



Proposed Framework for Analysis of Intellectual Property Structures in the Agricultural Biotechnology Cluster

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The research project....

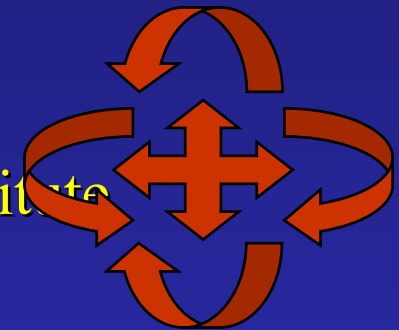
- Examine / analyze flows of knowledge in the regional innovation system
- Explore how intellectual property is created, managed and commercially exploited
- Determine how these flows contribute to the development of a local agriculture biotechnology innovation cluster





Saskatoon's innovation cluster...

- one of the few identifiable ag biotech clusters in the world
- narrow product focus - Canola
- near the University of Saskatchewan
- anchored by NRC's Plant Biotechnology Institute
- has a reputation for introducing 'world firsts'



» this is an indication of the cluster's...

- *networking capacity and comparative advantage in the global market*



Canola industry...

- 5 generations of innovative development
 - » covering mid 40's to present day
- from *'linear form / supply driven to chain link'* to *'technology push'* iteration
- today....
 - » characterized by strong links with customers
 - » strategic alliances with suppliers / competitors / other actors
 - » increased focus on *quality* and *non-market* issues



Converging IP Structures...

■ What was/is....

- » strategic alliances, collaborations, licensing

■ Today...

- » Increased emphasis on *non-market* issues
- » GELS - genomics, ethics, environment, law & society
 - *Genome Prairie Abiotic Stress Project*
 - *Director: Dr. Graham Scoles - U of S*
 - *Project: to investigate cold tolerance of wheat and canola*
 - » *21 principle investigators*
 - » *5 universities*
 - » *3 federal labs*
 - » *3 international collaborators*



Converging IP Structures...

■ Where we are going...

» Canadian Light Source Synchrotron

- *IT, geography, medical imaging & biotechnology*
- *international component*

– *new transient social capital*

» *2000+ expected annually*





Need framework to examine IP structure(s)...

- Emphasis on activities and objectives of...
 - » ...different actors....
 - » ...leveraging different types of knowledge...
 - *know-why, know-what, know-who, know-how*
 - » ...with different methods of knowledge valuation
- Thus, the framework...
 - » ...requires an interdisciplinary approach



Cluster activities...

■ Science

- » pure research
- » academics, university / post-secondary institutions / public research institutes

■ Technology

- » applied research
- » MNEs, SMEs / related and supporting firms

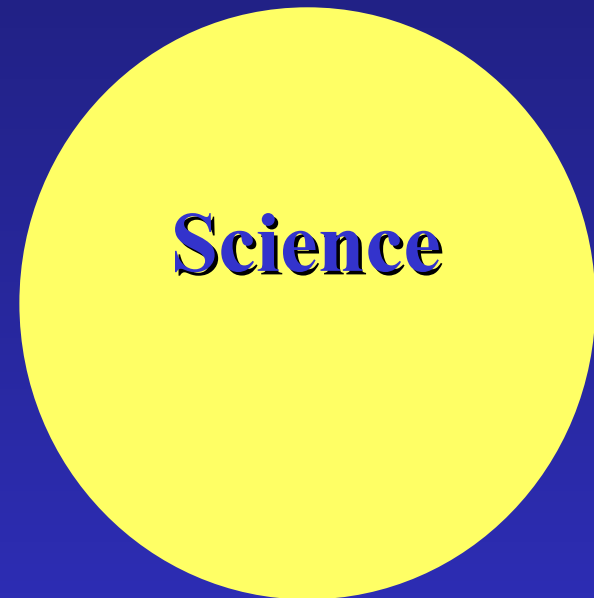
■ Collective Initiatives

- » pool knowledge to maximize benefits for m'ship
- » commodity groups



Activities & objectives...

- » *know-why* knowledge
- » *not-for-profit* based objective(s)
 - *increase public welfare / public knowledge*
- » *cost-benefit*-based approach to knowledge valuation
- » *IP mechanisms* - publication and copyright





Activities & objectives...

Technology

- » *know-what* knowledge / technological application of academic pure science
- » *profit-based* objective(s)
- » *accountancy*-based approach to knowledge valuation
- » *IP mechanisms* - patents / trade secrets / varietal testing and registration system



Actor activities & objectives...

- » *know-who / know-how* knowledge
- » objective: maximize *collective* action
- » less clear but assume *strategy*-based approach to knowledge valuation
- » IP mechanisms - less formal / shared language and common culture

**Collective
Initiatives**

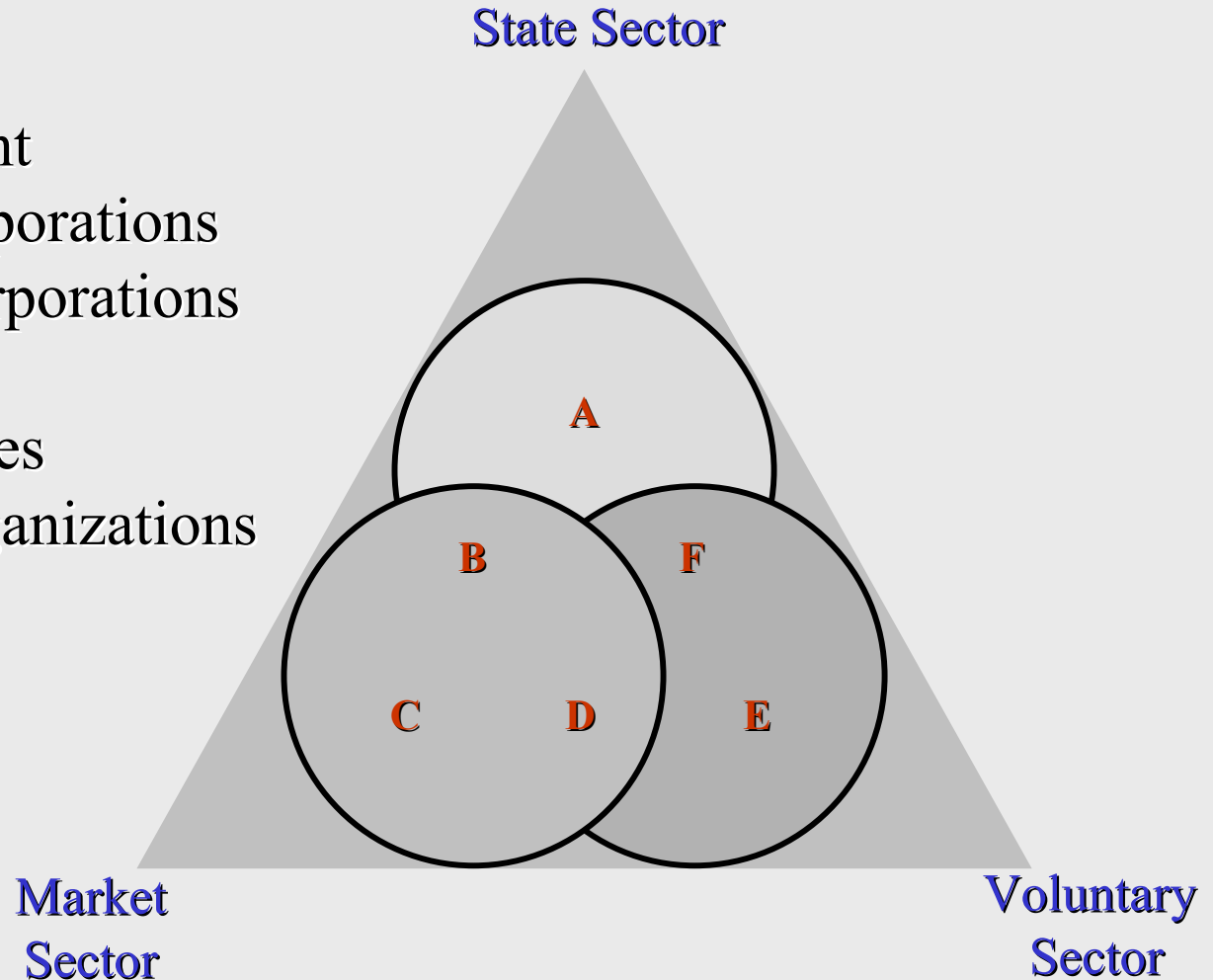


Conceptualizing the framework...

- Need a foundational model to work from...
 - » Picciotto model:
 - *Putting Institutional Economics to Work: From Participation to Governance (1996)*
 - *systematic framework for institutional design*
 - *illustrates the interaction of the state, market and voluntary sector*
 - *addresses development at the project, country and global level*
 - *examines the intersection between institutional economics and development practice*

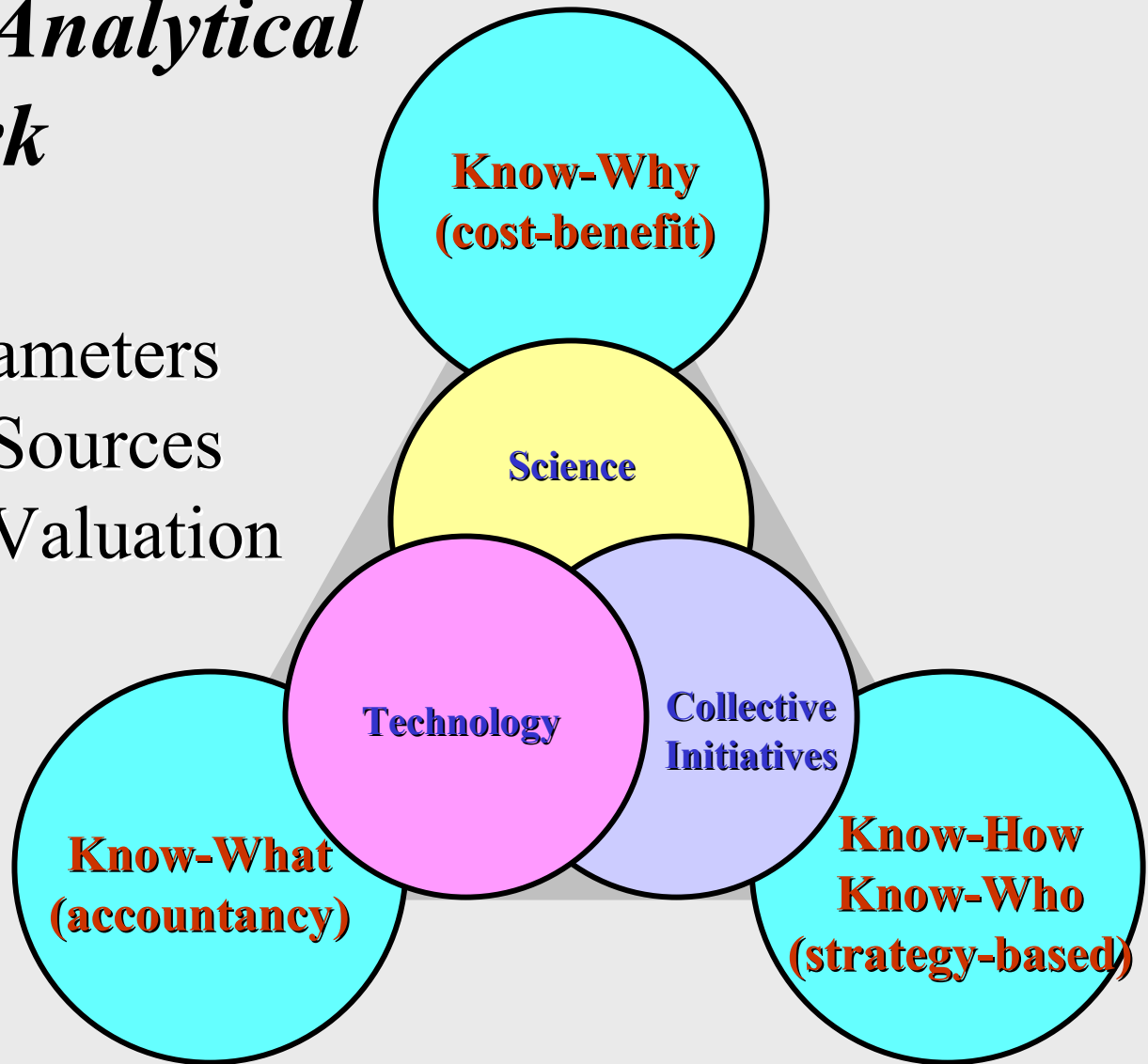
Picciotto Model

- A.** Government
- B.** Public Corporations
- C.** Private Corporations
- D.** NGOs
- E.** Cooperatives
- F.** Hybrid Organizations



Proposed Analytical Framework

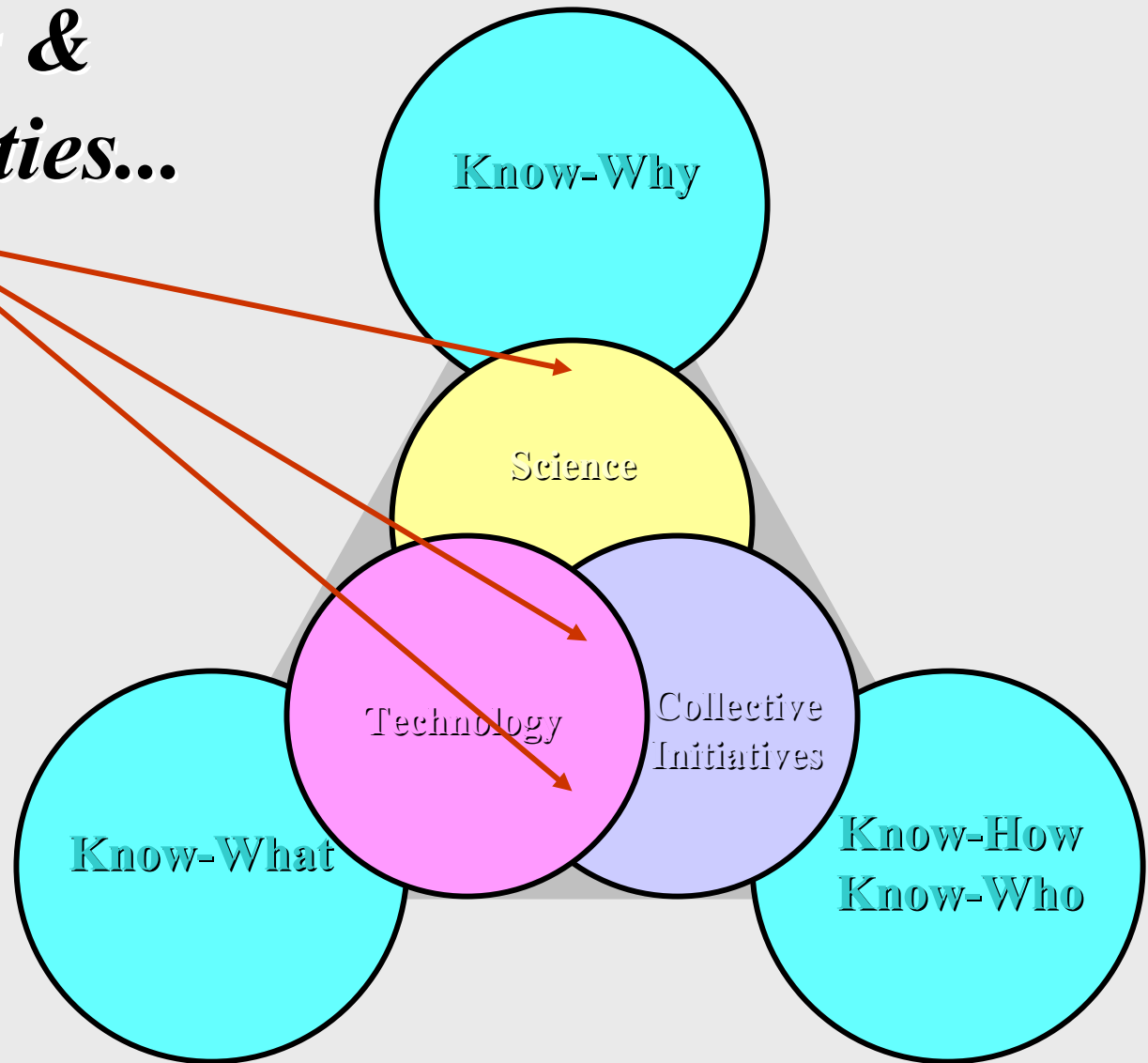
Activity Parameters
Knowledge Sources
Knowledge Valuation



Overlaps & Ambiguities!!!!

Overlaps & Ambiguities...

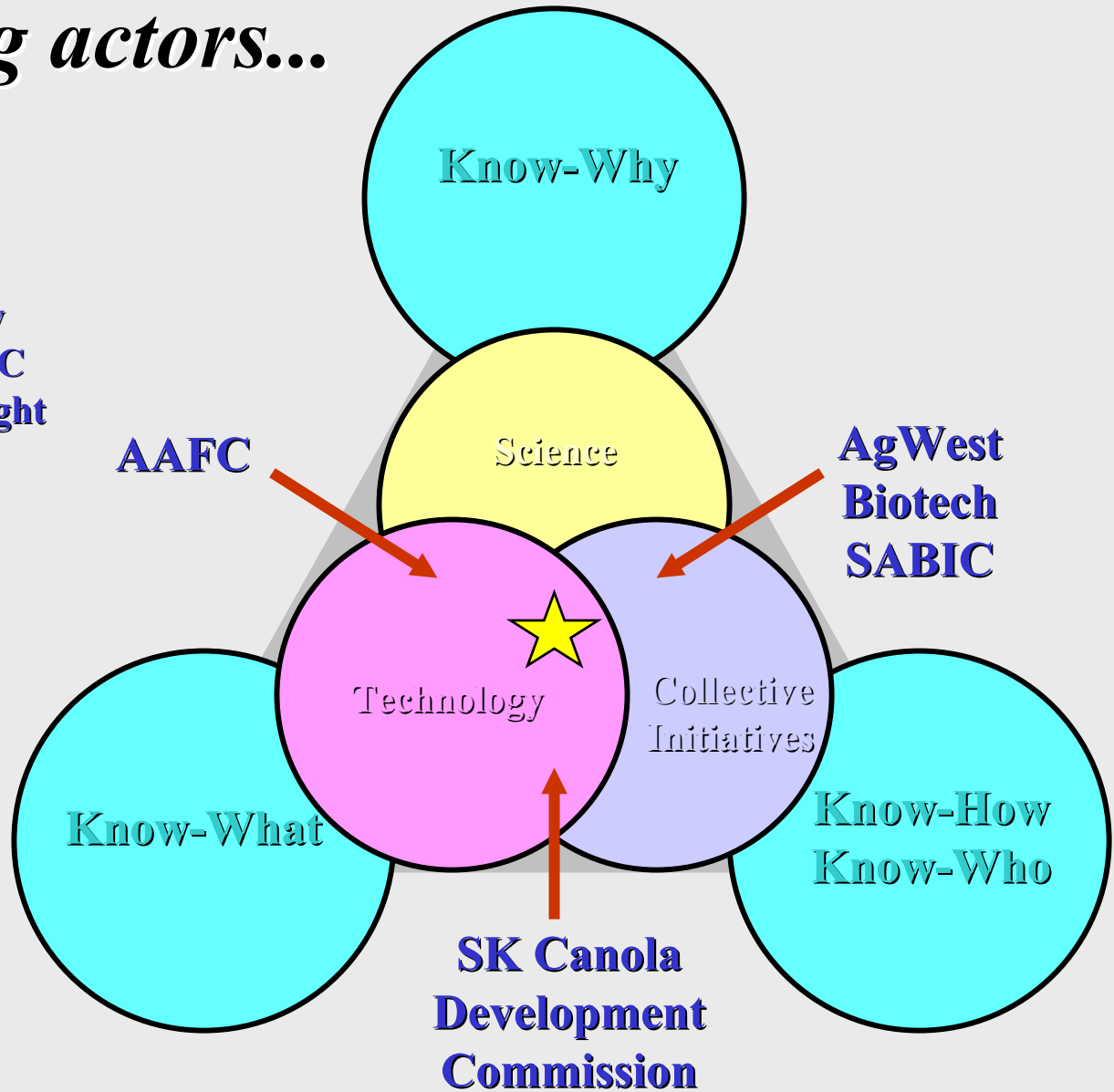
..indicators of how knowledge is leveraged **within** and **between** actors



Intersecting actors...



•Plant
Biotechnology
Institute / NRC
•Canadian Light
Source
Synchrotron





Framework's analytical capacity...

- Model, as it is....
 - » appears to be in “equilibrium” with activities deemed equidistant
- However, in application must focus on whether...
 - » actors are fulfilling roles / activities
 - » actors are flexible
 - » all types of knowledge are being effectively leveraged and disseminated
 - » there is a balance of activities / objectives across actors for maximum cluster flexibility and success...



The adapted framework...

- ...validates the innovation cluster as a collective network of actors AND activities...
 - » ..illustrates the interaction of the various actors
 - *according to their respective roles/activities*
 - *in how they value and leverage the knowledge network*
- ...provides a model to evaluate intellectual property structures in the innovation cluster



Thank-you / Merci!

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