AI Policy Workshop - IAP 2020
(STS.S91/16.S498)
Economy and society - Now built on data
General policy goals

Economic growth  Societal benefits  Environment
Headwinds
Poverty and income inequality
Trade conflicts
Jobs / reskilling workers
Aging populations

Technology to achieve policy goals
Technology advancing rapidly

AI applications

Computation & cloud

Wireless
Regular visits from global policy makers

- How can they position their economies/countries to benefit from AI?
- Domestic vs international AI strategies
Countries to MIT:
“What should we do?”
Missing: AI policy framework & data to evaluate
Why measure?

1. Identify strengths and weaknesses
2. Incentive to improve processes
3. Gauge success of actions over time
1. Needs (Framework)
2. Levers - (Policy action)
3. Measurement (Indicators)
Examples of frameworks and data that have driven policy
Example: Human Development Index (UNDP)

The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone.

Components

- Life expectancy
- Expected years of schooling
- Mean years of schooling
- GNI per capita

<table>
<thead>
<tr>
<th>HDI rank</th>
<th>Value 2018</th>
<th>Life expectancy at birth (years) 2018</th>
<th>Expected years of schooling (years) 2016*</th>
<th>Mean years of schooling (years) 2018</th>
<th>Gross national income (GNI) per capita (2011 PPP $)</th>
<th>GNI per capita rank minus HDI rank</th>
<th>HDI rank</th>
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<tbody>
<tr>
<td><strong>VERY HIGH HUMAN DEVELOPMENT</strong></td>
<td></td>
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<td>1 Norway</td>
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<td>56,140</td>
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</table>
Example: OECD mobile price baskets

Goal is to compare the same set of services across a set of countries. Operators from all countries meet every few years to adjust the components in the basket based on their domestic usage patterns.

Components

- Voice call prices (by time of day)
- SMS prices
- Data prices

<table>
<thead>
<tr>
<th>Basket</th>
<th>Voice calls</th>
<th>SMS</th>
<th>Data (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 calls, no data</td>
<td>30</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>100 calls, no data</td>
<td>100</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>30 calls, 0.1 GB</td>
<td>30</td>
<td>20</td>
<td>0.1</td>
</tr>
<tr>
<td>100 calls, 0.5 GB</td>
<td>100</td>
<td>40</td>
<td>0.5</td>
</tr>
<tr>
<td>300 calls, 1 GB</td>
<td>300</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>900 calls, 2 GB</td>
<td>900</td>
<td>160</td>
<td>2</td>
</tr>
<tr>
<td>Unlimited voice, 5 GB</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>5</td>
</tr>
<tr>
<td>30 calls, 0.5 GB</td>
<td>30</td>
<td>10</td>
<td>0.5</td>
</tr>
<tr>
<td>100 calls, 2 GB</td>
<td>100</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>300 calls, 5 GB</td>
<td>300</td>
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</tr>
<tr>
<td>900 calls, 10 GB</td>
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<td>80</td>
<td>10</td>
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<tr>
<td>Unlimited voice, 20 GB</td>
<td>Unlimited</td>
<td>Unlimited</td>
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</table>
Example: Corruption Perceptions Index

First launched in 1995 by Transparency International, the Corruption Perceptions Index has been credited with putting the issue of corruption on the international policy agenda.

Components

- Combined responses from 13 different surveys on the perception of corruption
- Must have 3 surveys for each country to be included.
Example: OECD broadband triple play bundles

Compared the price of triple play bundles across countries. Required a deep dive into the services offered.

Bell Canada to pay $10M fine for misleading ads

The Competition Bureau says Bell Canada must pay a $10-million fine after it employed misleading advertising suggesting its prices were lower than what customers actually paid.

The bureau said Bell had advertised a bundle for home phone, Internet and television services starting as low as $69.90 per month. However, the lowest possible price, including the mandatory fees, was $80.27, the competition bureau said.

A Bell spokesman said the telecom company disagrees with the decision but agreed to resolve the issue rather than going through a lengthy and costly legal challenge.
Example: OECD Broadband Rankings

Benchmarks to look at broadband availability and adoption.

Components

- DSL subscribers per 100 inhabitants
- Cable subscribers per 100 inhabitants
- Fiber subscribers per 100 inhabitants
- Other / Fixed wireless subscribers per 100 inhabitants
- Mobile data subscriptions per 100 inhabitants
Example: US News College Rankings

Started in 1983 and plays an oversized role in the college application process

- Outcomes (35%)
  - Graduation and retention rates (22%)
    - Historic (17.6)
    - Recent (4.4%)
  - Grad rate performance (6 years) (8%)
  - Social mobility / Pell grant graduation (5%)
- Faculty resources (20%)
  - Class size (8%)
  - Faculty salary (7%)
  - Faculty with highest degree (3%)
  - student-faculty ratio (1%)
  - portion of faculty who are full time (1%)
- Expert opinion (20%) - 4,815 academics (dropped HS school counselors recently)
- Financial resources (10%) - ave spending on instruction
- Student excellence (10%)
  - Standardized test scores (7.75%)
  - High-school standing (2.25%)
- Alumni giving (5%)

- Students
- Schools
- Employers
Key point: Index items become policy targets

- **Outcomes (35%)**
  - Graduation and retention rates (22%)
    - Historic (17.6)
    - Recent (4.4%)
  - Grad rate performance (6 years) (8%)
  - Social mobility / Pell grant graduation (5%)

- **Faculty resources (20%)**
  - Class size (8%)
  - Faculty salary (7%)
  - Faculty with highest degree (3%)
  - student-faculty ratio (1%)
  - portion of faculty who are full time (1%)

- **Expert opinion (20%)** - 4,815 academics (dropped HS school counselors recently)

- **Financial resources (10%)** - ave spending on instruction

- **Student excellence (10%)** -
  - Standardized test scores (7.75%)
  - High-school standing (2.25%)

- **Alumni giving (5%)**
Caution: Gaming the system

- **Outcomes (35%)**
  - Graduation and retention rates (22%) (Drop academic standards once students are in)
    - Historic (17.6)
    - Recent (4.4%)
  - Grad rate performance (6 years) (8%)
  - Social mobility / Pell grant graduation (5%) (Focus efforts on recruiting excellent but poor students)

- **Faculty resources (20%)**
  - Class size (8%)
  - Faculty salary (7%) (Big payoff because double counted here and in financial resources: 10+7% = 17%)
  - Faculty with highest degree (3%)
  - Student-faculty ratio (1%)
  - Portion of faculty who are full time (1%)

- **Expert opinion (20%)** - 4,815 academics (dropped HS school counselors recently) (Increase marketing spend)

- **Financial resources (10%)** - ave spending on instruction (Double counted if for teacher salaries)

- **Student excellence (10%)** -
  - Standardized test scores (7.75%) (Make SAT optional. Best scorers report. Lowest scorers don’t.)
  - High-school standing (2.25%)

- **Alumni giving (5%)** (Start a campaign asking everyone to contribute $1)
Potential policy framework for AI
Suggested framework approach

- Emphasis on sectors
- Decide on necessary:
  - 1. AI factors of production
  - 2. Market conditions for successful deployment
  - 3. Social well-being requirements
  - 4. Environmental requirements?
- Identify relevant policy levers
- Identify potential indicators/measurements with broad coverage and high availability
Example: Mapping tech needs to policy levers

Supervised model training

1.1. Training Data Sets
1.2. Algorithm Design
1.3. Training & Computation
1.4a. Model

New input

1.4b. Implementation

Needs
- Data creation
- Data collection
- Data labeling
- Data use

Govt Levers
- Privacy laws
- Security regulations
- Funding for data

Human expertise
- Education
- Computational thinking
- Local language content

Computational resources
- Funding research
- Data localization rules
- Tax cuts for R&D

New output

Entrepreneurship
- Human expertise
- Access to capital
- Reskilling workers

Skills
- Ease of business
- Govt ideas
- Reskilling

MIT Internet Policy Research Initiative
Massachusetts Institute of Technology
1: AI factors of production

2: Market implementation

3: Social benefits / protection

4: Environmental benefits / protection
AI factors of production

AI market conditions

AI social conditions

AI environmental conditions

Vietnam / Finance
Generic framework structure

1: AI factors of production
- 1.1: Data
- 1.2: Algorithms, Tools
- 1.3: Training, Computation, Models

2: Foundation for market implementation
(...)

3: Foundation for social benefits/protection
(...)

4: Foundation for environmental benefits/protection
(...)
Needs:
Data: Creation
Data: Collection
Data: Labeling
Data: Use
People: Human expertise
People: Reskilling workers
People: Local language content
Hardware: Computational resources
Market: Entrepreneurship
Market: Access to capital

Levers:
Privacy laws
Security regulations
Data localization rules
Education
Computational thinking
Local language content
Research and data funding
Ease of business
Tax cuts for R&D
Skills development
Reskilling

Data/Indicators:
TBD

1: AI factors of production
2: Market implementation
3: Social benefits / protection
4: Environmental benefits / protection

Framework items

Sectors

1.1 Data
1.2 Algos, Tools
1.3 Training, Compute

5.1 Transport
5.2 Finance
5.3 Health
5.4 Agriculture