



**gLOCAL**  
SEMANA DA AVALIAÇÃO  
powered by GEI



**GEI**  
Global  
Evaluation  
Initiative

# Global Value Chains (GVCs) & Artificial Intelligence (AI)

**Abdullah Altun** (Assoc. Prof. Dr.)

Gebze Technical University & Schar School of Policy and Government



**#gLOCAL2024**

June 4, 2024

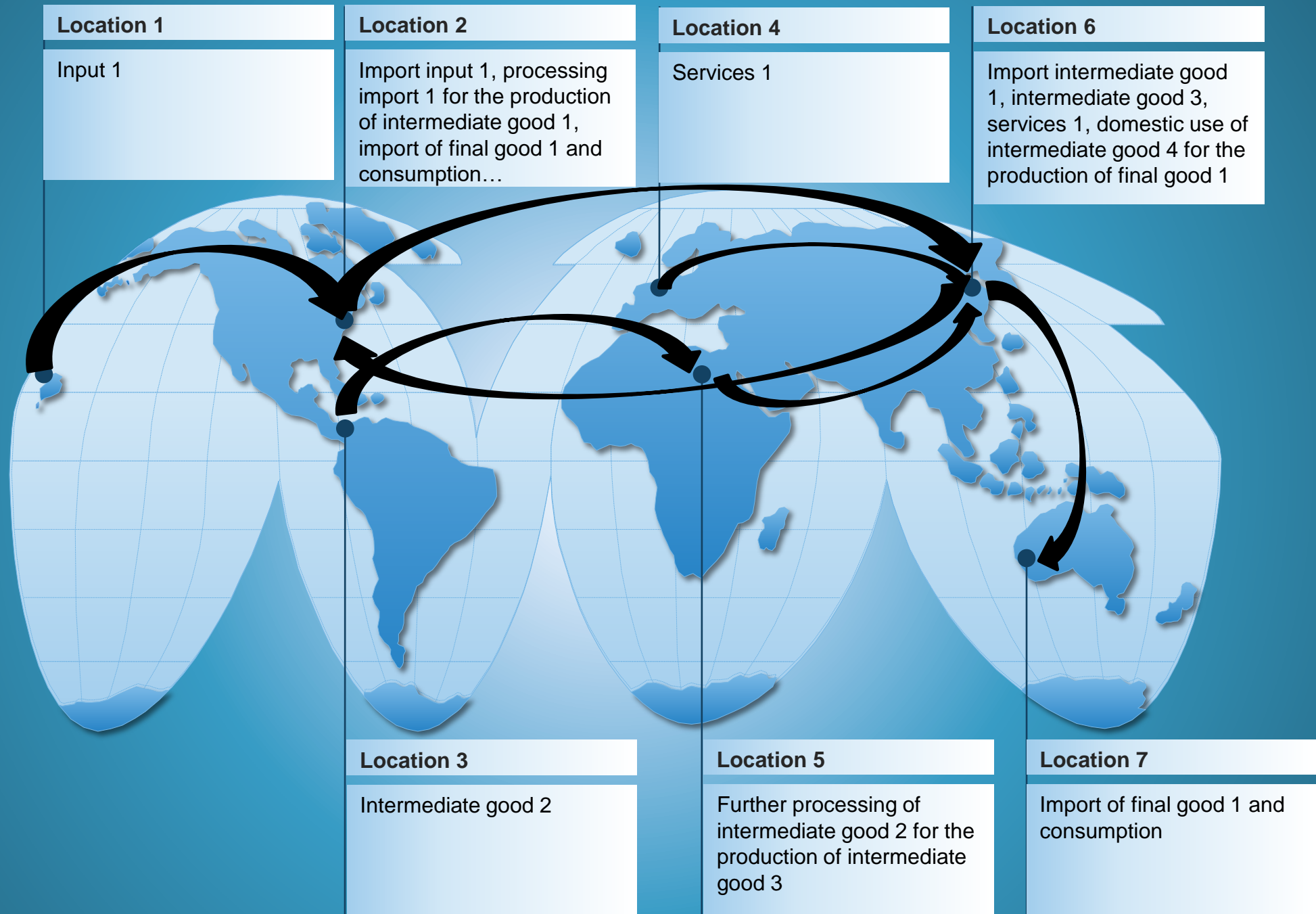
\*Abdullah Altun acknowledges support from the Scientific and Technological Research Council of Türkiye (TUBITAK).

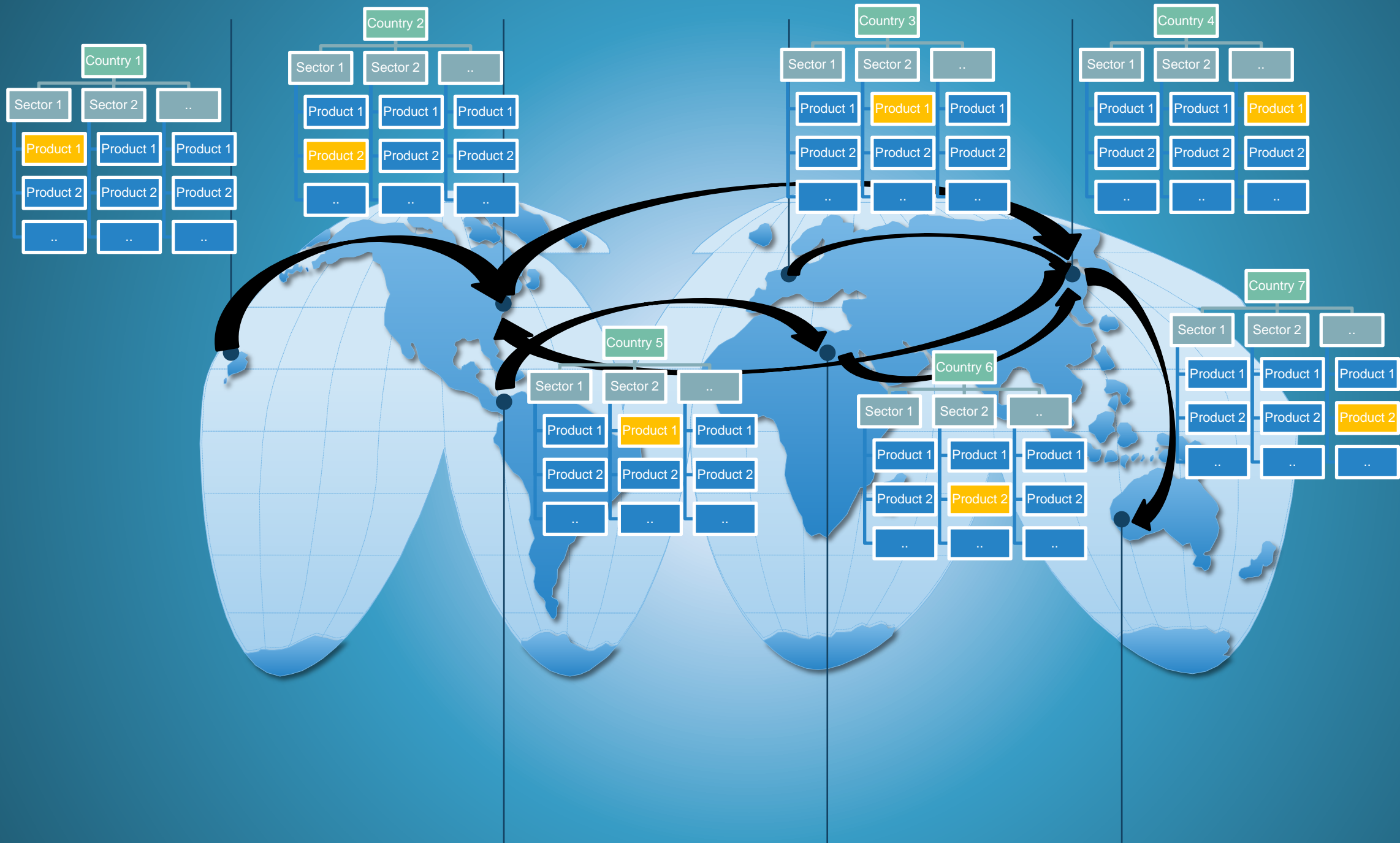
# GVCs

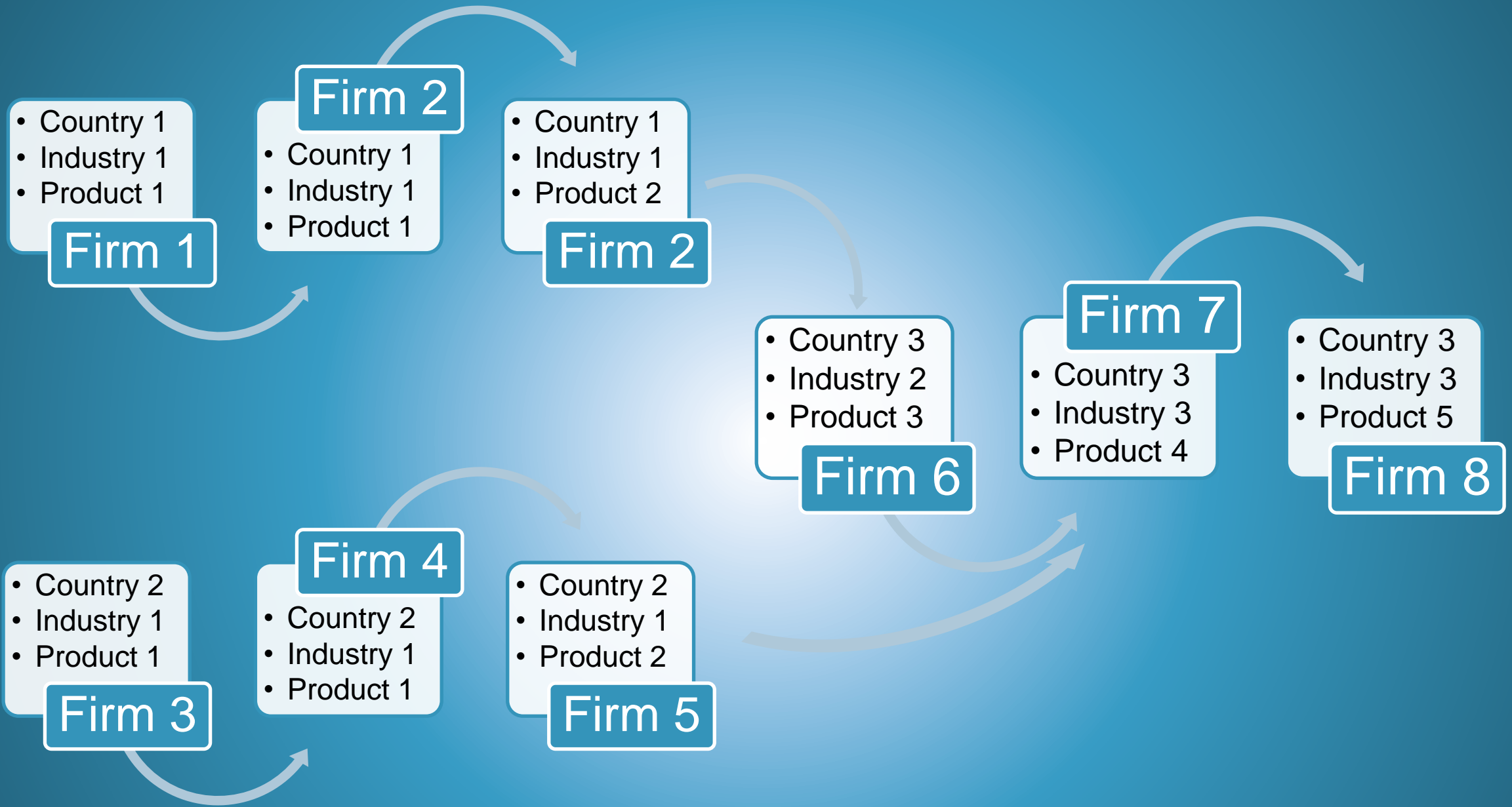
“The value chain describes the full range of activities that firms and workers perform to bring a **product** from its conception to end use and beyond. This includes activities such as research and development (R&D), design, production, marketing, distribution and support to the final consumer.” (Gereffi and Fernandez-Stark, 2016)

→ **product & service**











# Second Great Unbundling

- Production Fragmentation
- Global Value Chains revolution
- After 1990s, GVCs become the main structure of world economy

# *Transformation*

*changing  
structure of  
production*

*changing  
consumption  
patterns*

*radical and  
incremental  
innovations*

*south-south  
cooperation*

*climate  
change*

*AI*

*Conflicts*

*development  
efforts*

*unexpected  
and  
unpredicted*

**→ product & service value chains**

# How to Measure Transformation? & How to Predict Transformation?

Mapping Global Value Chains

**Previous State → Current State → Future State**

# How many GVCs can you map? (1)

- Advanced calculation skills
- Advanced computers
- Processing time by the available human and computer interaction
- Big data
- Various global, regional, national, firm level or other levels of data
- Lack of various data: missing links
- Unmatched data

# How many GVCs can you map? (2)

- As to mapping Global Value Chains (GVCs) and Regional Value Chains, the calculation of various GVCs related measures such as Koopman et al. (2010), Fally (2011), Antràs et al. (2012), Wang et al. (2017) and Wang et al. (2021) is not an easy process.
- As to product level analysis, this type of value chain mapping can only be possible with conversion keys prepared as a result of big efforts.
- Without having advanced calculation skills, big data of almost all relevant variables (from firm level to product level. From sectoral level to country level), without the required advanced hardwares and softwares, without the direct support of academicians (limited number in the field) and without the intervention of various stakeholders, successful and satisfactory level of mappings of GVCs are not possible.
- *So it is necessary to state here again that the Augmented Intelligence concept appears to be an important solution within this context.*

## *Holistic View?*

*import  
substitution*

*export-  
oriented  
policies*

*trade in  
value-added*

*trade in  
employment*

*trade in  
emissions*

*domestic  
investment*

*inward FDI*

*outward FDI*

*innovation  
systems*

*financing &  
incentives*

*skill  
development*

*firm profits*

*trade  
networks*

*government  
intervention*

*development  
support*

# So

- Combining relevant and related other data (wherever available on the internet or cloud environments)
- Filling the gaps: missing links and unmatched data

# *What we are trying to do...*

- To test the limits of available AI alternatives and models for the mapping of GVCs
- Supporting firms for the international trade
- Amazon Q & Amazon Web Services
- To improve and train AI for more prosperous outcomes in terms of economic, social and human development...

# So far

- We have prepared very large datasets (in panel data format) for each domain:
  - International trade data
    - Product level
  - Country specific data
  - Country-sector specific data
  - Calculations of GVC measures in various levels by various methodologies
    - Sectoral Level
    - Product Level
    - Sectoral Level FDI-Led

# So far

- Storing Data in AWS S3
  - Splitting data into smaller pieces by the **R** and Python
  - Longer sessions time to upload satisfactory level of relevant data (one session)
- Country level, sectoral level, product level prompts for mapping associated with the training.
- Prompts for further discussing strategy generative roles of AI models
- Train AI model as a decision support system for promoting international trade for government level and for business level separately.
- Integration of firm level big data
- Integration of big patent data (from cloud environment)
- Emissions data...

Thank You...