

Digital DNA: Disruption and the Challenges for Global Governance

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DIGITAL DNA

**DISRUPTION
AND THE CHALLENGES
FOR GLOBAL GOVERNANCE**

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Digital DNA: Disruption and the Challenges for Global Governance

A Presentation at ITIF
by

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Four Big Takeaways

- **World economy and Digital DNA** -- change how innovation and business models work even in traditional sectors
- **Policy and political economic challenges** -- Cloud ecosystem, digital privacy, and cyber security: market access requires a trusted digital environment
- **Core “club” of nations** -- forging global governance regime aligning values for trusted digital environment and market integration
- **Soft law** -- setting fundamental enforceable principles and delegating to multi-stakeholder organizations accountable to governments

Information and Production Disruption (IPD) and Innovation

- Information Disruption:
 - Much lower IT costs (Moore's law and the Cloud)
 - Broadband networking and mobility
 - Modularity of IT designs (mix and match easier)
 - Machine learning/AI
 - Open source software inputs
- Production Disruption:
 - Additive (3D) manufacturing, smart materials, sensors, and robotics heavily driven by IT resources
- Interaction of production and information -- Internet of Things

Digital Technology Becoming Pervasive

- Alters value added and competitive advantages of *all* goods and services
- Sustains high value/high wage in U.S. manufacturing and commodity industries
- Blurs lines between goods/services or high/low tech
- Lowers the cost of innovation and successful entry
- Influences rate of productivity growth and ability to innovate

25% of MFG Value Added is Digital— Even household key making is digital



Digital, not Mechanical, Engineering is Key

- Microsoft and Halliburton announced a deal to provide machine learning, augmented reality, and internet of things technology for the oil and gas industry.



Agriculture:

Iowa AgriTech Accelerator's Prizes

- WISRAN: Software as a service platform increases efficiency of farming operation by improving worker productivity and agricultural machinery logistics. (Sunnyvale, CA)
- Phenomics Labs: Portable growing labs with inexpensive data-collection sensors and cameras that test experiments (Burnsville, MN)
- FarrPro: Efficient, effective piglet heating solutions (Iowa City, IA)
- Rabbit Tractors: Miniature farm equipment. (Ann Arbor, MI)

Phenomics Labs: Plant Breeding

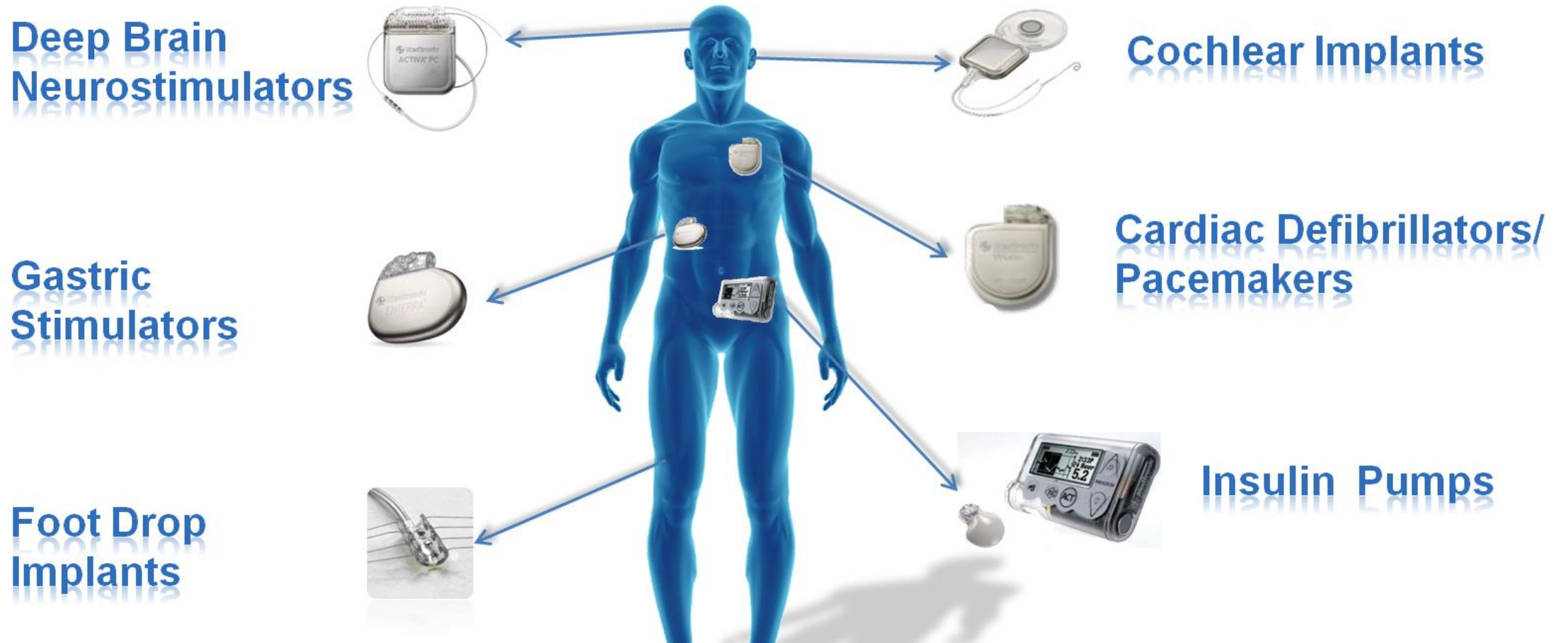


Digital Cotton Quality

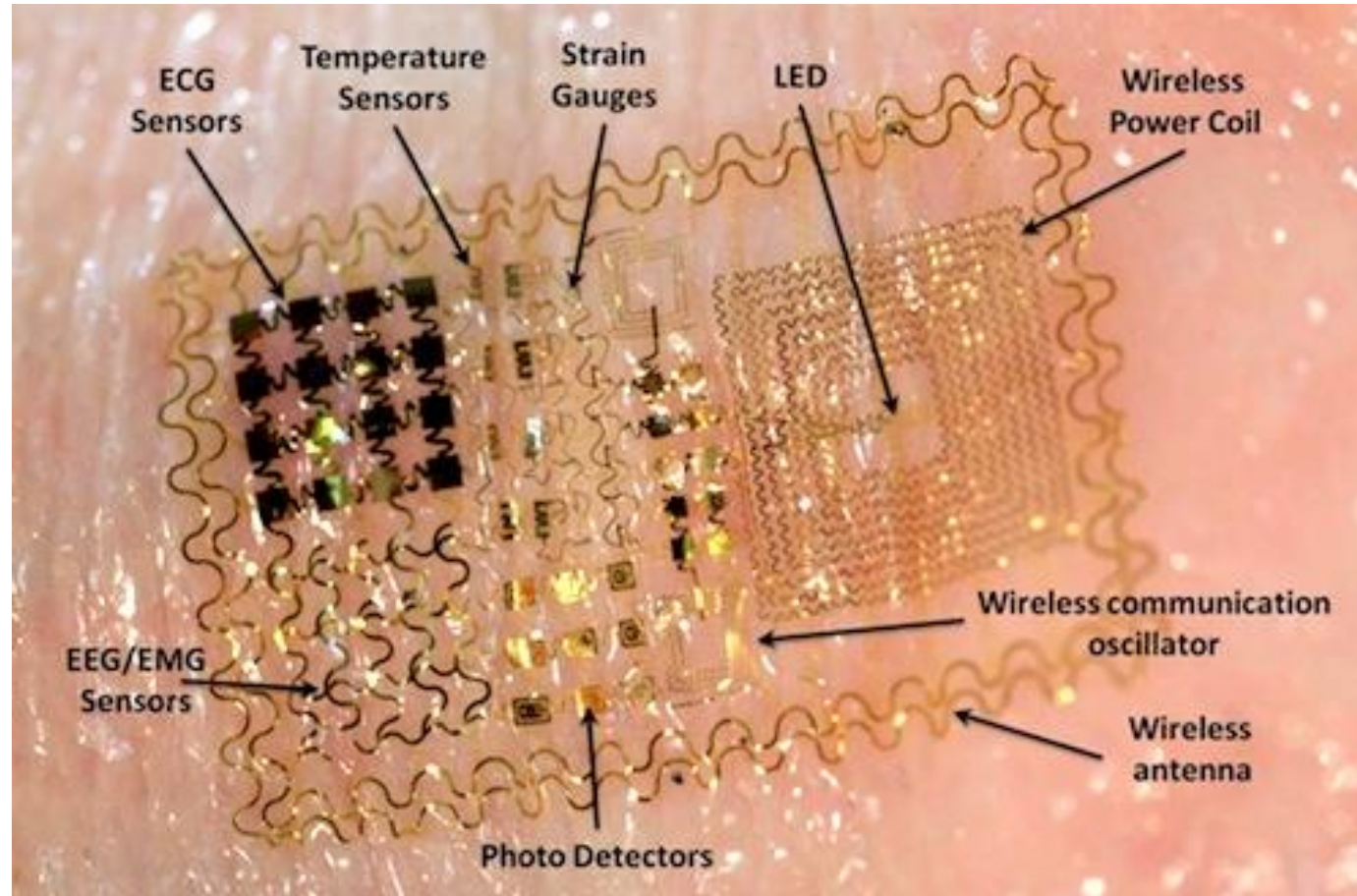


Medicine

New Classes of Novel Networked Products



Medical sensor tattoos combined with stretchable batteries



Strategies to Implement a Regime for Digital DNA

- Build global governance “club” through piecemeal reforms
- Recognize market access and competition goals are interrelated to progress on creating a trusted digital environment
- Honor diversity in national policy mixes but establish authoritative international baseline of enforceable “hard” and “soft” rules to achieve quasi-harmonization of national policy regimes

A Powerful Global “Club” can be Formed to Anchor Digital DNA Governance

- Global economic power has dispersed, but a “club” of NAFTA/EU/ Asian allies still will have ~40% of GDP in 2020 -- more than China and India combined
- The Club’s ICT market power is even greater despite China’s key role in tech market plans of global players
- TPP negotiations began this work. Can reboot with NAFTA and follow up negotiations.

Global Governance Precedents

- WTO evolved into partial framework for services by 2008
- Trade rules imperfect, but disciplined national regulatory regimes and allowed for more predictable market rules and cross-border commerce
- Binding soft rules of WTO Basic Telecommunications Agreement show how trade can induce, and hold accountable, quasi-harmonization of national regulations
- Trade arrangements began to accommodate MSOs in governance through roles for technical standard safety and food safety

Principles to Guide a Global Governance Regime

- A regime tries to build consensus on:
 - Principles: a theory of cause and effect on how to move forward
 - Norms: widely shared expectations of acceptable behavior
 - Specific rules: to translate principles and norms into obligations
 - Identifiable decision-making and implementation arrangements
 - Enforcement mechanism is a key issue

Principles to Guide a Global Governance Regime

Digital DNA requires FACE governance principles emphasizing:

Flexibility to adjust to rapid changes, blurring of traditional categories

Accountability and subsidiarity in governance mechanisms

Complementary governance arrangements -- share work between government authorities and MSOs -- knowing problems will arise

Experimental problem solving -- embrace bottom up MSO inputs builds reputational and network effects

Why FACE is necessary: The Complexities of Addressing Digital Privacy

- Distinguish civilian (or firm) to civilian privacy protection from privacy protection between governments and citizens
- Hard for market to provide appropriate levels of privacy protection
 - Personal information has collective goods properties -- infinitely reusable and hard for individuals to value appropriately
 - Absence of clear property rights for private information
 - Privacy is intertwined with digital security
- Government remedies have risks
 - Individuals can benefit from sharing of personal information -- reputation
 - Regulations imposes costs on societies as a whole -- cost of EU regulations making its economy less data intensive?
 - Regulations may block evolution of some market driven solutions

Why market will not solve cyber security

- IPD technology curve advantages attackers because IT growing more pervasive, software language vulnerable when new and quickly reused, and no system is “human proof”
- Offense easier and cheaper than defense—private market for attack tools, attribution hard, timely detection often hard, and imperfect info sharing among those subject to attack
- Incentives not aligned for defense—“market for lemons” (how much to invest in defense) and externalities in defense (defend more than just your domain)

Complexities of Cloud Eco-system

- Three different business models for services often muddled in policy debates -- infrastructure, platform, and software – but they have different competition dynamics
- Global hub-and-spoke provides economies of scale/scope, cross-border data applications, redundancy for reliability, and peak load management: perhaps heading to model like autos in 1960s
- Cloud data can be stored according to customized security and privacy rules
- Global network makes extraterritorial jurisdiction tricky

Six Market Access Rules: Minimum Agenda

1. Grant freedom to choose location of cloud ecosystem infrastructure for services and right of foreign firms to provide a service by accessing their own business data across national borders.
 - Freedom of cross-border information flows
 - Freedom of suppliers to locate infrastructure without local presence requirements
2. Ban discrimination against electronic delivery of services, including software and quantitative limits on number or volume of services delivered.
 - Permit cross-border payments for services, with prudential regulation

Six Market Access Rules: Minimum Agenda

3. Recognize right of customers to use extraterritorial suppliers of services via public telecommunications networks. Government policy should respect technological neutrality in delivery and technical organization of service.
4. Recognize use of international standards for encryption technology and right of firms to use encryption for commercial purposes if they qualify as “data controllers” within rules on a trusted digital environment.

Six Market Access Rules: Minimum Agenda

5. Build on the 2015 WTO International Technology Agreement (ITA) to add more industries.
 - Spread of digital platforms makes more industries ripe for coverage (e.g., wireless health devices)
6. Negotiate highest possible liberalization standards for products that cross traditional goods/services boundaries.
 - Allow smaller firms to produce and then ship specialized manufactured products produced by 3D printers across national boundaries either as physical products or digital files

A “Trusted Digital Environment” can be supported by Trade Rules

1. Expand “horizontal” trade disciplines for domestic regulations of digital services and goods.
 - Transparent administrative rule making and timely, objective criteria
 - Nondiscrimination among member country firms based on national origin
 - Technologically-neutral policies
 - Policies that are “least burdensome to trade.”

Trusted Digital Environment

2. Quasi-convergence of national regulations, based on common framework of trade principles and norms to address market access and new issues of digital privacy and security.
 - Binding “hard” rules: e.g., governments cannot demand firm’s software source code to gain market entry
 - Binding “soft rules” require embrace of policy capabilities that frame national rules:
 - Specify commitments to making and enforcing rules for achieve agreed-on purposes
 - E.g., agree to use risk management principle to guide cyber security regulations
 - Nations choose specific mechanisms/policies if they fulfill intent of the obligation

Soft Law for a Trusted Digital Environment

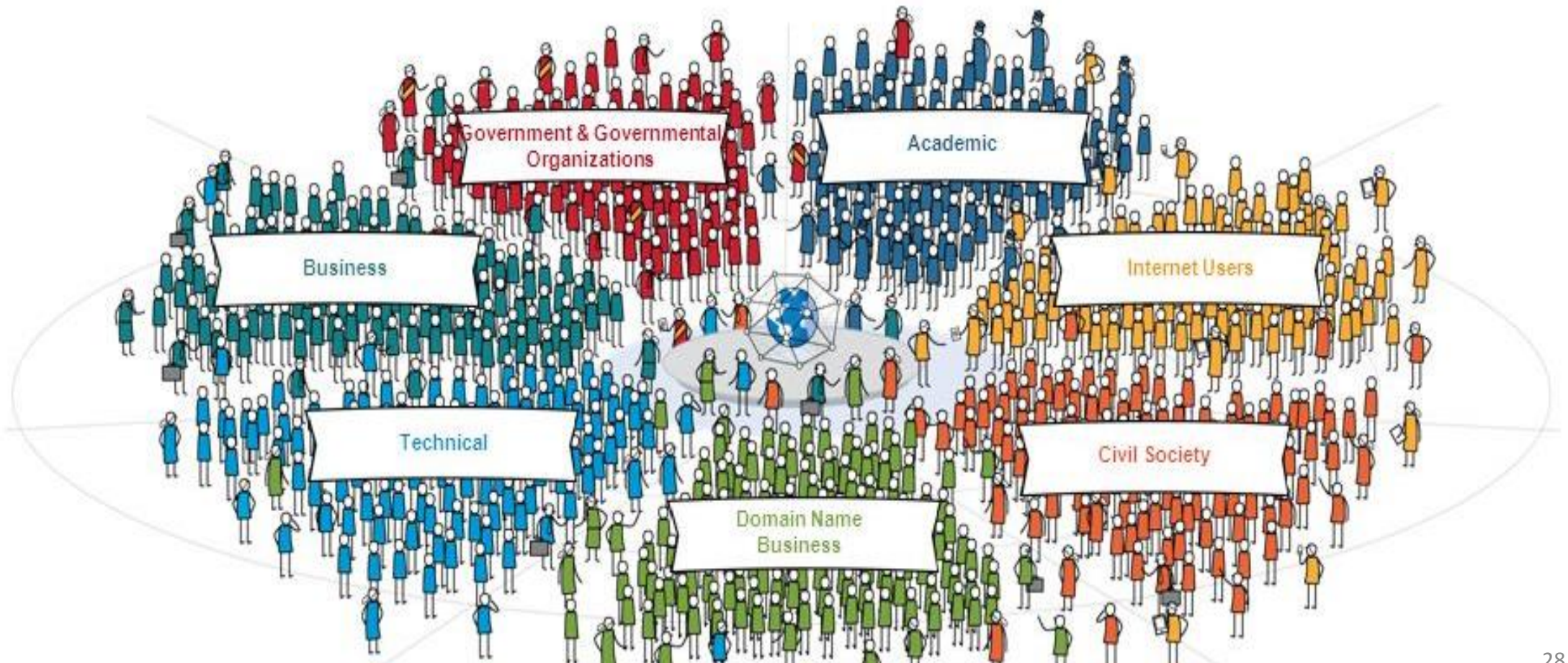
- System will evolve over time -- no single perfect fix
- Principles should allow room for national customization
- Combine national regulatory reciprocity within trade enforcement to enforce principles -- regulators part of regime enforcement mechanism

Trusted Digital Environment

3. Work through Multi-Stakeholder Organizations (MSOs) that
 - Public-private partnerships incorporate civil society organizations to improve governance but are subject to government oversight
 - use soft rules to outline conditions about operation and membership of recognized MSOs (e.g., ICANN or SWIFT)
 - e.g., determine how firms comply with government digital privacy and security

ICANN's Global Multistakeholder Community

community is a community of communities comprised of people and organizations.



Multi-stakeholder Organizations

- Coordinate problem-solving between national-level regulators and trans-border economic and technological flows
- MSOs could help turn privacy and security soft rules into marketplace norms and certifications of behavior (read the book for details!)
 - Privacy code could meld OECD and APEC privacy codes
 - Security code could use frameworks like those of NIST
- MSOs subject to national regulatory scrutiny and collective international mechanisms

SWIFT -- a MSO reporting to Central Banks for cross-border payments between banks

- SWIFT's organization and governance:
 - Headquartered in Belgium, its international governance and oversight reinforces neutrality & global structure
 - Private shareholders elect Board composed of 25 independent directors
 - Overseen by Central Bank of Belgium and Bank of International Settlements

Trusted Digital Environment

4. Reciprocity needed to create a trusted digital environment.
 - Feature “conditional most-favored-nation” clauses for trusted digital environment commitments, so only signatories benefit
 - Privacy and security challenges will require interpreting soft rules through the MSO process
 - Only companies headquartered in countries that sign onto rules should benefit in MSO process

Does Any of This Matter Under President Trump?

- Information & Communication market is huge: US is world leader in the \$4 trillion world market
- Advancing Trump's economic priorities – Manufacturing and commodities industries require IPD to be competitive with good wages
- Trade agreements after TPP – organ transplants valuable after death
- Use NAFTA revisions as first trade building block
- Bilateral regulatory agreements can complement

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