Disrupt or be Disrupted: Research Findings from the CDO Project & Policy Questions

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CDO Overarching Questions

- How can Canada best respond to the challenges posed by a rapidly changing digital landscape, while benefiting from emerging opportunities to promote our economic prosperity?
- How can we situate Canada's digital opportunity in a global context in order to frame policy that strengthens our international competitiveness and contributes to a broader public debate?
- How can we identify where the greatest opportunities and risks lie and propose the most effective policies to secure the future prosperity of Canadians.

Research Questions I

- ***Research Area 1: Canada's Position in Global Production Networks***
  - **What is Canada's relative position in global production networks and what are the niches in which Canadian IT firms enjoy competitive strengths?**
  - How do successful Canadian ICT firms currently position themselves in GPNs and GINs and what factors are likely to make Canada the location of choice for domestic and global firms?
- ***Research Area 2: The Local Context for Global Networks***
  - **What is the role of local conditions in supporting the competitiveness of IT firms in Canada? How does the local context support the process of new firm formation and firm growth in the IT sector?**
    - What are the factors that most effectively shape a local context that is attractive to GPNs and GINs and are conducive to the growth of digital firms in Canada? How can these factors be shaped to help grow Canadian firms to global scale?
    - To what extent are local education and training systems across the country positioned to meet the future demand for digital skills and how can they be improved to support the growth and competiveness of Canadian firms?

Research Questions II

- ***Research Area 3: Diffusion of Digital Technology across the Economy***
  - **How does the diffusion of digital technology across all industrial sectors affect Canada's transition to a digital economy and contribute to the overall competitiveness of the economy?**
    - How effectively are industries in the resource, manufacturing, service sectors in Canada adopting and deploying new digital technologies and media applications? What opportunities, both global and domestic, is this creating for domestic suppliers of digital products and services?
    - What are the new ICT platforms that are creating new opportunities across the economy in terms of cloud computing, big data, additive manufacturing?
- ***Research Area 4: The Role of Digital Infrastructure in Building Intelligent Communities***
  - **How effectively is digital infrastructure contributing to smart communities in all regions of Canada and the performance of the digital economy more broadly?**
    - To what extent are Canadian communities using digital infrastructure to become intelligent communities, to create digital opportunities for all citizens?
    - What measures could bolster their success in becoming intelligent communities?

Rise of the Platform Economy

- Digital technology at stage of “foundational technology”
  - Brian Arthur forecasts spread of the second “neural” economy
    - Third morphing of digital era – cheap & ubiquitous sensors
    - Internet of Things
    - Introduction of 5G networks – comparable to Internet pre & post 1992 (www)
  - Embedding of hardware functionality in software
    - Growing importance of “intangible capital” – IP, software, standards, data
- Platforms scale more efficiently than pipelines
  - Due to network effects - driven by:
    - Proliferation of mobile devices – 2007 is inflection point
    - Increased networking & bandwidth – cloud computing
    - Growing adaptability of software – easy to reprogram
    - Data analytics – Machine learning & reinforcement learning

Theme 1: GPNs in East Asia

- Some evidence of Canadian firms moving to Asia
  - Adopt followership model – several SMEs moving together
  - Shared talent, supply chains, business opportunities
  - Hyper-global firms from CanAsia Map are all digital
- Opportunities for Canadian Firms
  - Transition to software
  - Canadian R&D
- Challenges for Canadian Firms
  - Relatively closed networks
  - Canadian firms need to displace existing suppliers in networks
  - Patience and local know-how
- Govt policy needs to adapt to the followership model
  - But still have limited number of scaling firms (see below)

Theme 2: Agents & Assets in the Local Economy

- Critical role of the presence of local agents
  - Anchor firms, dynamic start-ups, serial entrepreneurs, civic associations & innovation intermediaries
  - Support networks of mentorship, knowledge exchange & learning
- Critical role of local assets
  - Strong base of highly skilled talent, research infrastructure, unique place-based characteristics
- Role of Anchor Firms
  - Too few domestic or indigenous firms
  - Challenge of scaling domestic digital firms remains critical
- Role of collective commons/shared assets
  - Not often well understood, but common feature of local context

Theme 3: Impact Across Economy

- Nothing left untouched by rise of platform economy
  - Rapid diffusion of digital technologies across all sectors of economy
  - Primary industries – agriculture, mining, oil & gas
    - Increasing adoption of digital technologies – sourced outside
  - Advanced manufacturing & materials science
    - Adoption of 3D printing & related digital technologies
  - Transportation industries – emerging model of TaaS
    - Growing integration of ICTs into autos – transition to TaaS
  - Fashion & Design going digital
  - Creative & Cultural industries
    - Disruptive impact of platform firms– governance is adrift
  - KIBS, financial services, blockchain – all being disrupted

Theme 4: Smart cities & Digital Inclusion

- Economic benefits of digital disruption unevenly distributed across cities & regions
  - Challenge of ‘digital underdogs’
  - Platform firms pose distinct challenges for urban governance
  - Rural & remote regions face greater challenges
- Problem of governance
  - Limited capacity at urban scale to cope with digital challenges
  - Weak local capacity intersects with public policy gaps
  - Need for coordinated national action
- Competing perspectives on ‘smart cities’
  - Visible gap between citizens & administrators
- Visible benefits of digital transformation concentrated in a few high tech centres
  - Poses major challenge of policy response for the rest

Key Challenges for Digital Economy

- Growing gap between ICT enabled firms & the rest:
  - 100 global frontier firms are more productive, more capital & patent-intensive (intangible) & have larger sales & profits – growing gap with the rest
- Challenges for small open trading economy are same as identified in 1980s:
  - Need to export & trade in high technology products to grow
  - Lack of large oligopolistic domestic firms
  - Inability to scale
  - Plus capital markets not geared to financing technology firms
- Greater challenges greater for digital underdogs, rural & remote

Policy Implications for Canada

- Have analyzed the policy implications in my IRPP issues paper circulated for the meeting
- But the challenge is what do the rest of you think about:
  - The need to scale?
  - The need to fund disruptive new technologies?
    - what BCG calls *The Deep Tech Ecosystem*
  - Our inability to mobilize existing capital pools to support domestic scale-up firms & keep them in Canada?
  - The challenges of keeping Canadian talent in Canada?
  - The need to support IP and data management strategies?
  - The need to diffuse digital technologies across the economy
  - The need to share benefits in all regions & communities

Creating Digital Opportunity Research Project

- Thanks to SSHRC & the CDO partners for making this possible
- All network presentations & papers available on CDO website:
  - https://munkschool.utoronto.ca/ipl/creating-digital-opportunity/