



Remote Capabilities Assessment

Understanding Structures and Statistics of Scientific Networks for Nuclear Threat Detection

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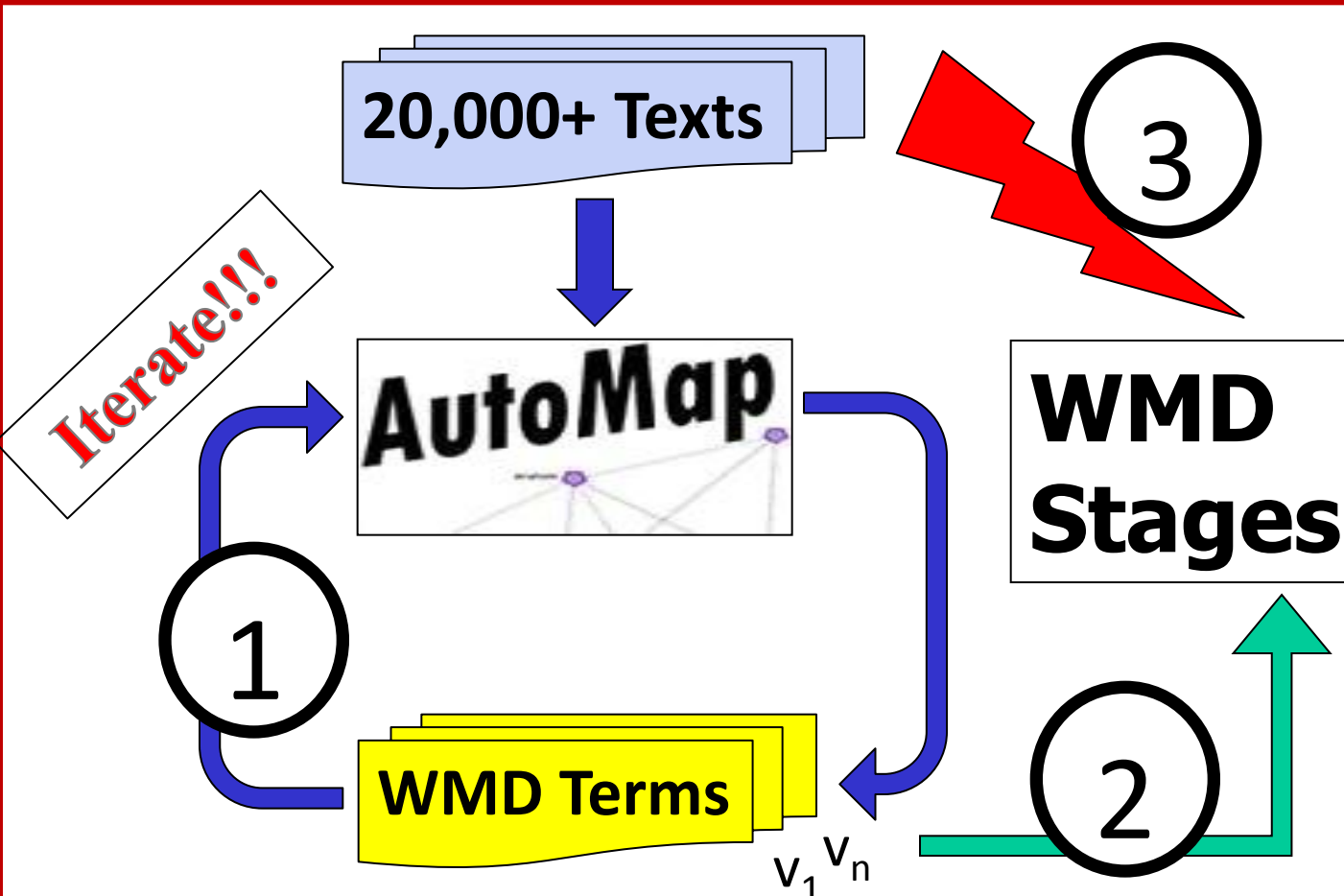
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Objectives

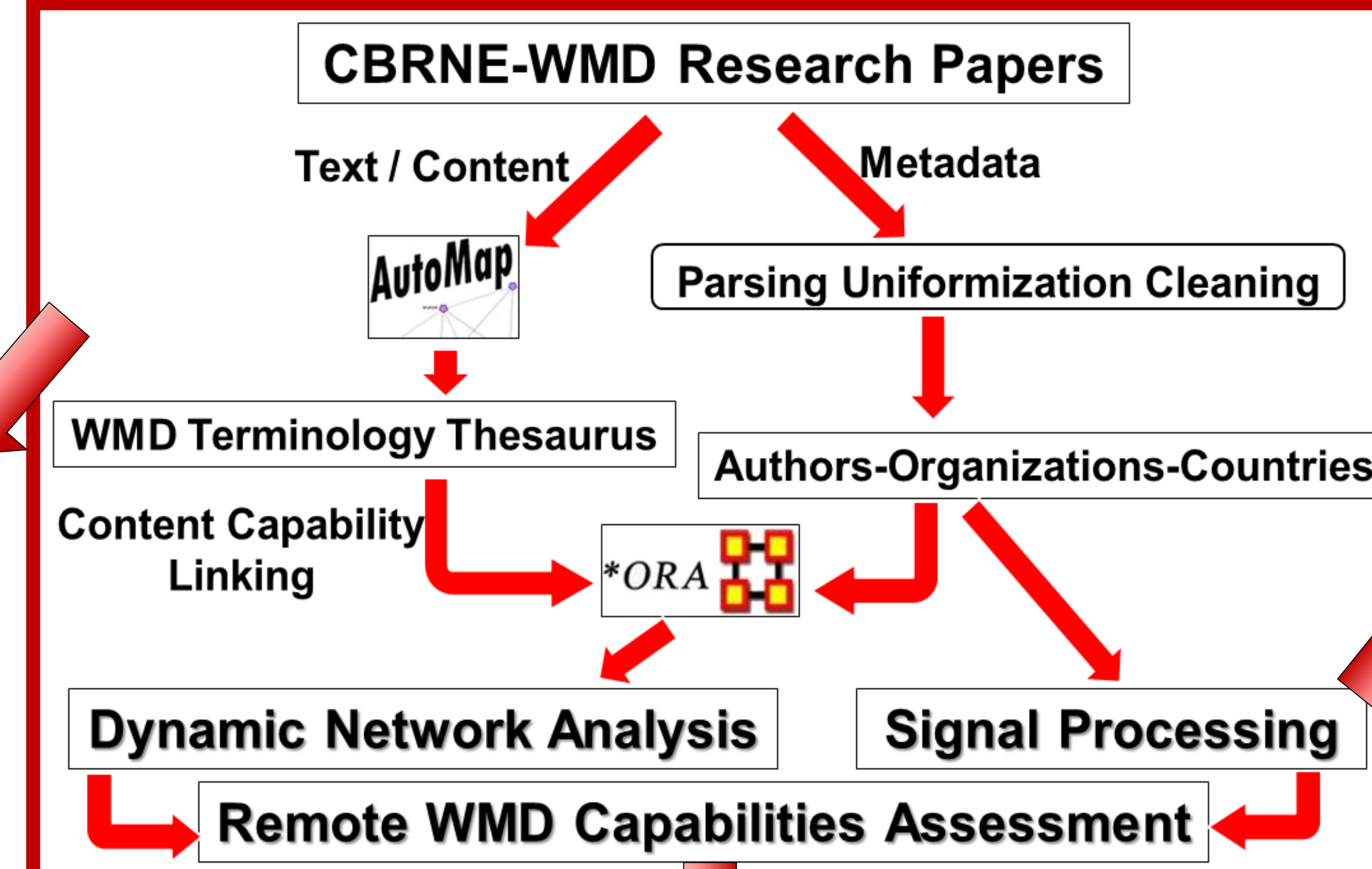
- Identification and network representation of key WMD expertise
- Identifying key experts by region (organization, city, country)
- Detecting trends and changes in WMD expertise over time

Ontology/Thesaurus Development

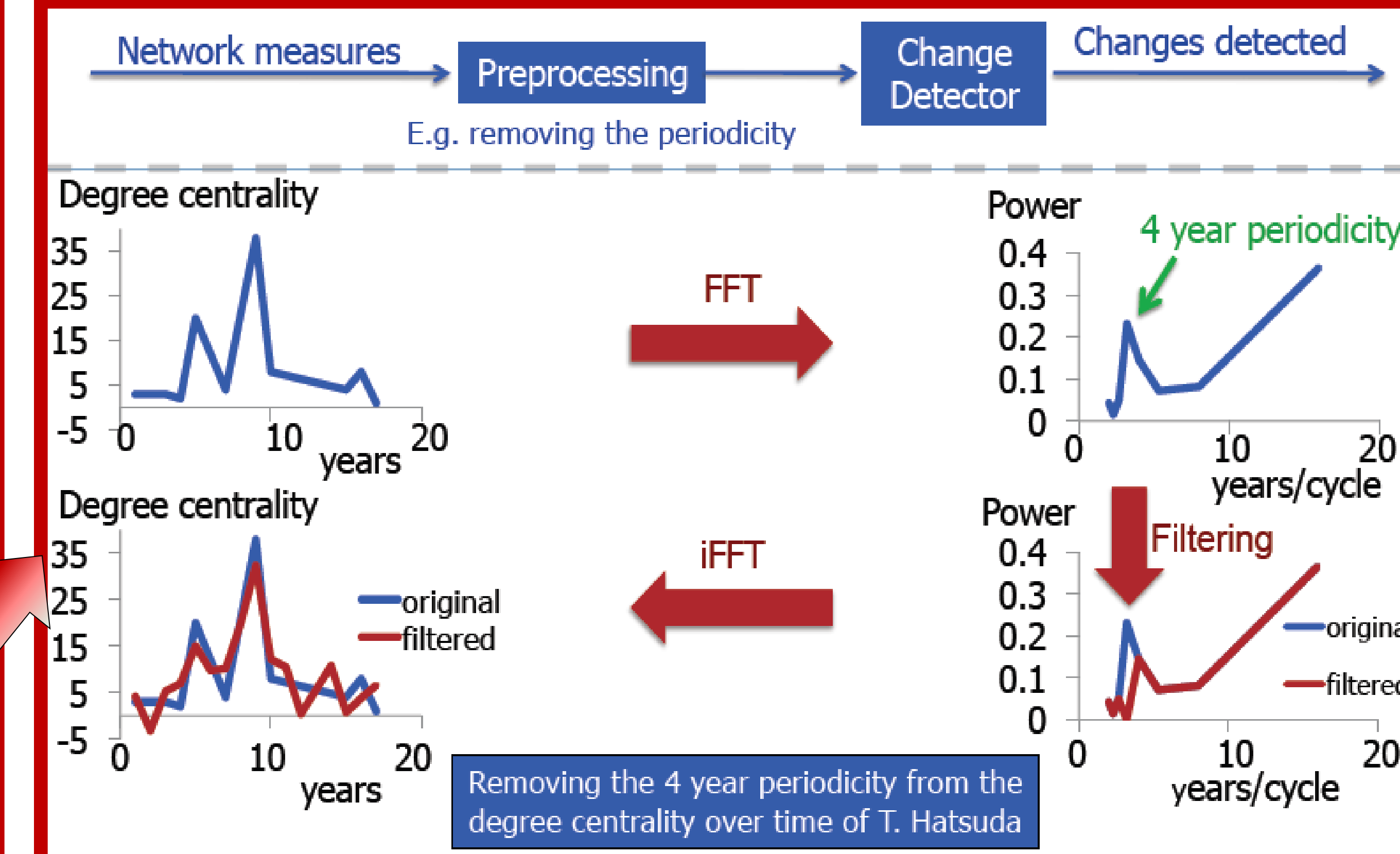


- Outcomes:**
- 1) 180K+ Thesaurus
 - 2) WMD Stage-Terminology Classification
 - 3) Which paper talks about which stage(s)?

METHODOLOGY – WORK FLOW

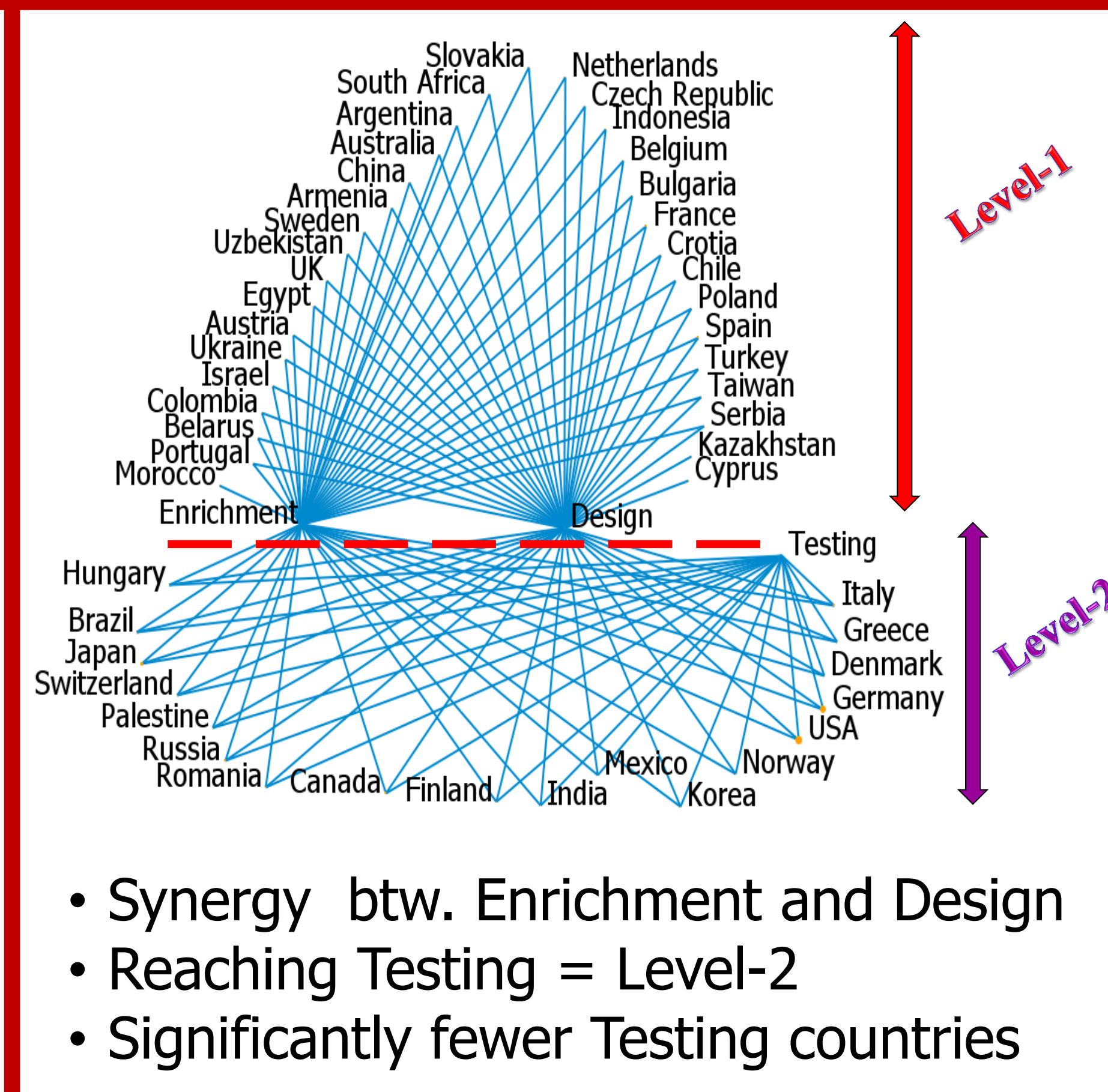
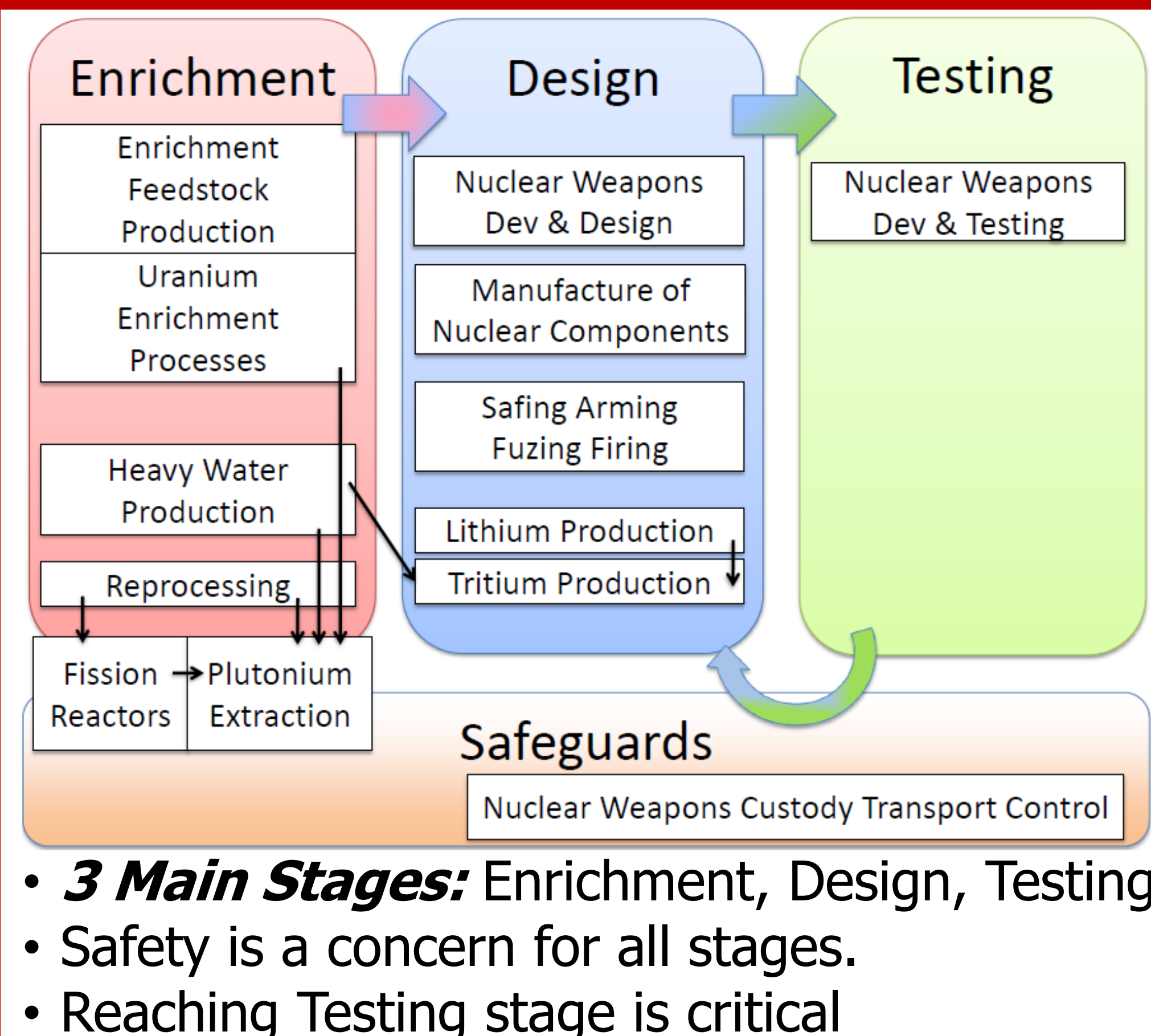


Signal Processing & Change Detection

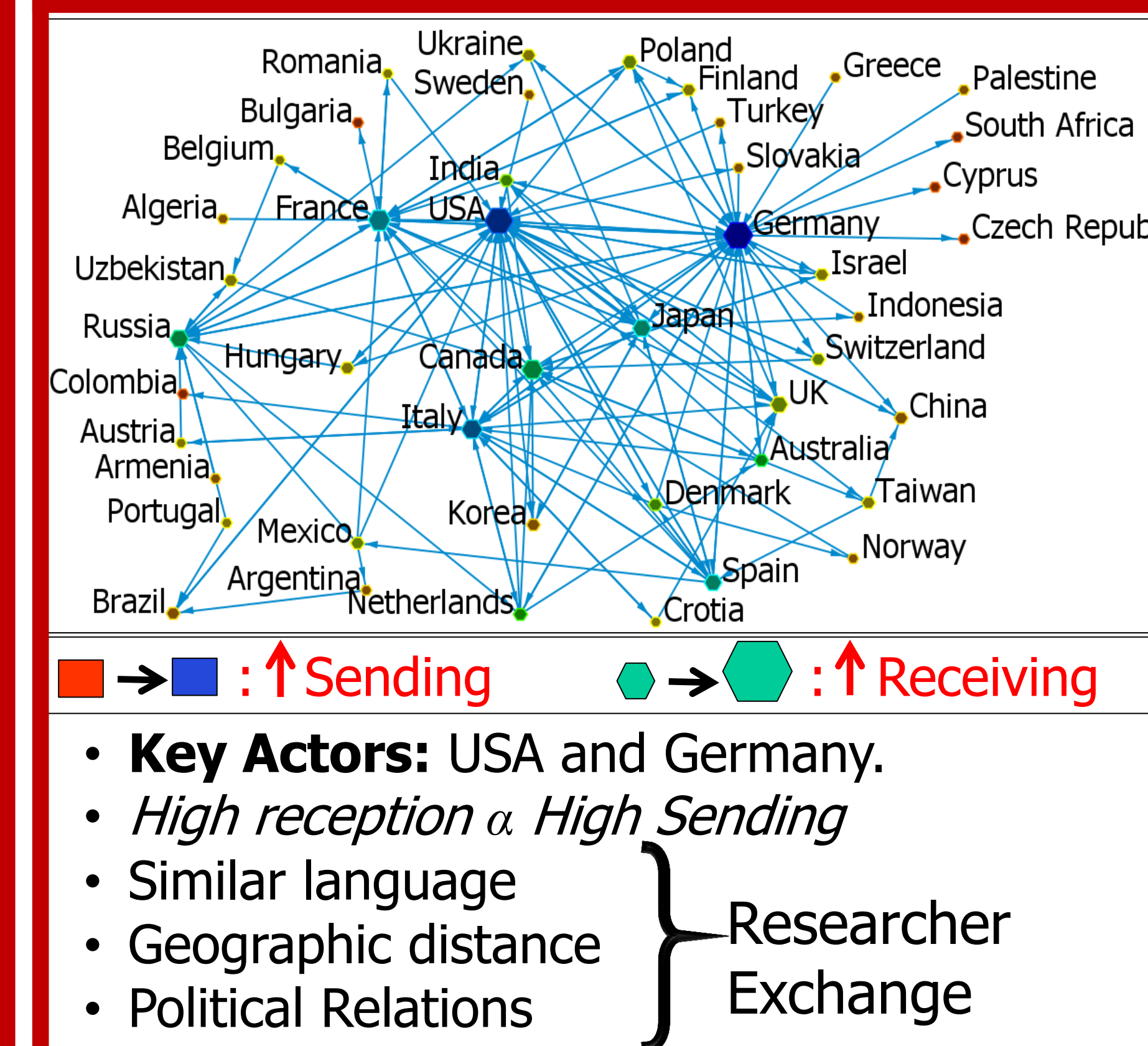


DYNAMIC NETWORK ANALYSIS

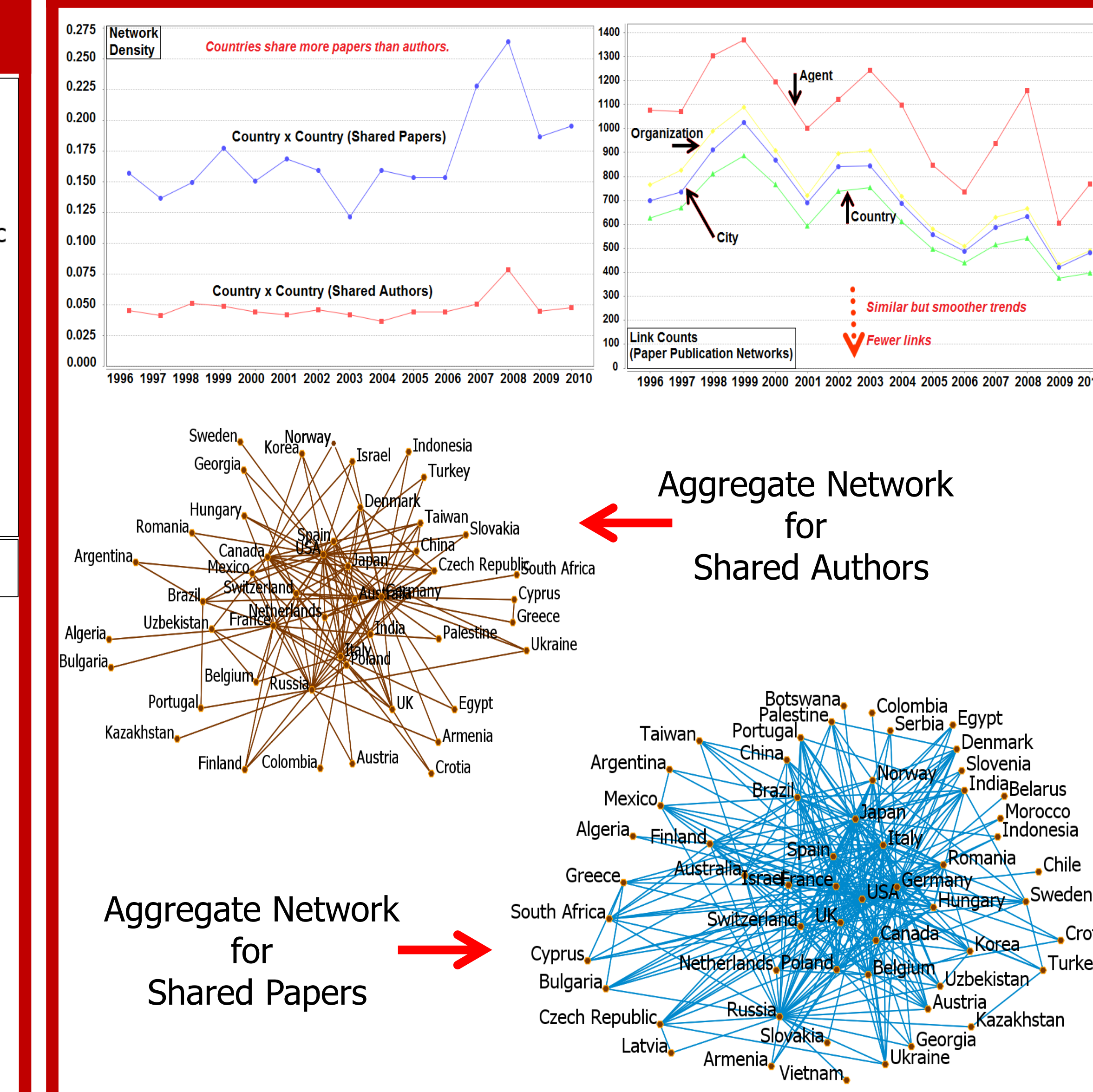
Nuclear Weaponization Stages



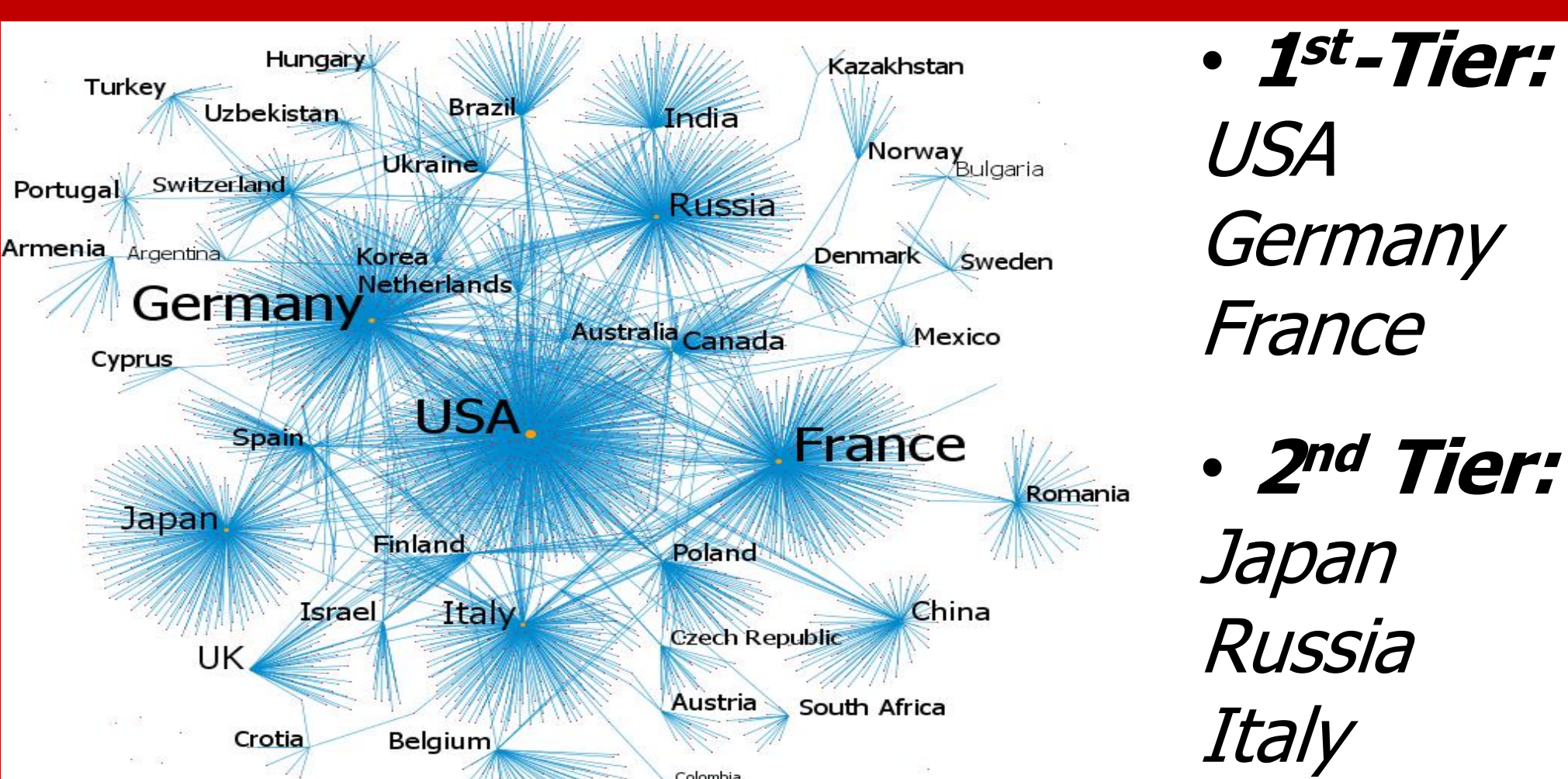
How Information Travels? (Researcher Mobility)



Network Evolution Trends

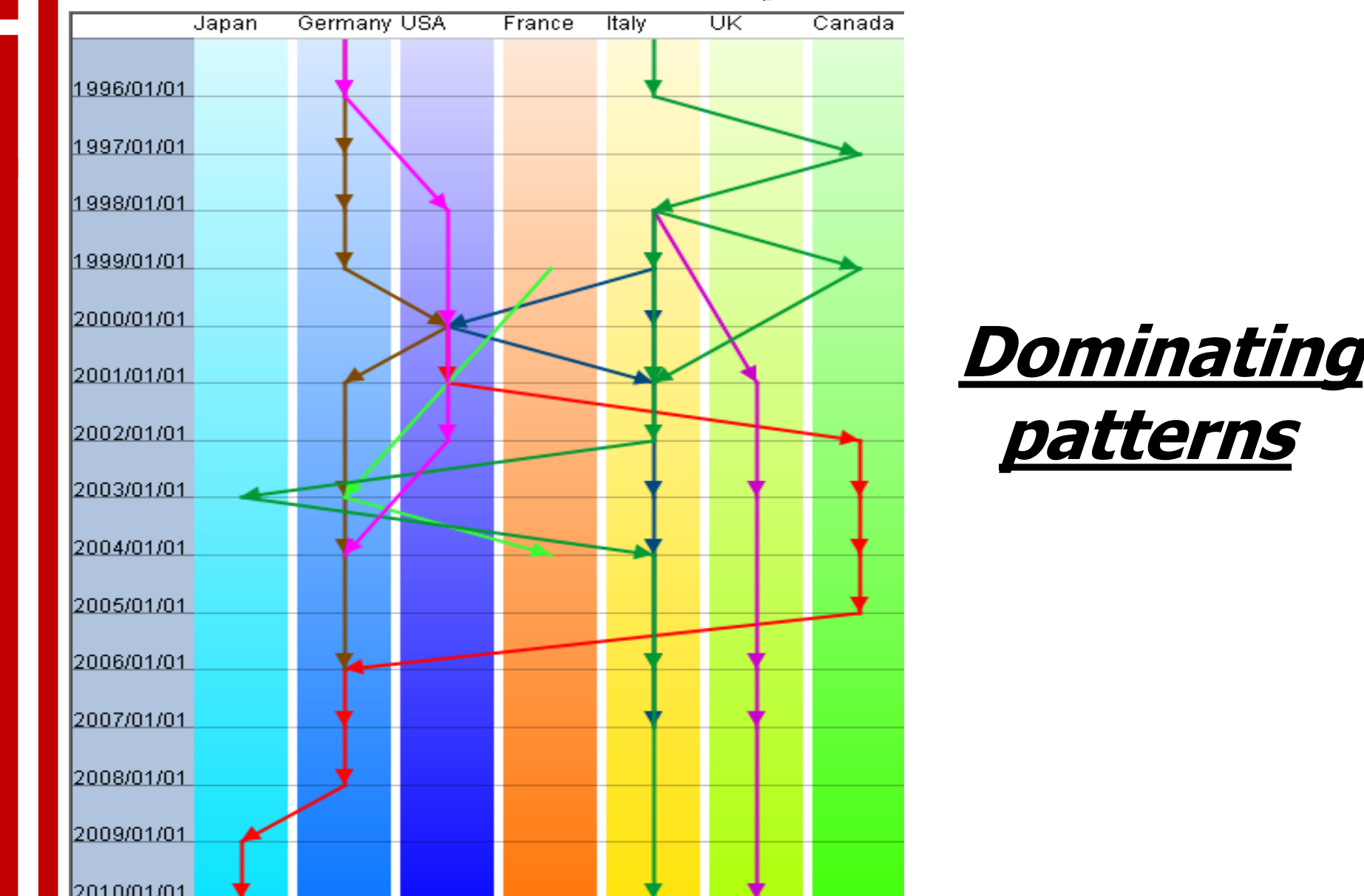


Countries' Researcher Clouds



Centrality Champions

Countries	States	Cities
USA	NY	Moscow
Germany	CA	Darmstadt
France	OH	Tokyo
Russia	MI	Orsay
Italy	TX	Frankfurt
Canada	WA	Berkeley



Future Work

- **Step-1:** Complementing nuclear data with information on Iran, North Korea, and Pakistan.
- **Step-2:** Chemical & Biological weapons.