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A New Environmentalism:

The Need for a Total Strategy for Environmental Protection

Scott Fulton and David Rejeski

What Has Changed?

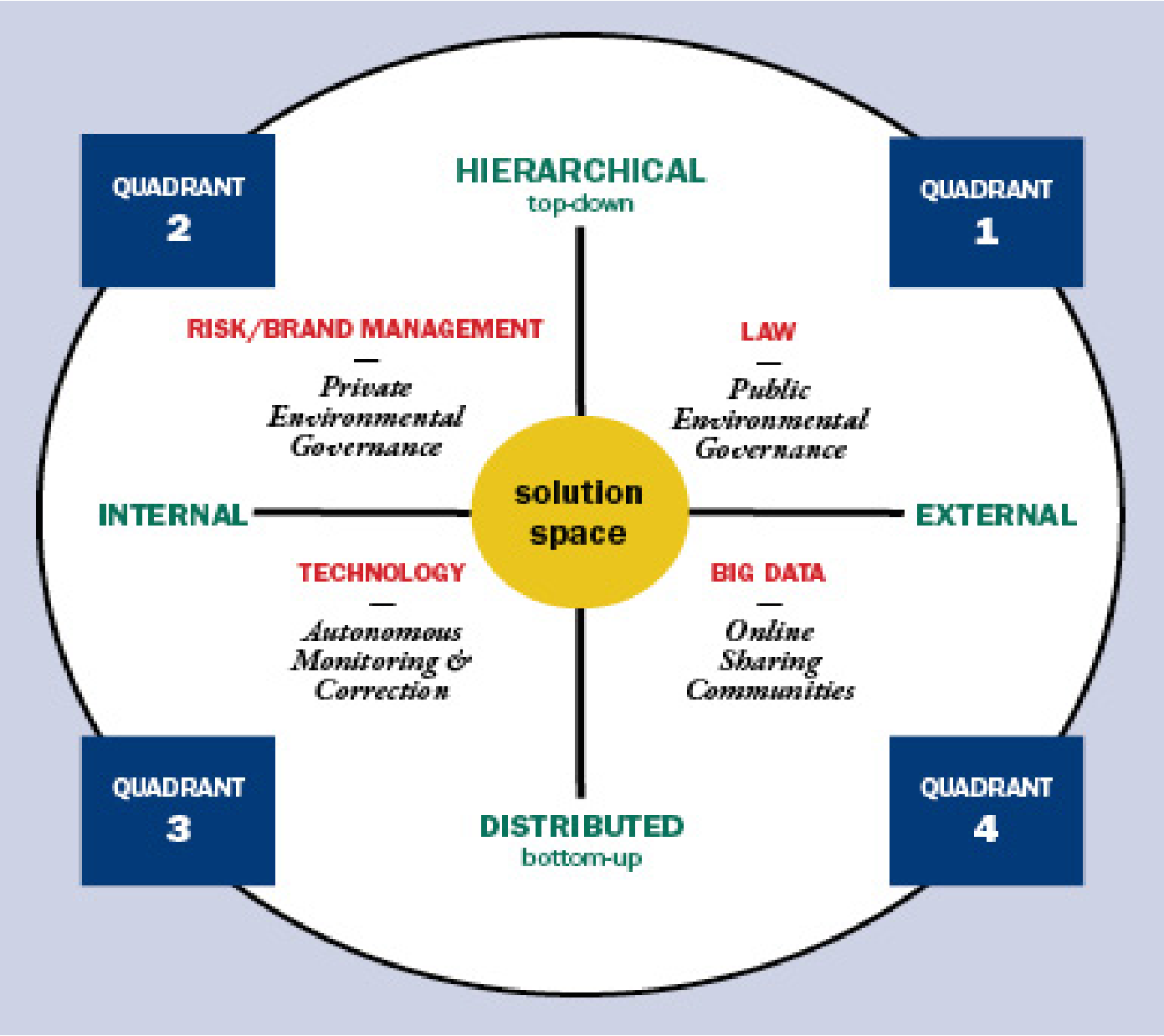
- Government composite
  - State progression
    - 35 year+ programs anchored in federal baselines
  - The rise of big cities
- Private sector orientation
- Technology
  - Control
  - Assessment and monitoring
  - Communication
- Knowledge base

What's Evolving?

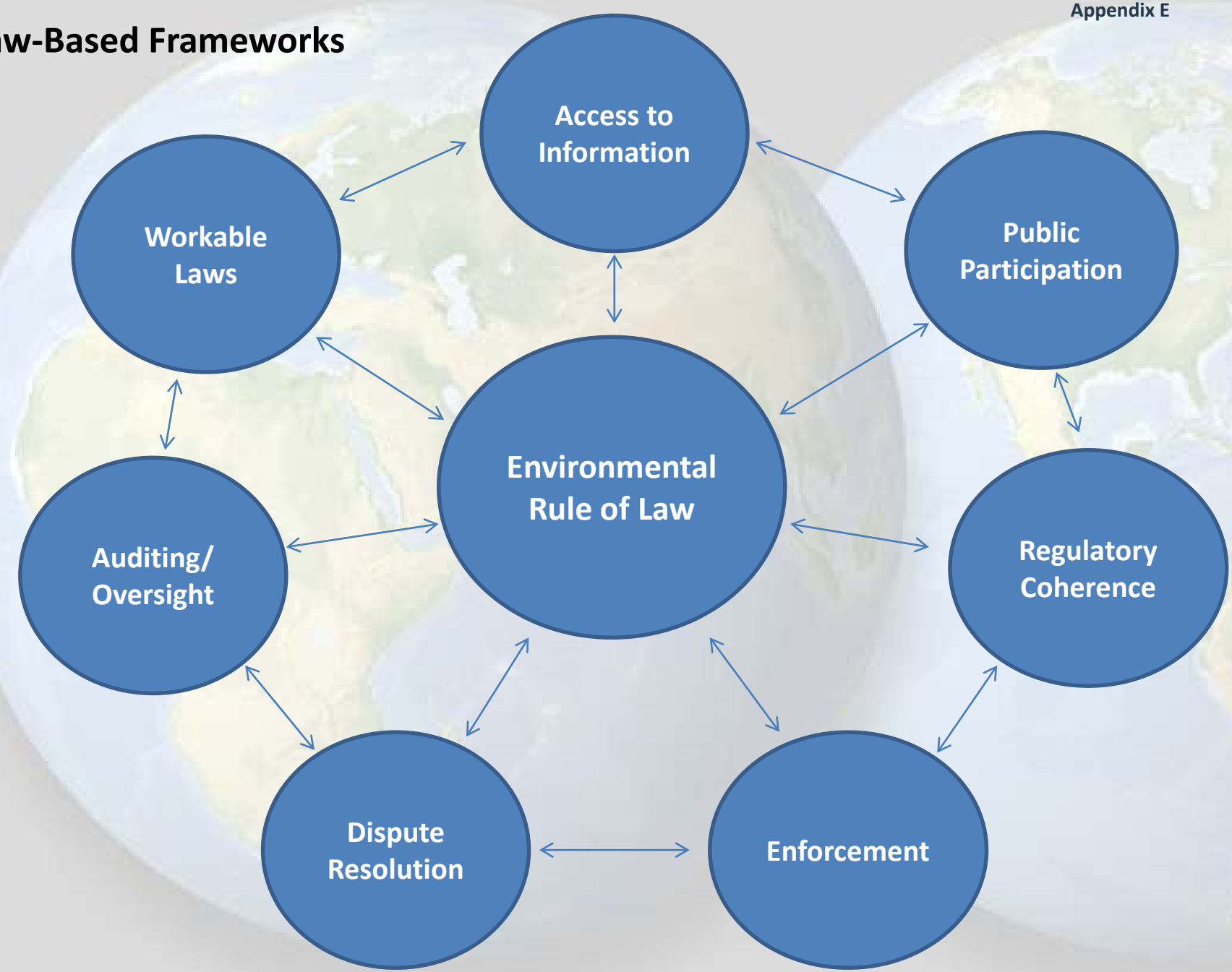
Moving towards environmental protection enterprise with increasingly distributed roles and accountability

- Big data driven
- Social media-reinforced
- With redefined, realigned and redistributed roles within government

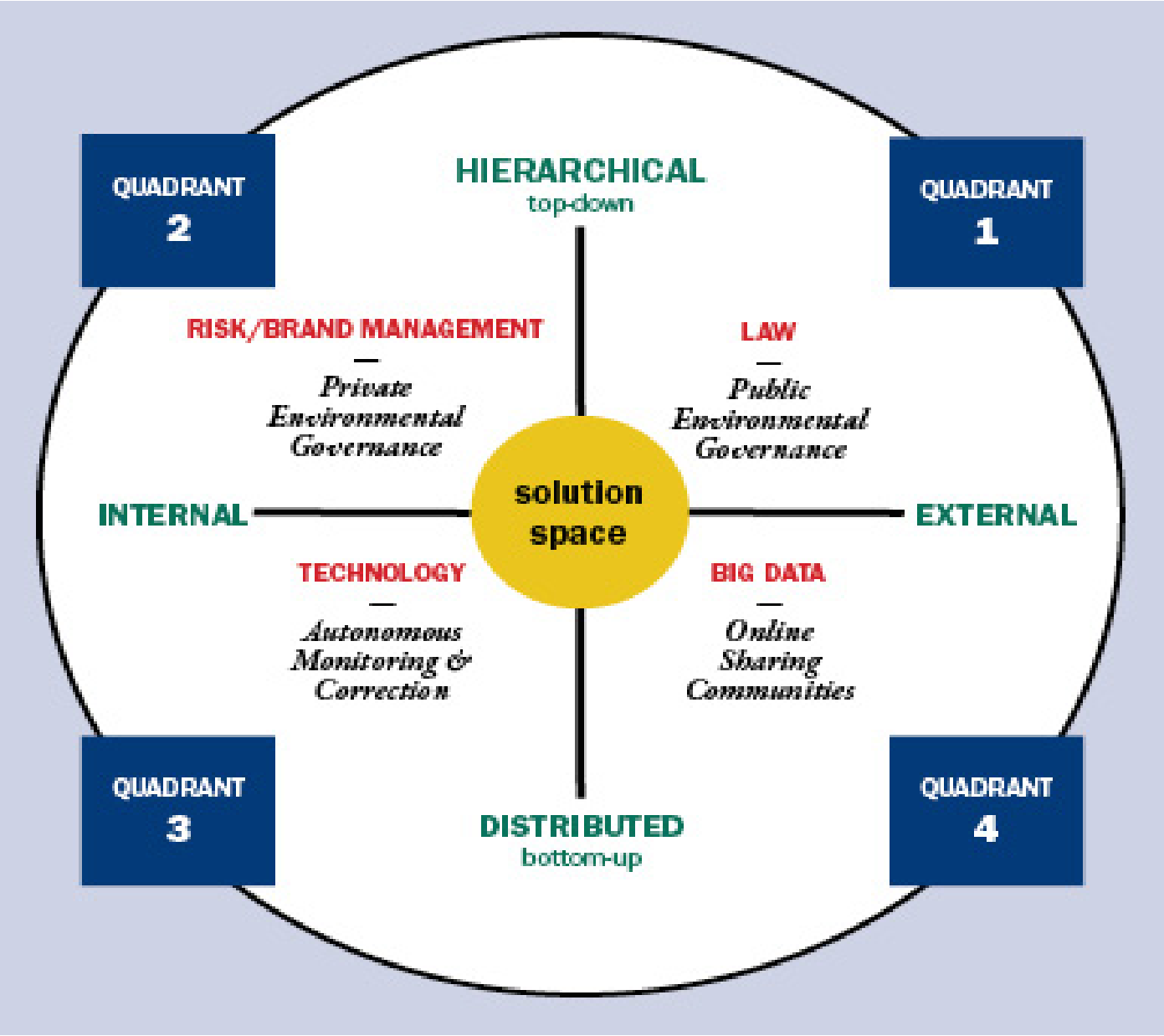
Ecosystem of Drivers and Governance Mechanisms



Law-Based Frameworks



Ecosystem of Drivers and Governance Mechanisms



Quadrant 2: Emergence of Private Environmental Governance

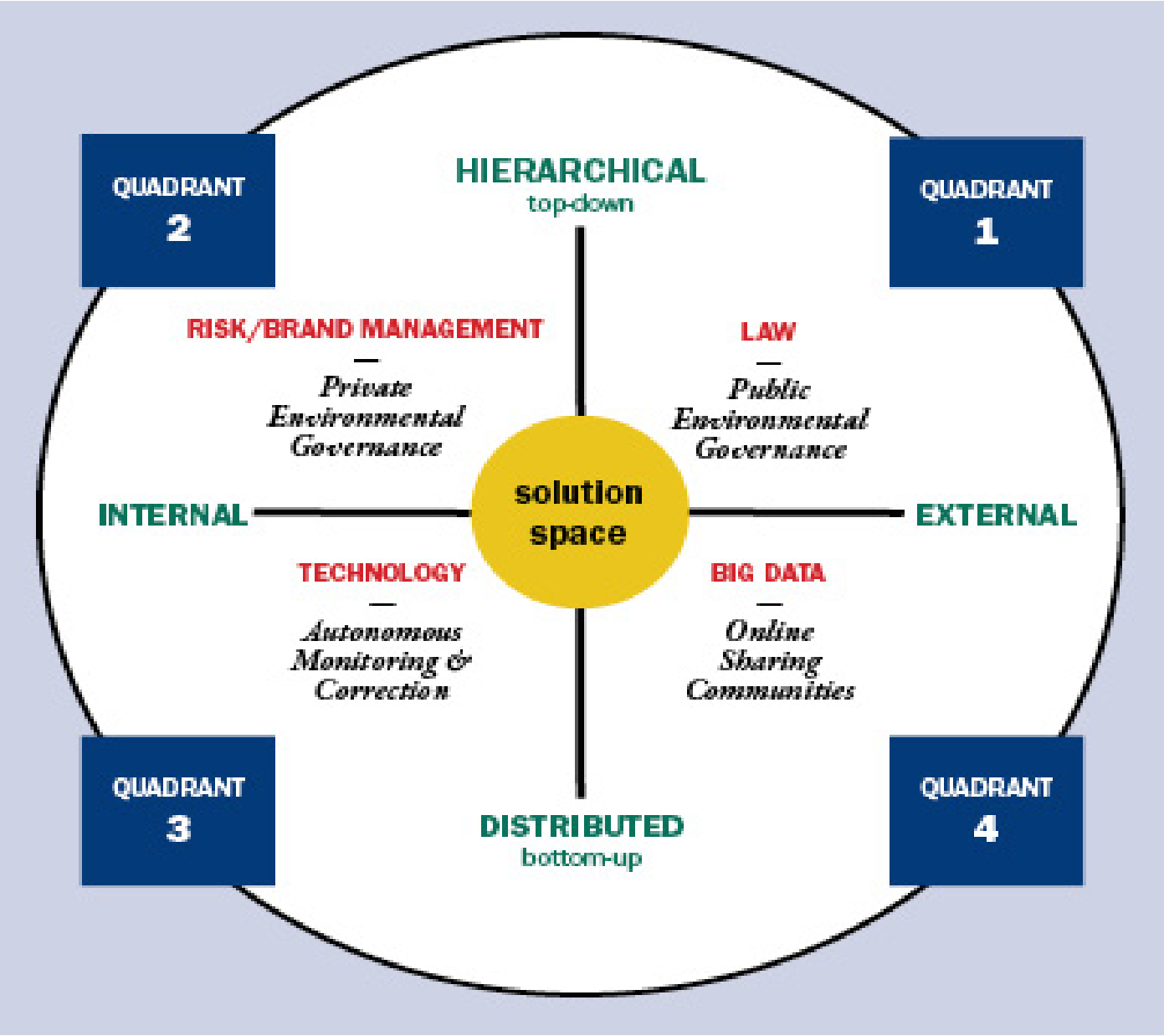
- Compliance culture
- Evolved, enculturated values
- Shareholder initiatives and demands
- Customer and supply chain manager requirements
- Investor, lender, insurer demands
- International regulation

Quadrant 2: Emergence of Private Environmental Governance

What most companies are increasingly about:

- Reputation and financial risk management
- Brand enhancement and protection
- "Regulating"
  - Internal operations
  - Supply chains

Ecosystem of Drivers and Governance Mechanisms

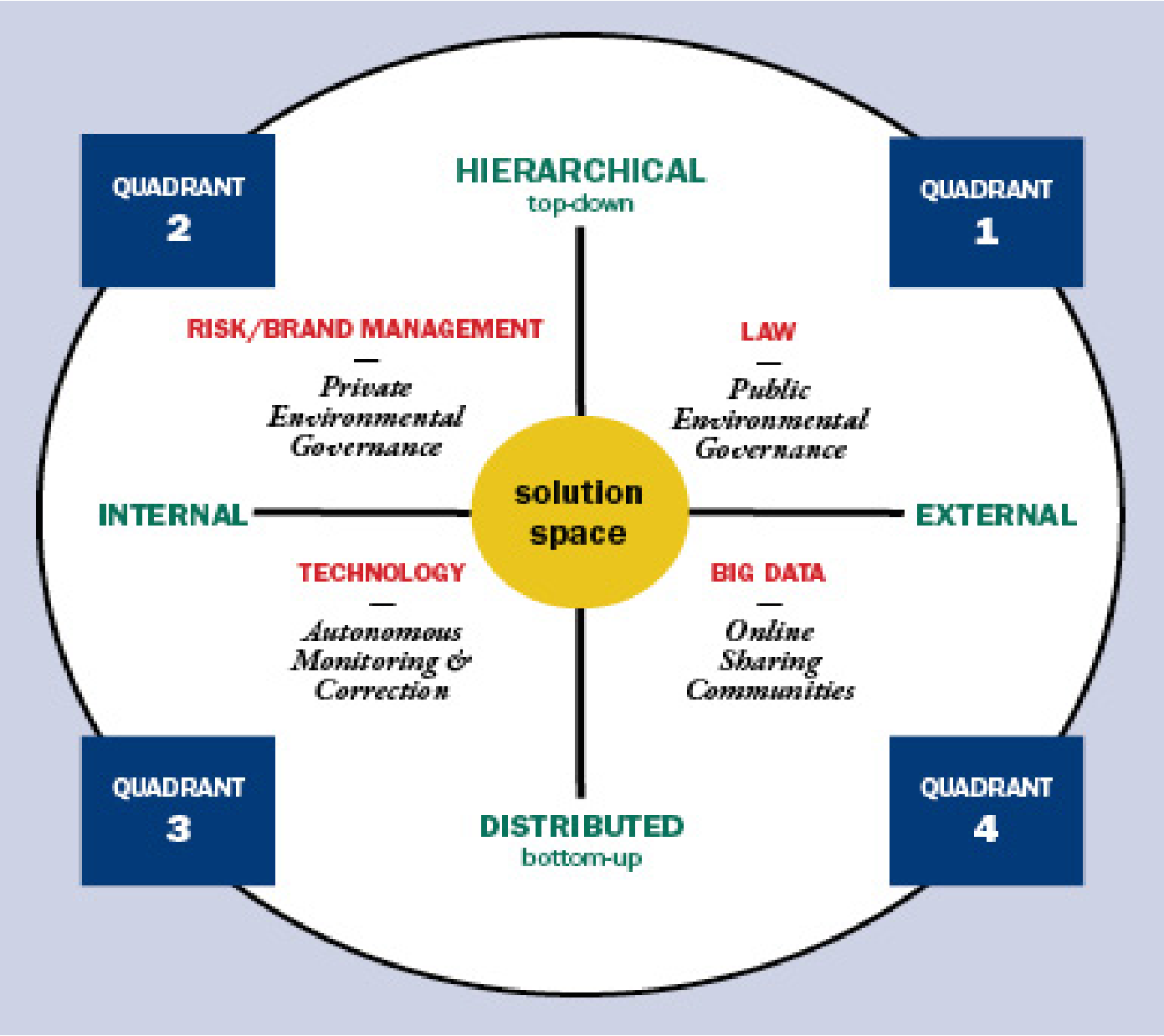


Quadrant 3: Autonomous Systems

Technology-enabled monitoring and adjustment/correction systems

- Enhanced sensor networks
- Algorithmic decisionmaking
- AI/machine learning

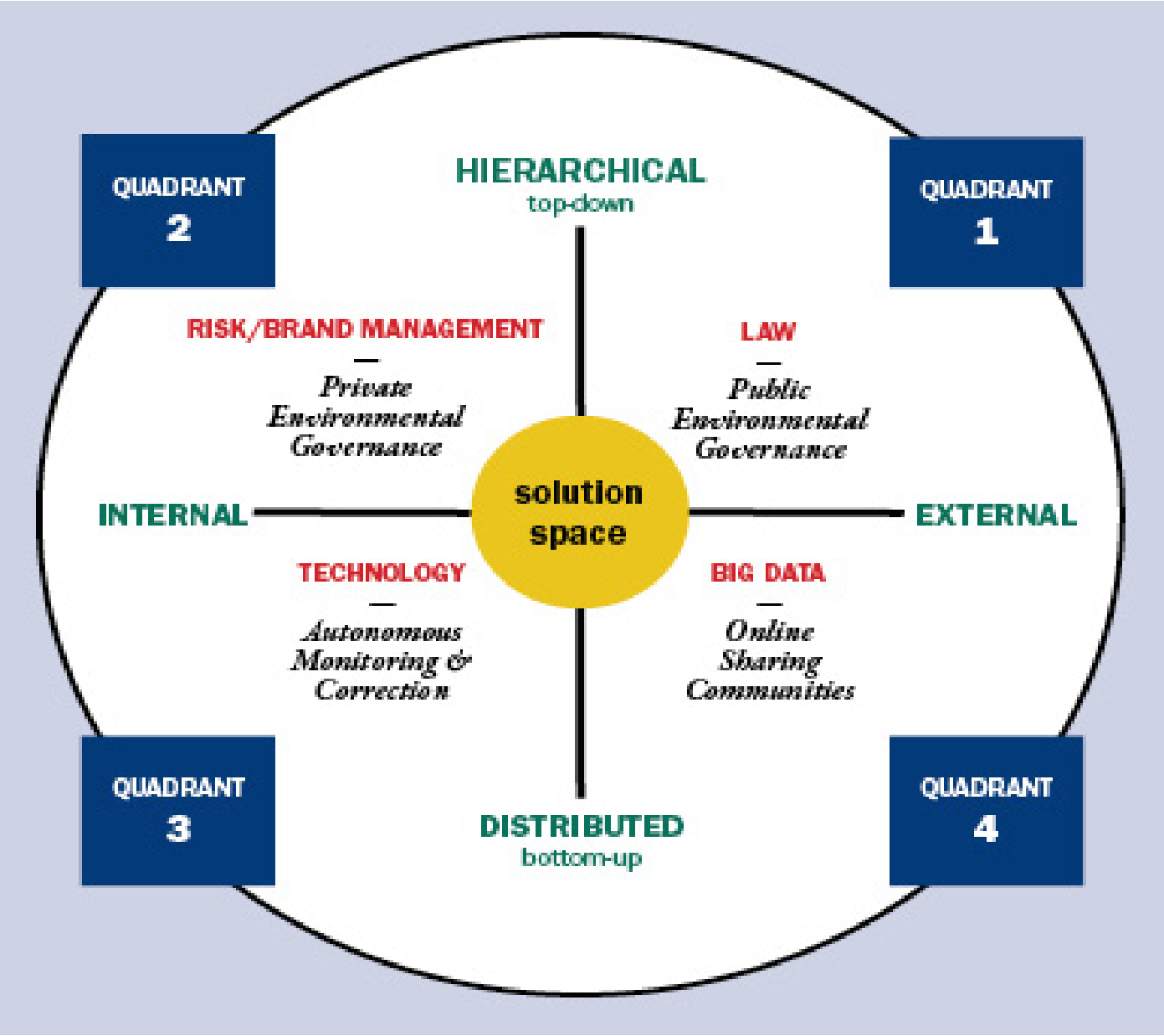
Ecosystem of Drivers and Governance Mechanisms



Quadrant 4: Data Driven On-Line Communities

- **Proliferation of low-cost sensor technology putting science in the hands of citizens**
- **Access to exploding amounts of environmental data from citizen monitoring, space and drone monitoring, etc.**
- **Growing capacity to integrate data streams to tell stories about source, fate and transport**
- **Growing capacity to share those stories through on-line communities in ways that shape behavior**
- **All of which is allowing citizens increasingly to engage**
  - As lay scientists
  - As consumers with teeth
  - As "police" and "judge" in the court of public opinion

Ecosystem of Drivers and Governance Mechanisms



Meaning for Purposes of Re-Imagining Environmental Law

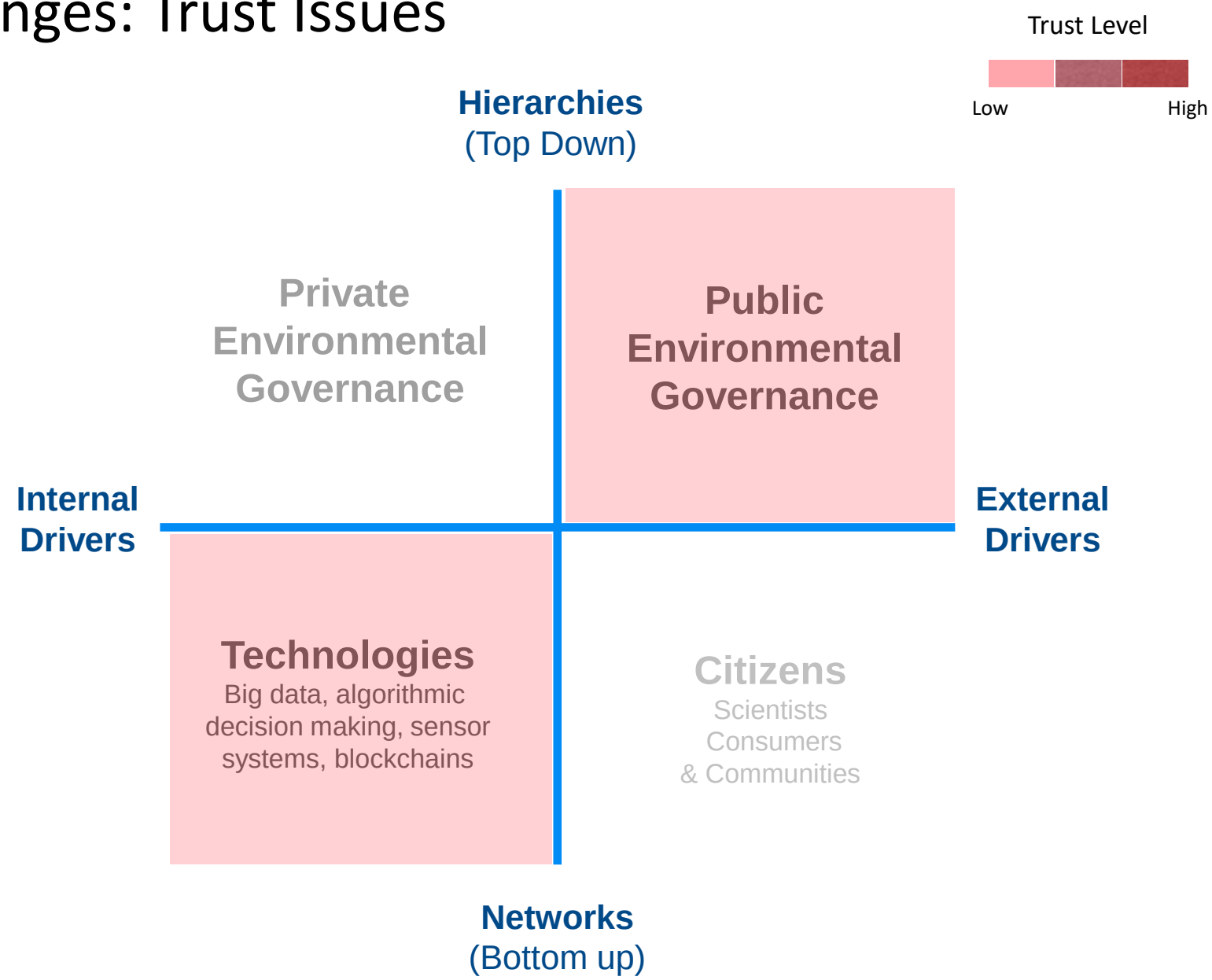
- **Environmental law needs to "stay in shape"**
- **Law needs grow in some new directions -- to accommodate other quadrants. Some examples:**
  - **Allow for and catalyze private sector parallelism**
    - **Market-based systems can work, in some cases without government stimulus**
  - **Ensure integrity in algorithm development – Need a "code for code"**
  - **Address privacy/access issues as well as abuse potential in big data/online community space**

Meaning for Purposes of Re-Imagining Environmental Law

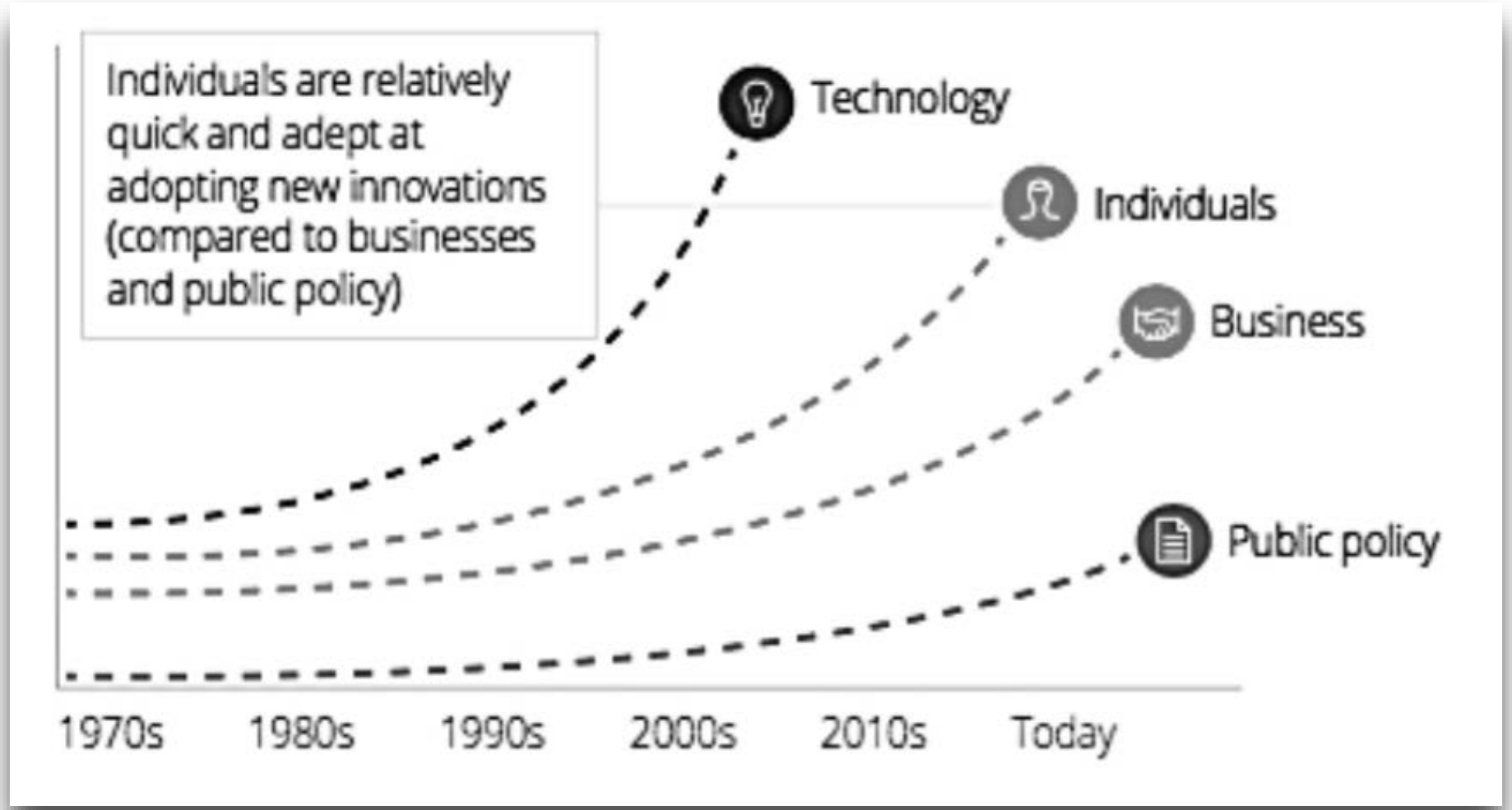
- **Lessons learned from Quadrant 1 should inform the architecture of the other quadrants**
  - **Importance of *transparency***
  - **Value of *stakeholder engagement* in framing normative expectations**
  - **Importance of *integrity* and *accountability systems***
  - **Value of challenge vehicles or *dispute resolution* mechanisms**
- **Architecture should be designed to:**
  - **Produce better decisions by allowing for input and subjecting decisions to testing**
  - **Cultivate buy-in and compliance through perceived fairness**

Appendix E

Challenges: Trust Issues



CHALLENGES: PACING PROBLEM

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Some Vehicles for Re-Imagined Law?

- "Soft law" mechanisms
  - Voluntary standards regimes with the teeth of market accountability
- Systematizing and normalizing supply chain management
  - Best practices in contracts and purchasing restrictions
- State and local lawmaking
- Sub-statutory lawmaking
- Case law
- Settlement practice
- Experimentation via
  - Negotiated rules
  - Enforcement Discretion