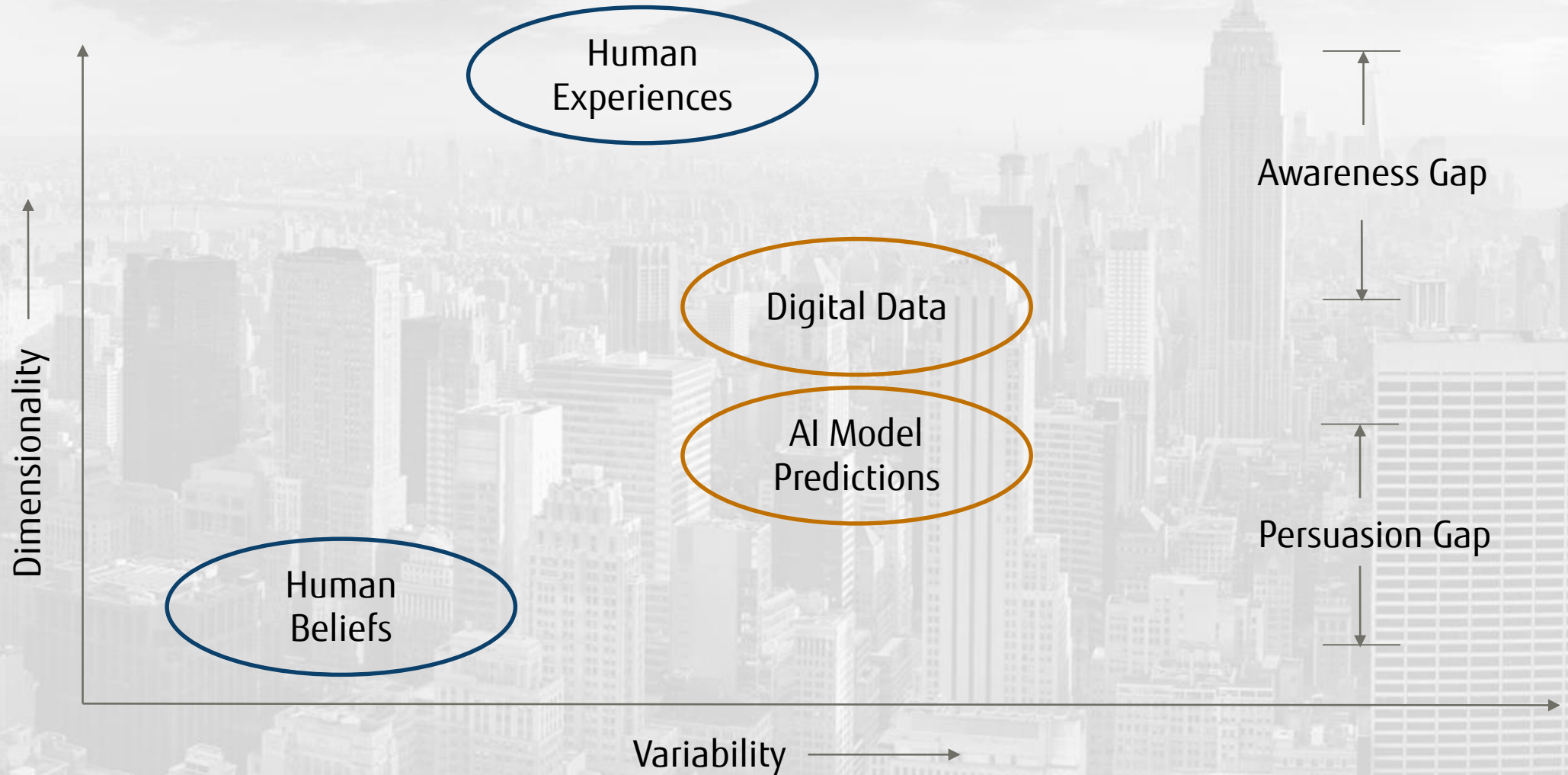
AI: Lower price is no longer better

Allison's Insight / Decision: Strategy must focus on getting new non-churn contracts with higher total price

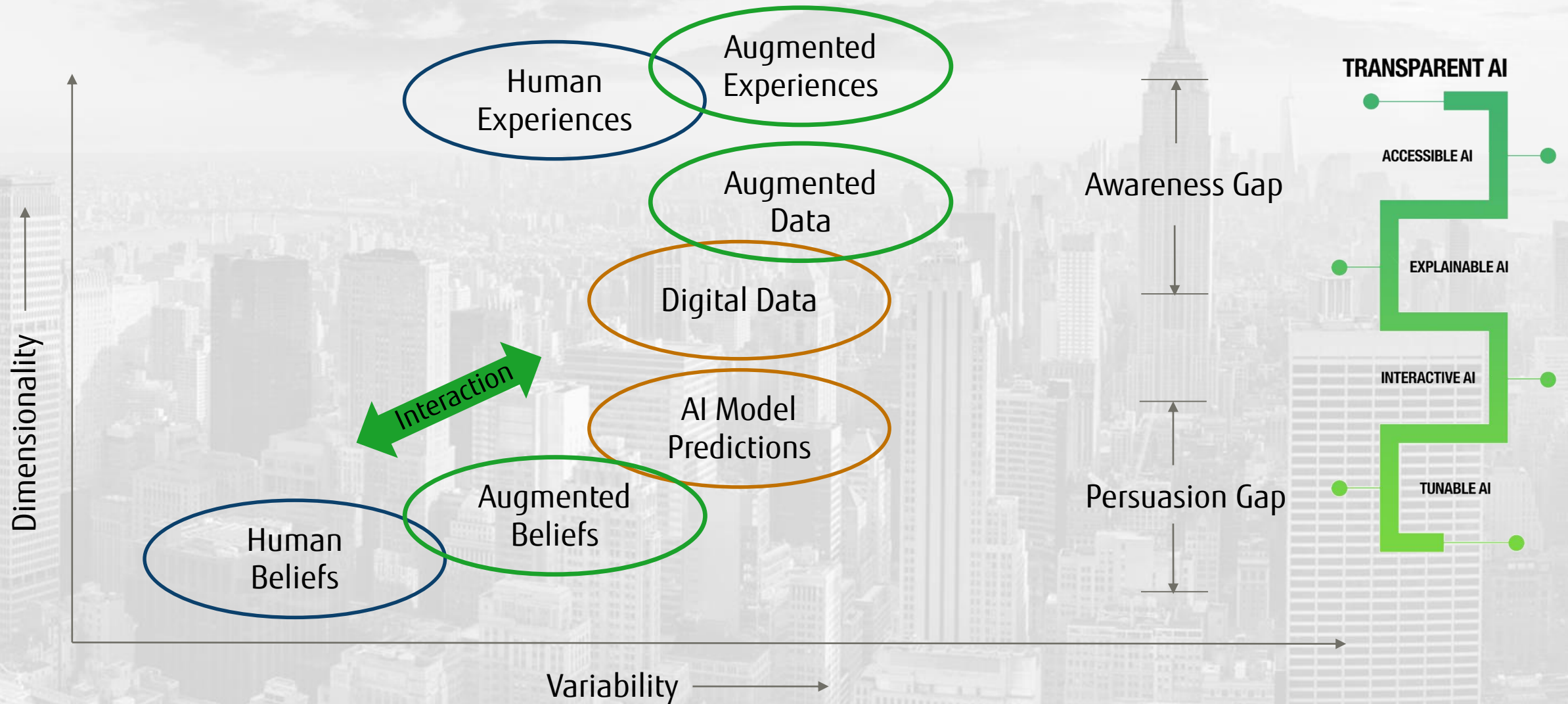




# The Search for Common Cognitive Ground



# The Search for Common Cognitive Ground



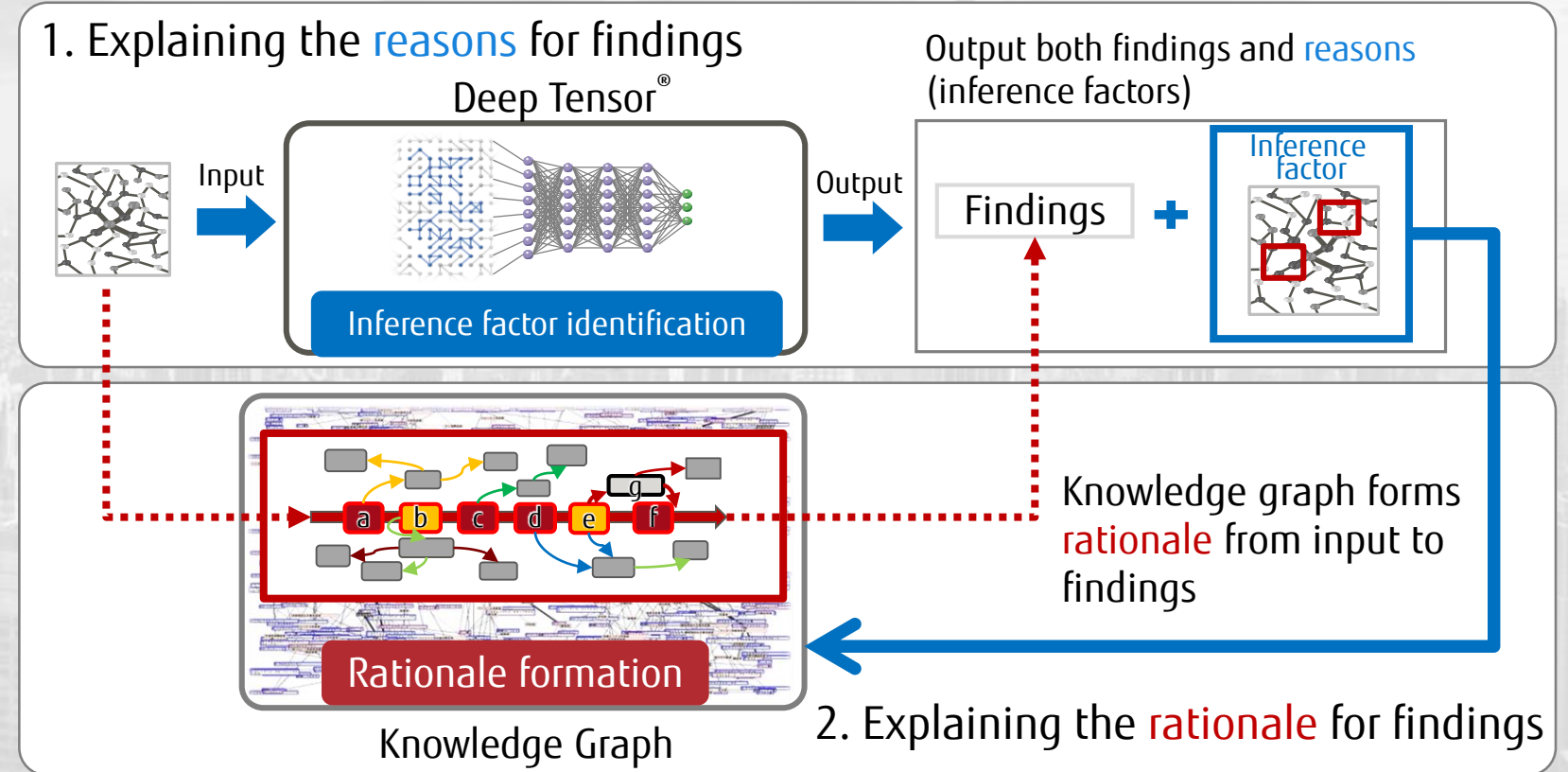


# Fujitsu Global Laboratories



# Explainable Deep Tensor<sup>®</sup>

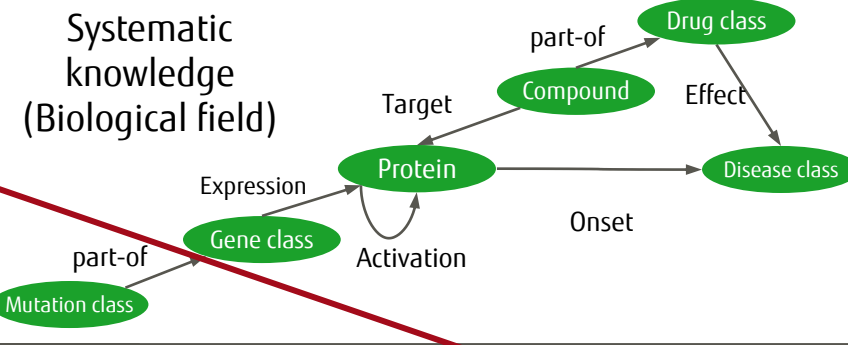
- Deep Tensor x knowledge graph -> **Reasons** and **rationale** of AI judgments
- Inference factor identification explains the behavior of the learning model as the reasons for findings from AI
- Rationale formation forms an explanation from input to findings and explains the rationale for the correctness of actions by AI



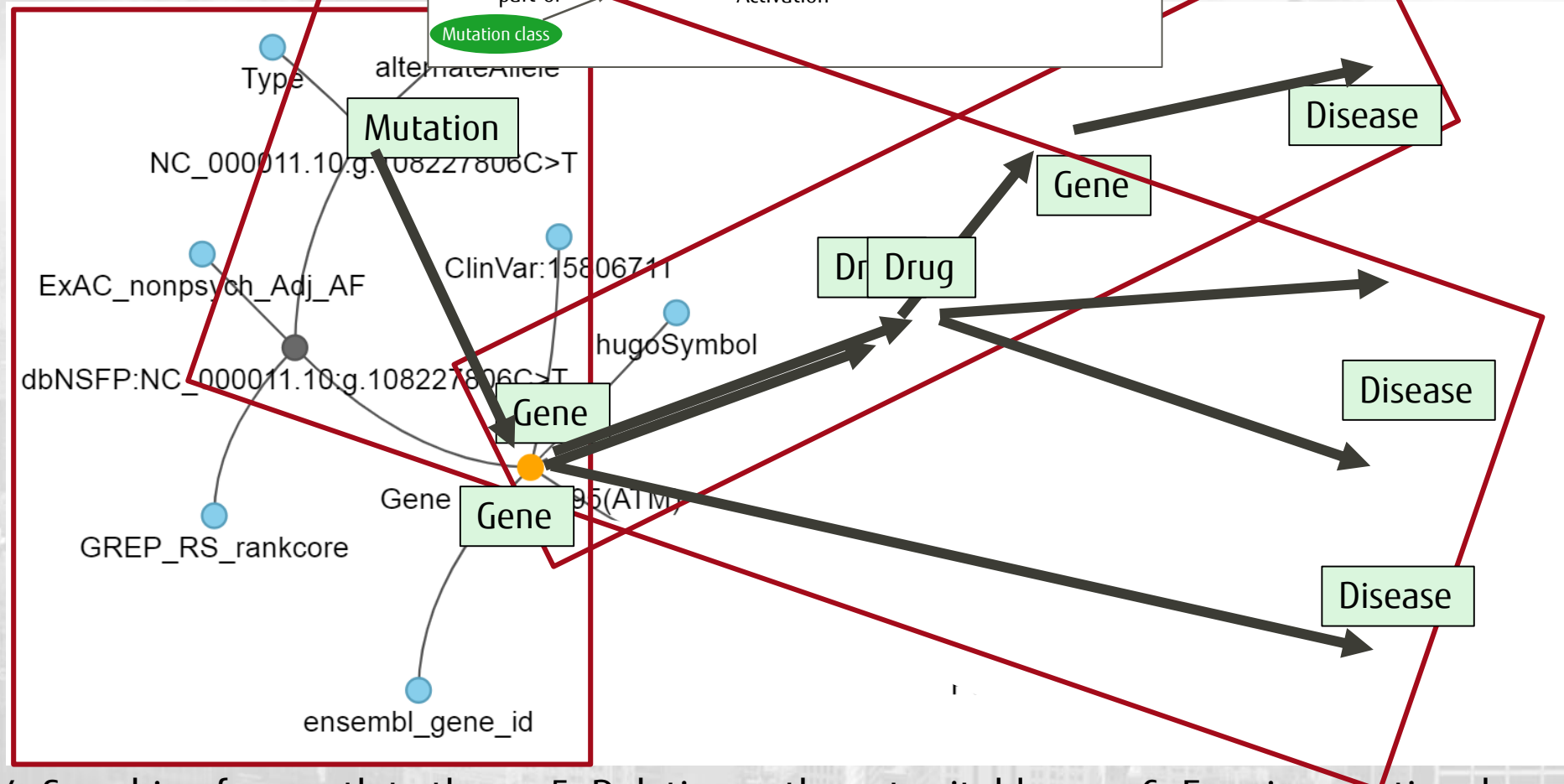


# Formation of Ratio

Systematic knowledge  
(Biological field)



# Knowledge Graph



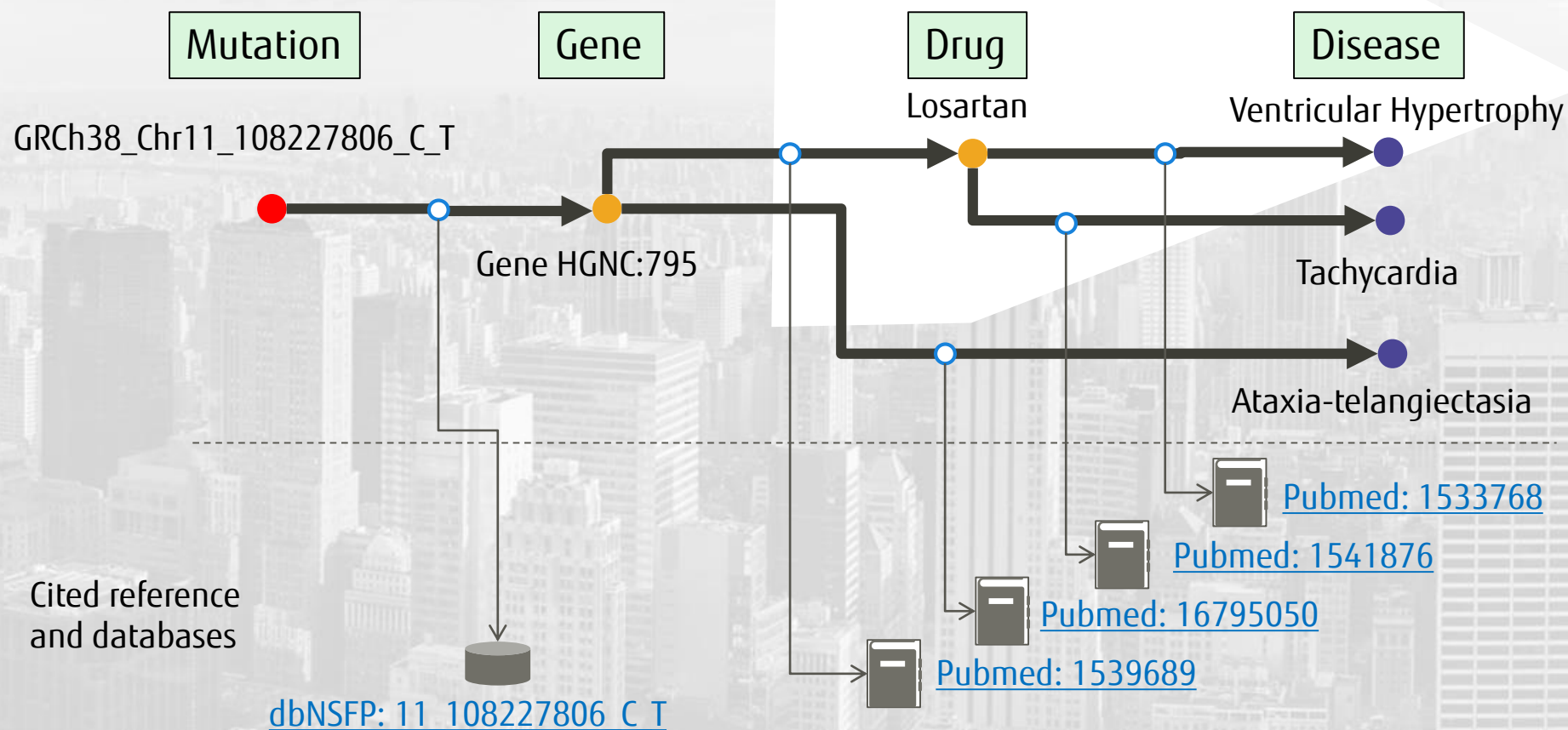
4. Searching for a path to the output node (disease) in the knowledge graph data

5. Deleting paths not suitable for explanation by using systematic knowledge

6. Forming a rationale path with remaining paths

# Formation of Rationale Path by Knowledge Graph

Rationale path ultimately formed





# Some ways of working with us



- AI center of excellence

- Research services around modern AI

- How to augment your business for the Digital Era

- Where do the opportunities exist? Sensing, Decision Making, Action
- What to do technologically and what to do organizationally

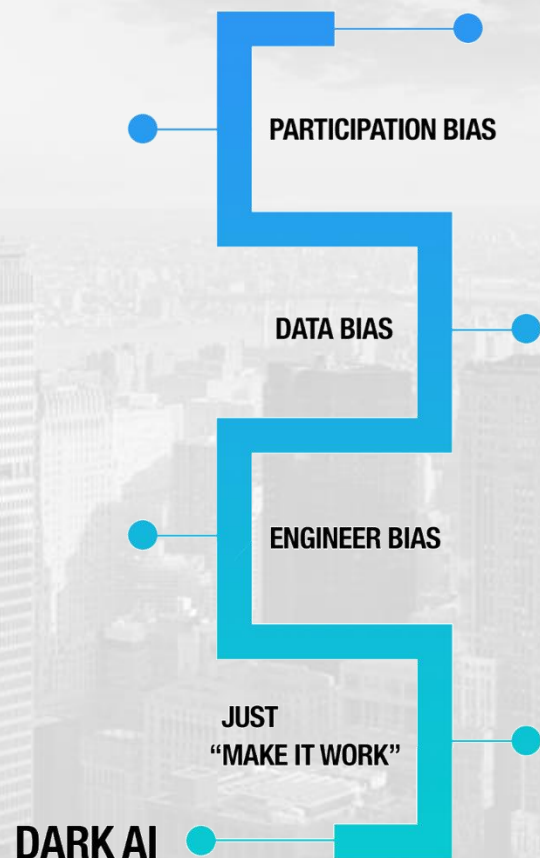
- How to effectively address your pain points

- Human-centered problem refinement
- Surgical applications of technologies for strength and growth

- Action to take now: email [ajayc@us.fujitsu.com](mailto:ajayc@us.fujitsu.com)

# Thank You!

Ajay Chander  
ajayc@us.Fujitsu.com



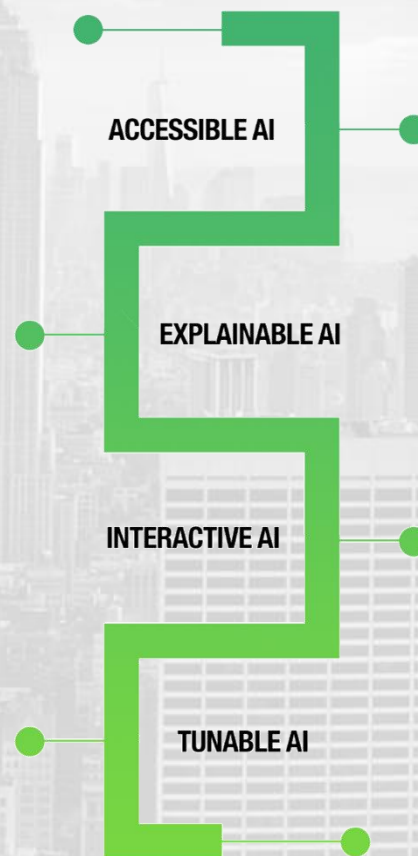
TRANSPARENT AI

ACCESSIBLE AI

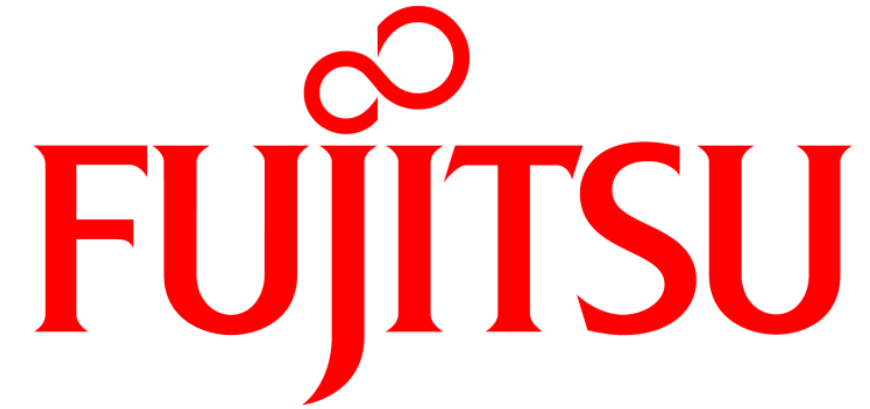
EXPLAINABLE AI

INTERACTIVE AI

TUNABLE AI







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