

Sustainability and Cyber Sustainability: complexity models in a GSSD* perspective



Explorations in Cyber International Relations
Massachusetts Institute of Technology Harvard University

Jean-François Mascari, National Research Council, Italy
In collaboration with **Nazli Choucri**, Political Science, MIT

Workshop on **Cyber Security & Governance Gap**
MIT, January 6 and 7 2014

Problem

Interactions of Sustainability and Cyber access are increasingly recognized in International Relations. Based on the co-evolution of Sustainability and Cyberspace a new research area is now emerging, which we call: "Cyber Sustainability". New: integrated conceptual and analytical foundations call for transdisciplinary approach to support the development of knowledge intensive policies and practices.

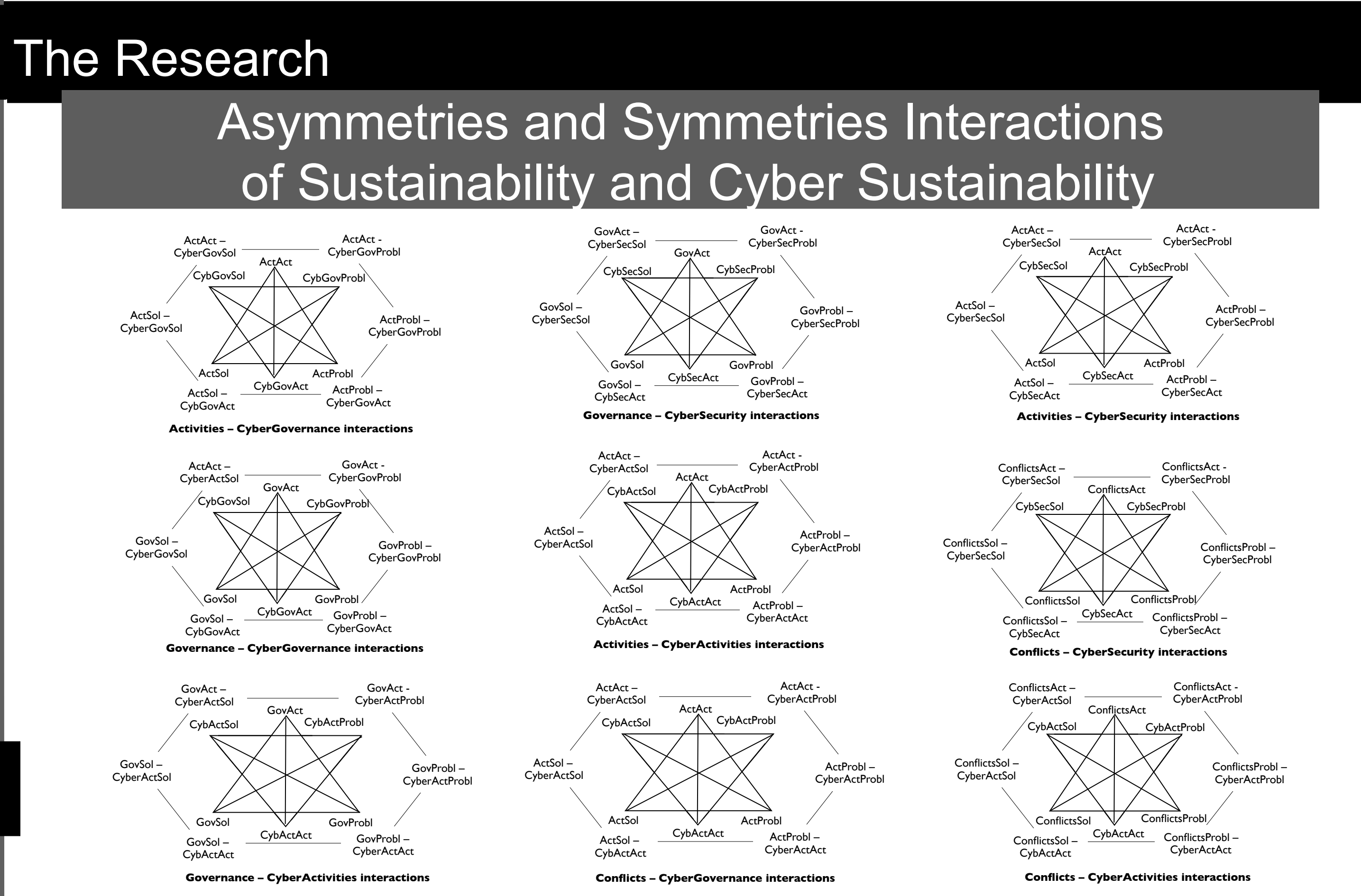
***Global System for Sustainable Development (see gssd.mit.edu)**

Methods

Develop an algebraic framework capturing the asymmetries and symmetries of the Lateral Pressure Theory & analysis of demand-capacities interactions.

Unveil the asymmetries and symmetries of the GSSD Sustainability modeling of the interactions of PRT activities with Governance and Conflicts.

Develop a similar framework for «Cyber Sustainability» including Cyber Governance and Cyber Security as acting forces on Cyber Activities.



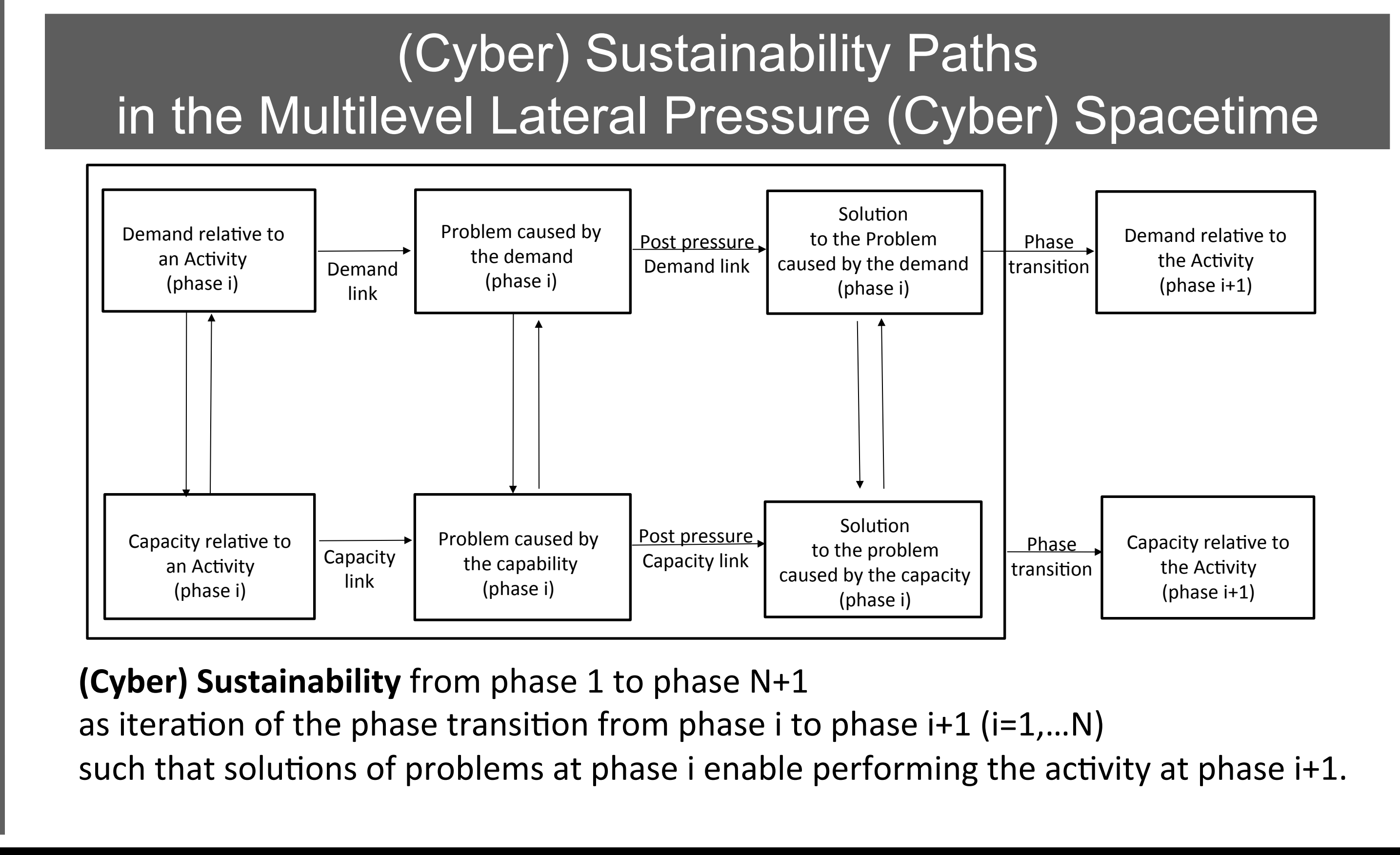
Preliminary Results/Results

The common foundations for Sustainability and Cyber Sustainability, are based on the principles of Lateral Pressure Theory and the mathematical methods of Higher Category Theory.

Mathematical model of the complex network of the asymmetries and symmetries interactions, obtained by the composition of interactions patterns.

Characterization of (Cyber) Sustainability as paths in the (Cyber) Lateral Pressure multilevel spacetime of PRT* and cyber activities.

***PRT refers to the interactive effects of population, resources, & technology**



Remaining Research/Follow-up

Design of a Global System for Cyber Sustainability based on

- a mathematical model interacting with (via simulations)
- a «WEB of Systems» capturing empirically based Population, Resources and Technology interactions and generativities.