Resiliency and Business Innovation

Building a Resilient Business Community: Before, During, and After a Disaster

A Course for Support Practitioners

Module C: Comparative Strategies, Energy, Digital Puerto Rico, Digital Marketing, Key Asset Protection

September 29, 2020 6:00pm-8:00pm

Linton Wells II, J.P. Auffret, Robert Rogers

Puerto Rico Science, Technology & Research Trust

Center for Resilient and Sustainable Communities

ECHAR PA'LANTE

*C-RASC consists of researchers from George Mason's Volgenau School of Engineering , the School of Business, the Schar School of Policy and Government, the Jimmy and Rosalyn Carter School of Peace and Conflict Resolution, the College of Science, and the College of Heath and Human Services

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Comparative Strategies of Resilience and Innovation

J.P. Auffret, Ph.D.

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Lin Wells, Ph.D.

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Bob Rogers

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HACOPRW

Resiliency and Business Innovation

Organized by the Puerto Rico Science, Technology & Research Trust and the Resiliency and Business Innovation Program Sponsored by the U.S. Economic Development Administration under the US Department of Commerce

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Course Outline

Module A Overview and Introduction (Tue, Sep 15, 6:00:8:00)
Lesson A: Puerto Rico, COVID-19 and Resilience; Helping Business Owners/Operators Get the Most from Their Course; Introduction to Resilience
Lesson 1: Introduction to Workbook & Facilitators, Baseline Survey

Module B Strategic Policy and Analysis Concepts (Tue, Sep 22, 6:00-8:00)
Lesson B: Strategy and Policy Aspects of Puerto Rican Resilience
Lesson 2: 5 Keys to Networking; Protection of People, Data, and Operations

Module C Comparative Strategies, Energy, Digital Puerto Rico, Digital Marketing, Key Asset Protection (Tue, Sep 29, 6:00-8:00)
Lesson C: Comparative Strategies of Resilience and Innovation, Energy Transformation, Digital Puerto Rico, Resiliency Innovation Network
Lesson 3: Digital Marketing for Resilience, Protection of Inventory, Equipment, and Buildings

Module D Integration and Wrap Up (Tue, Oct 6, 6:00-8:00)
Lesson D: Personal & Business Resilience, Micro-manufacture (M2), Advanced Agriculture, Building a Resilient Business, READI Framework
Lesson 4: Keys to Recovering Better, Complete Workbooks, Quiz, Wrap-up

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Building a Resilient Business: Before, During, and After a Disaster

Lesson C

Comparative Strategies of Resilience and Innovation, Energy Transformation, Digital Puerto Rico, Resiliency Innovation Network

Puerto Rico Science, Technology & Research Trust

Resiliency and Business Innovation

Center for Resilient and Sustainable Communities

Organized by the Puerto Rico Science, Technology & Research Trust

Sponsored by: U.S. Economic Development Administration

Sept 29, 2020, 6:00 PM- 8:00 PM

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Agenda

- Comparative Strategies for Resilience and Innovation
- Energy Transformation
- Break
- Digital Puerto Rico
- Lesson 3 – Digital Marketing for Resilience; Protection of Inventory, Equipment and Buildings (October 8th)

Social Media and Resilience – Bangkok Floods 2011

Source: http://www.bangkokpost.com/photo/photo/262533/splash-from-the-past

Source: http://www.nytimes.com/2011/11/07/business/global/07iht-floods07.html?_r=0

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Bangkok Flood and HDD Manufacturers 2011

Table 9
Damages to major HDD makers.
Source: Press release.

Company	Place of factories	Damage	State of operation /production
Western Digital	1) Bang Pa-in Industrial Estate 2) Nava Nakorn Industrial Estate	Factories inundated (2 m)	- Stopped production since Oct 16, 2011 - Partly restored on Nov 30, 2011 - Needed days to restore:46 days
Toshiba	Nava Nakorn Industrial Estate	Factory was inundated (1 m)	- Stopped production since Oct 11, 2011 - Alternate production in Philippines - Partly restored Thai factory on Feb 1, 2012 - Need dates to restore: 114 days
Seagate Technology	1) Seagate Teparuk, Amphur Muang, Samutprakarn Province 2) Seagate Korat, Amphur Sungnoen, Nakhon-Ratchasima	Factories were not inundated	- Some adjusted production due to the lack of supply from suppliers
Samsung	In South Korea	Factories were not inundated	- Some adjusted production due to the lack of supply from suppliers

Source: Haraguchi and Lall (2011)

Bangkok Flood and HDD Manufacturers 2011

Table 6
Impacts of the Thailand floods on Japanese major automakers.
Source: Press release of each companies.

Statistics	Toyota	Honda	Nissan
Number of lost cars at global due to Thailand floods (thousand cars)	240	150	33
Operating profit (billion yen)	270 ($3.4B)[a]	200 ($2.5B)	510 ($6.4B)
Lost operating profit due to Thailand floods (billion yen)	100 ($1.25B)	110 ($1.4B)	5.9 ($0.07B)
Percentage of loss of operating profit caused by Thailand flood to operating profit	37.04%	55.00%	1.16%
Operating Profit (% compared to 2020)	−42.30%	−64.90%	−4.70%
Net profit (billion yen)	200 ($2.5B)	215 ($2.7B)	290 ($3.6)
Net profit (% compared to 2010)	−57.50%	−59.70%	−9%

[a] The exchange rate was used for 80 Japanese yen for 1 U.S. dollars, which was the rate at that time.

Source: Haraguchi and Lall (2011)

Japanese Government and Bangkok Floods

Risk countermeasures	Effects of business improvement and competitiveness enhancement
Increase/diversification of procurement sources	Cost reduction effect
Acceleration of adopting standardized products	Simplified production adjustment
Facilitate the adoption of products produced in other factories (review of certification system)	Improvement of production development speed
Review of reliability assessment	Realizing intensive investment in priority development products
Clarification/expedition of decision making process	Prompt review/improvement of business strategy
Visualization/simplication of supply chains	Enhancement of cooperation with parts manufacturers

Note: It is necessary to note that all the elements do not always correspond to each other. Source: Created by METI using Nikkei Electronics (2012) as a reference.

Industry Clusters and the "Cambridge Phenomenon"

https://www.areadevelopment.com/siteSelection/jan2011/industry-clusters-evolve-location-decision93090.shtml

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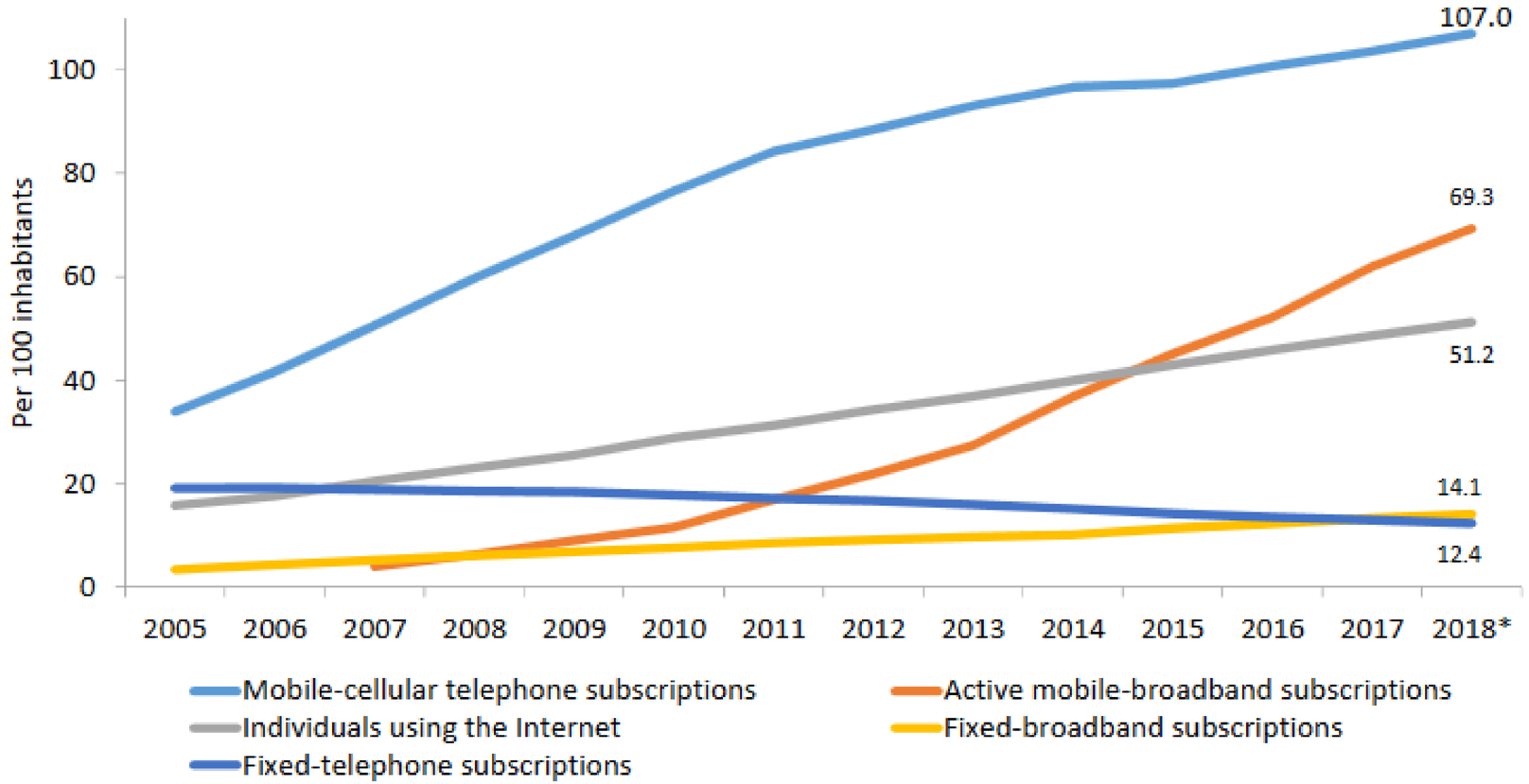
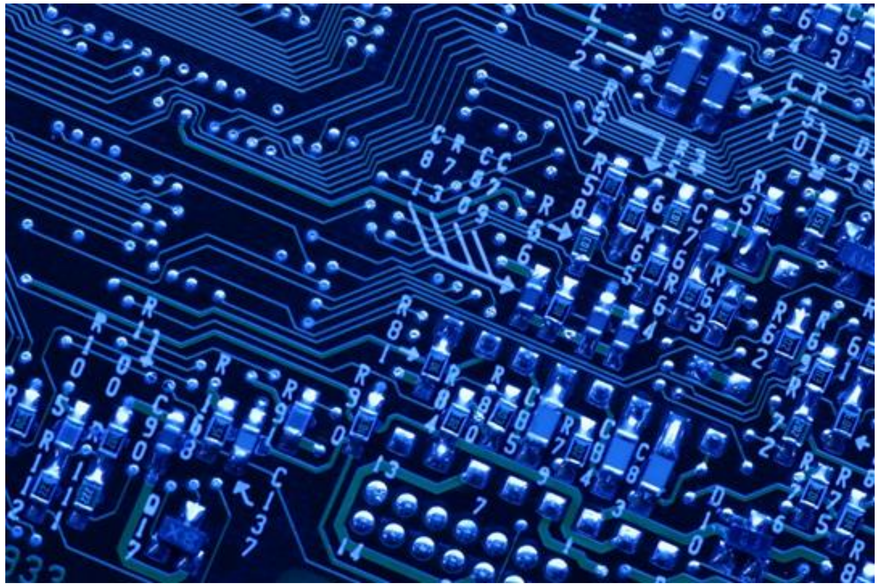
Technology Foundations - Global ICT Development (2005 – 2018) (ITU)



Note: * ITU estimate.
Source: ITU.

Source: ITU Measuring the Information Society 2018

Storage, Transmission and Computer Processing



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Significant potential exists to provide financial services...

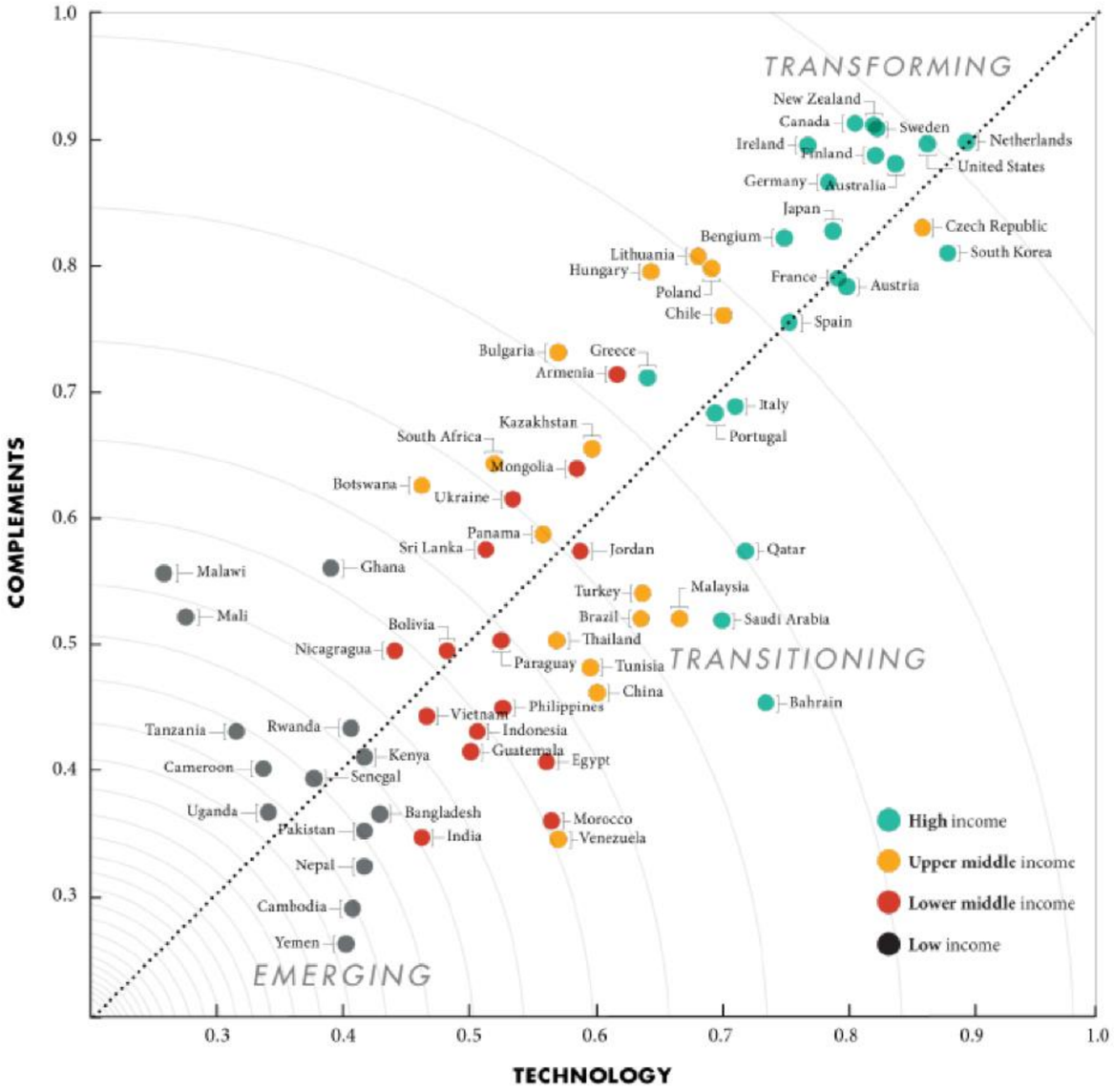
...to underserved people in emerging markets via their mobile phones

Source: GSMA; Global Findex database 2014, World Bank; *World development indicators*, World Bank

McKinsey&Company

#financialinclusion

Race Between Technology and Complements



Complements: Index of quality of institutions, skills and regulations.

Technology: Index of quality of access to internet and related technologies.

Source: WDR 2016 Team, Doing Business, World Economic Forum; Trade in Services Restrictiveness Index and World Development Indicators.

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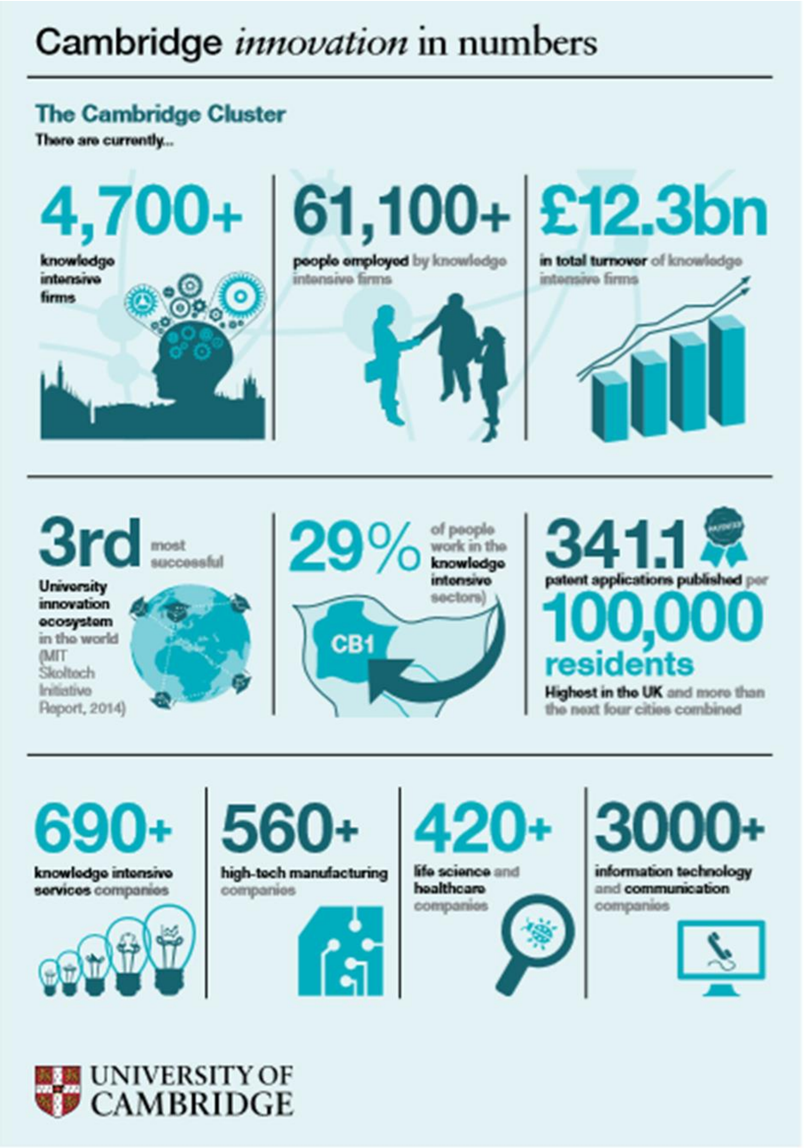
Business Environment Quality (Porter 1990)

“The Cambridge Phenomenon”



Source: http://www.access.trin.cam.ac.uk/gallery/#jp-carousel-146

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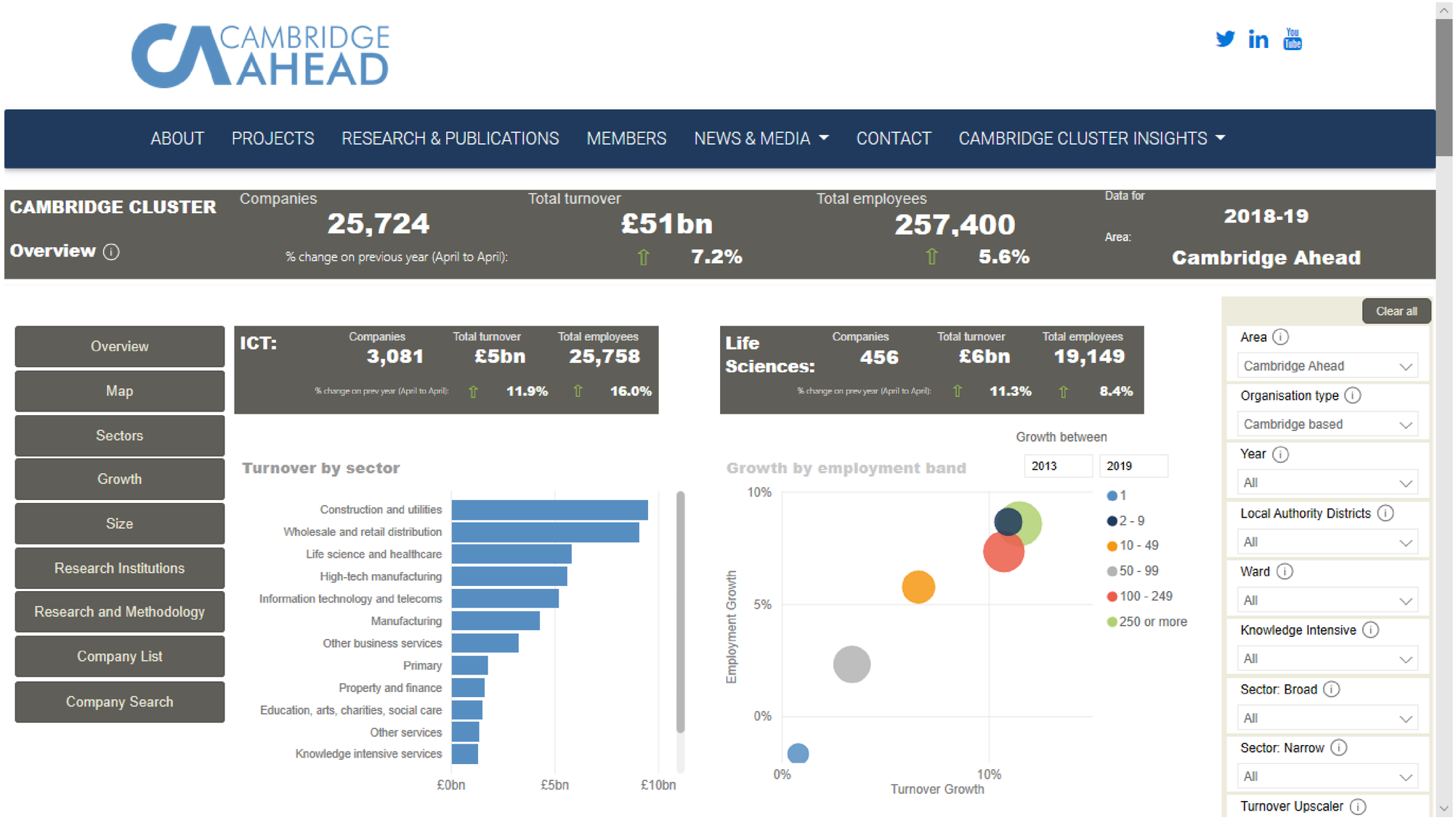

Source: https://www.cambridgeahead.co.uk/cambridge-cluster-insights//

SILICON VALLEY U.S.A.

(This is the first of a three-part series on the history of the semiconductor industry in the Bay Area, a behind-the-scenes report of the men, money, and litigation which spawned 23 companies — from the fledgling rebels of Shockley Transistor to the present day.)

By DON C. HOEFLER

It was not a vintage year for semiconductor start-ups. Yet the 1970 year-end box score on the San Francisco Peninsula and Santa Clara Valley of California found four more new entries in the IC sweeps, one more than in 1969.

The pace has been so frantic that even hardened veterans of the semiconductor wars find it hard to realize that the Bay Area story covers an era of only 15 years. And only 23 years have passed since the invention of the transistor, which made it all possible.

For the story really begins on the day before Christmas Eve, Dec. 23, 1947. That was the day, at Bell Telephone Laboratories in Murray Hill, N.J., three distinguished scientists, Dr. John Bardeen, Dr. Walter Brattain and Dr. William Shockley, demonstrated the first successful transistor. It was made of germanium, a point-contact device that looked something like a crystal detector, complete with cat's whiskers.

The three inventors won the Nobel Prize for their efforts, but only one of them, Dr. Shockley, was determined to capitalize on the transistor commercially. In him lies the genesis of the San Francisco silicon story.

It was only by a quirk of fate, however, coupled with lack of management foresight, that Boston failed to become the major semiconductor center San Francisco is today. When Dr. Shockley left Bell Labs in 1954, he headed first for New England to become a consultant to Raytheon Co., with a view toward establishing a semiconductor firm there under its auspices.

Source: http://www.theatlantic.com/technology/archive/2012/06/what-happened-to-silicon-values/258905/

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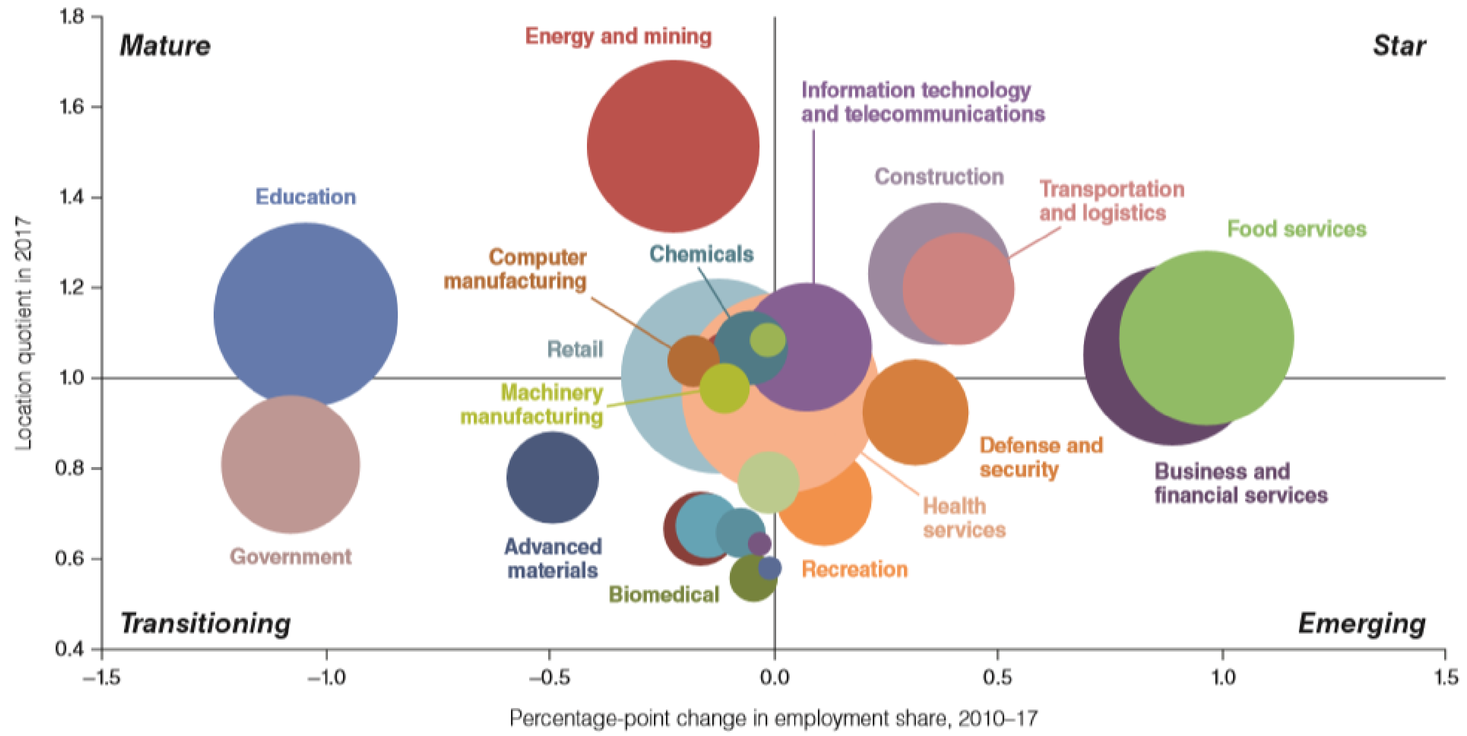
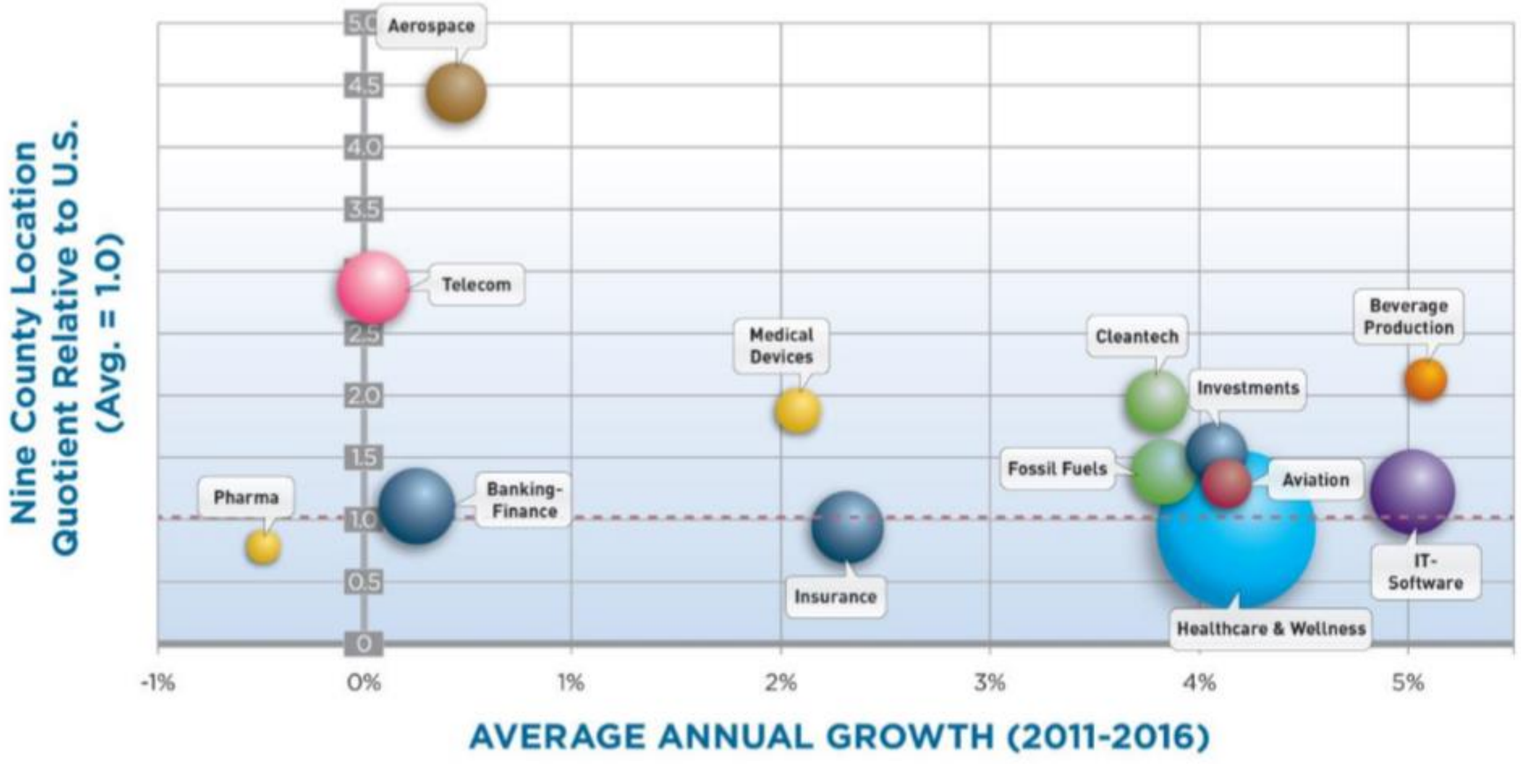
Texas Industry Clusters



NOTE: Bubble size represents cluster share of metropolitan statistical area employment.
SOURCES: Texas Workforce Commission; Bureau of Labor Statistics.

Source: https://www.dallasfed.org/research/heart/overview/

Texas Industry Clusters



Source: /http://www.metrodenver.org/media/230157/2017-industry-cluster-study-full-report-.pdf

Source: :http://www.sipa.gov.tw/english/index.jsp

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Source: http://www.yrp.co.jp/en/outline/index.html

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Estonia's technology cluster

Not only Skype

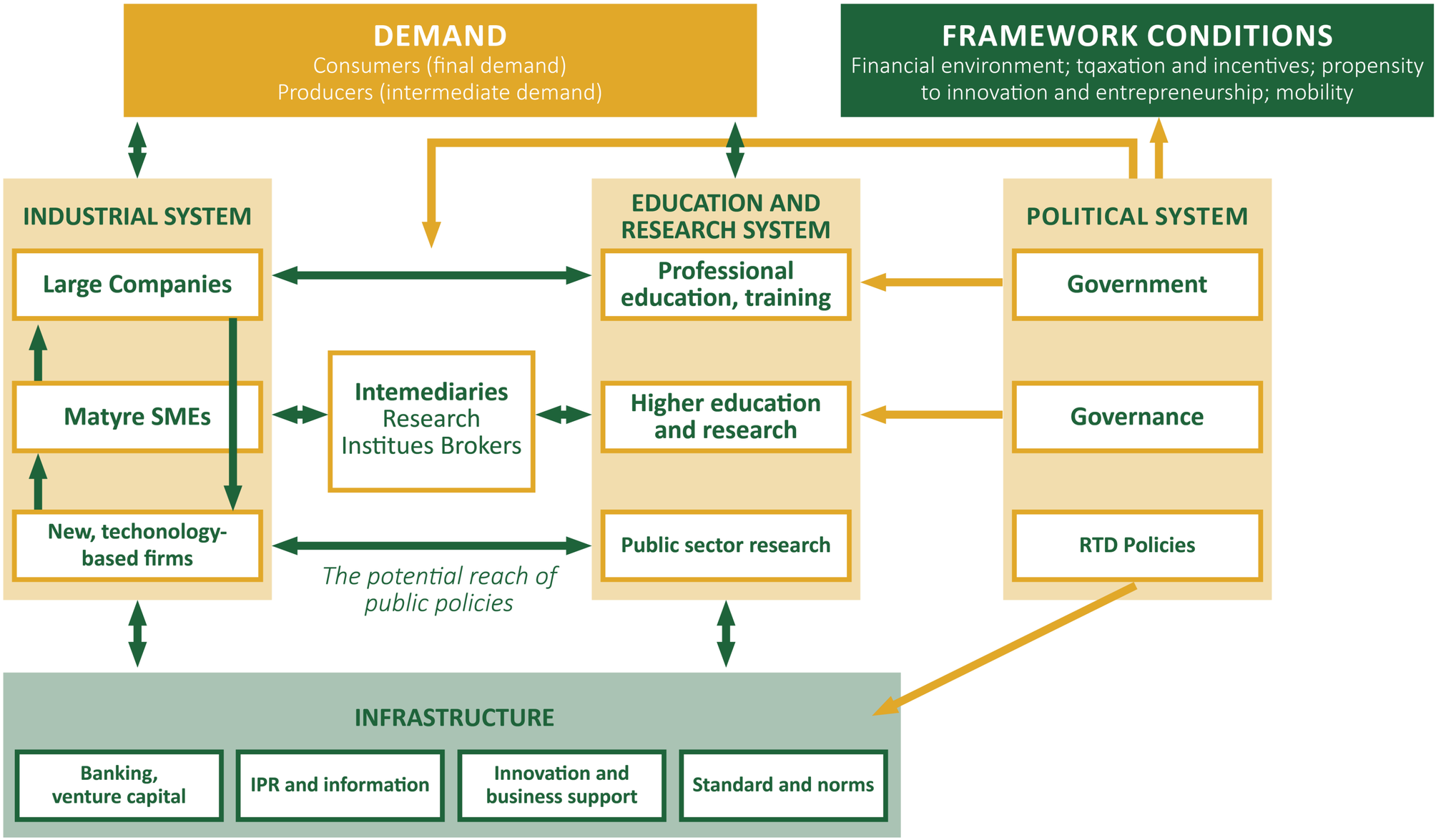
Jul 11th 2013, 15:00 BY L.S. | TALLINN

IT TAKES just five minutes to register a firm in Estonia, says Mihkel Tikk, the head of the country's online portal, a one-stop-shop for e-government services. Entrepreneurs wishing to start a firm log in with their national electronic identity-card and a few clicks later the confirmation arrives by e-mail. That service and many other equally convenient electronic offerings are a big reason why Tallinn, Estonia's capital, is now mentioned in the same breath as Berlin, London and even Silicon Valley. According to one estimate, Estonia holds the world record in start-ups per person—a sizeable feat considering that the country has only 1.3m people.

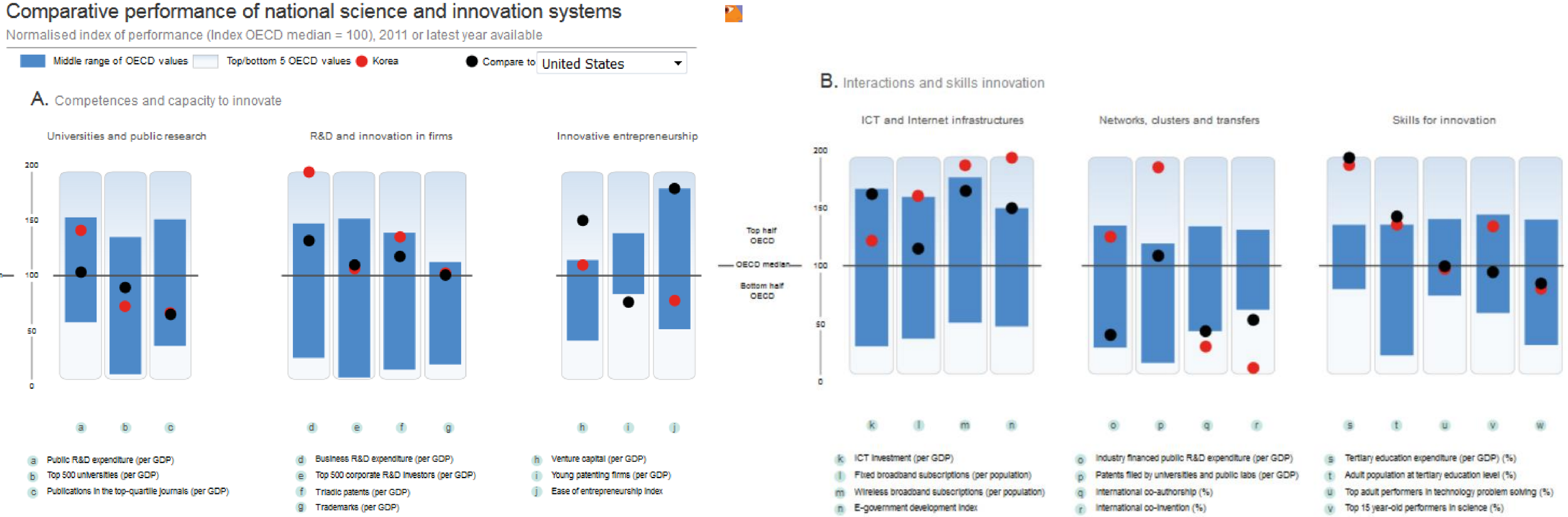
Source: http://www.theatlantic.com/technology/archive/2012/06/what-happened-to-silicon-values/258905/


STARSHIP
Piedmont

National Models of Innovation



A Comparative Snapshot of Innovation Systems



Source: http://innovationpolicyplatform.org/STICharting/benchmark.htm?iso=kr

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Elements of ICT Innovation

- Universities and IP
- Entrepreneurs and Highly Skilled Managers and Technical Talent
- Firms and Sectors
- Access to Capital
- Infrastructure
- Local Quality of Life
- Global Connections
- Policies and Processes

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Universities and IP

Source: http://www.ranepa.ru/

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https://www.theweeklyjournal.com/business/upr-secures-26-patents/article_4350d0da-5291-11ea-924b-93c53f465ef0.html

FEATURED

BUSINESS

UPR Secures 26 Patents

From breast cancer drugs to solar panels, researchers and scientists at the institution are creating technology to improve public health and quality of life

Cynthia López Cabán, The Weekly Journal
Feb 19, 2020

The University of Puerto Rico has secured 98 patents and is awaiting approval to the exclusive rights of another 50 inventions. (Courtesy)

Universities and IP

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Entrepreneurs and Highly Skilled Managers and Technical Talent

Source: http://www.entrepreneurshiplife.com/what-it-takes-be-an-entrepreneur/

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Firms and Sectors

Source:
http://www.ntt.co.jp/kankyo/e/protect/greenntt/docomo.html

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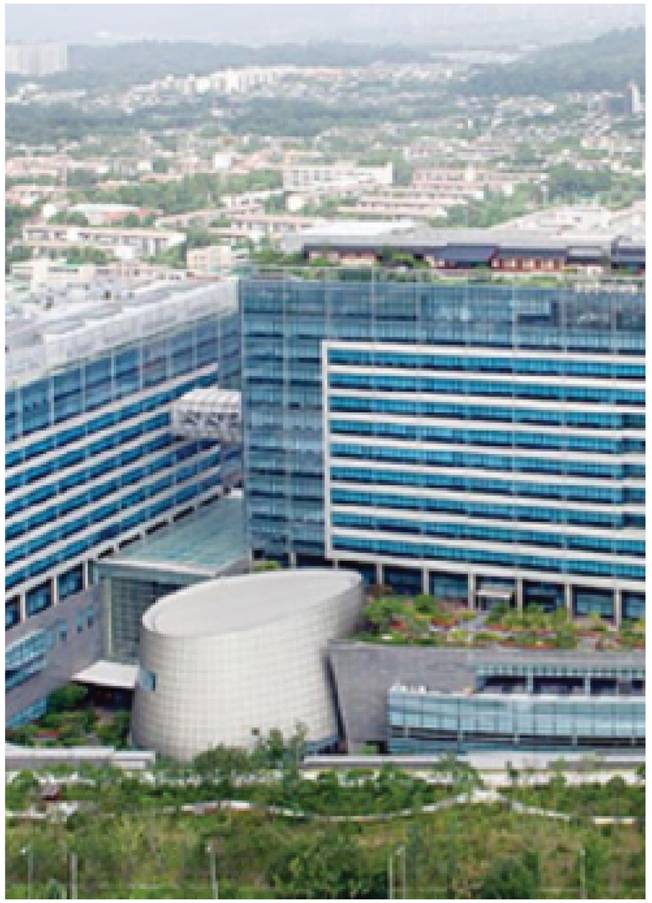
Firms and Sectors

Source: https://www.teslamotors.com/about /l



Source: http://www.samsungengineering.com/aboutUs/globalOffice/common/goView

Source: http://www.wired.com/2013/11/a-glimpse-into-apples-crazy-new-spaceship-headquarters/ l

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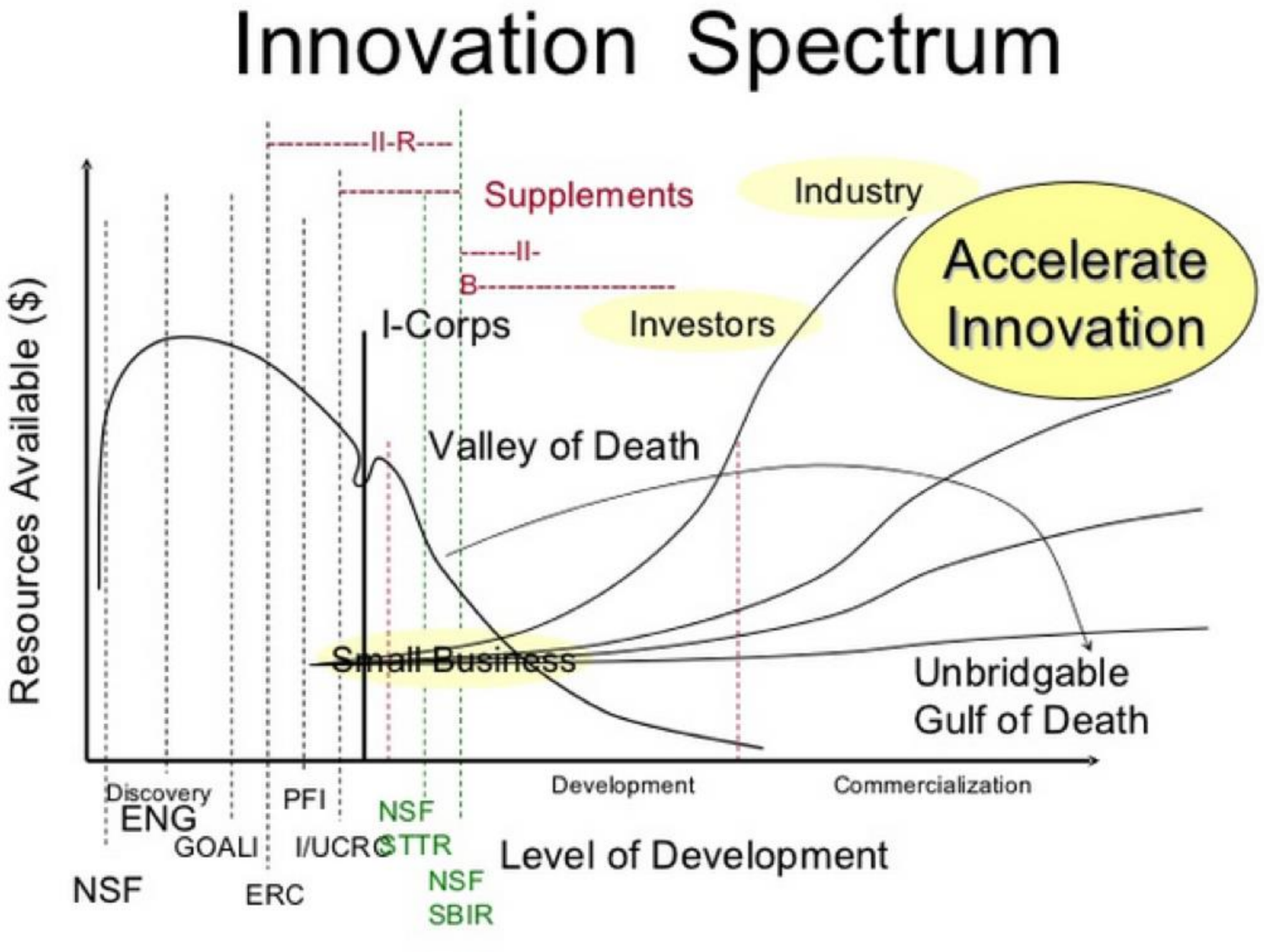
Access to Capital



Morro Venture Partners Launches Puerto Rico's First Tech Venture Fund with $17.5 Million

San Juan – February 27, 2019. With tech entrepreneurship booming in Puerto Rico since Hurricane Maria, Morro Venture Partners, under parent company Advent-Morro Equity Partners, has launched a $20 million early-stage venture fund to support and fuel the growth of technology companies from the island.

Following decades of success as a growth equity investor, Advent-Morro recognized a significant gap in the early-stage tech investment market given the accelerated growth in the Latin American tech markets and the high quality of the companies and management teams coming to Puerto Rico's Parallel18 tech accelerator program. "Our initial goal was to raise $10 million; however, strong investor interest both locally and from the mainland has pushed our ultimate target to $20 million. A first close at $17.5 million, with a highly sophisticated investor base, is a great validation to the opportunity in establishing Puerto Rico as a hub for Latin American tech," commented Cyril Meduña, Managing Partner of Advent-Morro.

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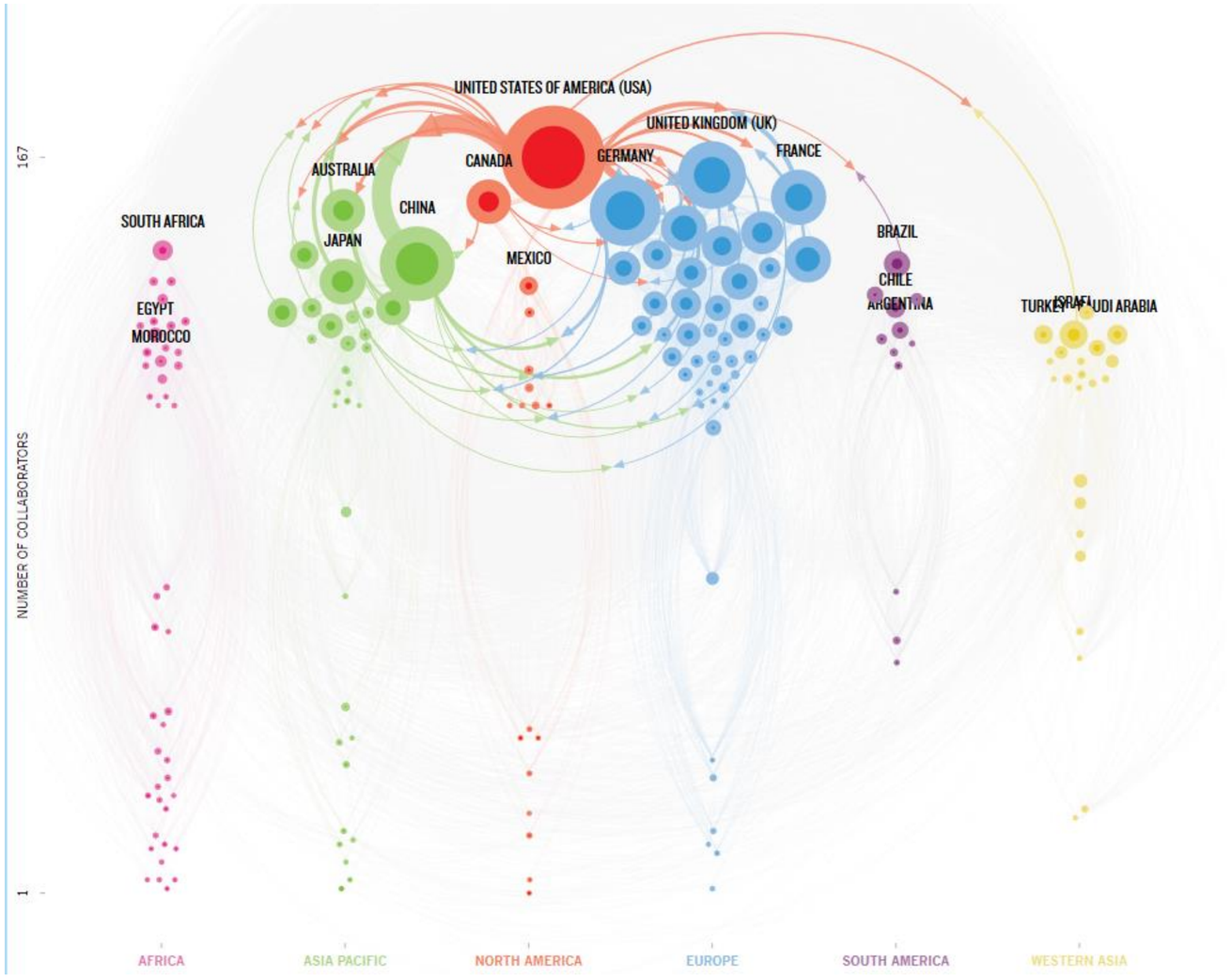
Infrastructure

https://www.businessinsider.com/japan-infrastructure-projects-2019-5

Local Quality of Life

Source: http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=2995172

Source: Fairfax County Economic Development Authority



Global Research Collaborations – Nature Index

Source: https://www.natureindex.com/country-outputs/collaboration-graph

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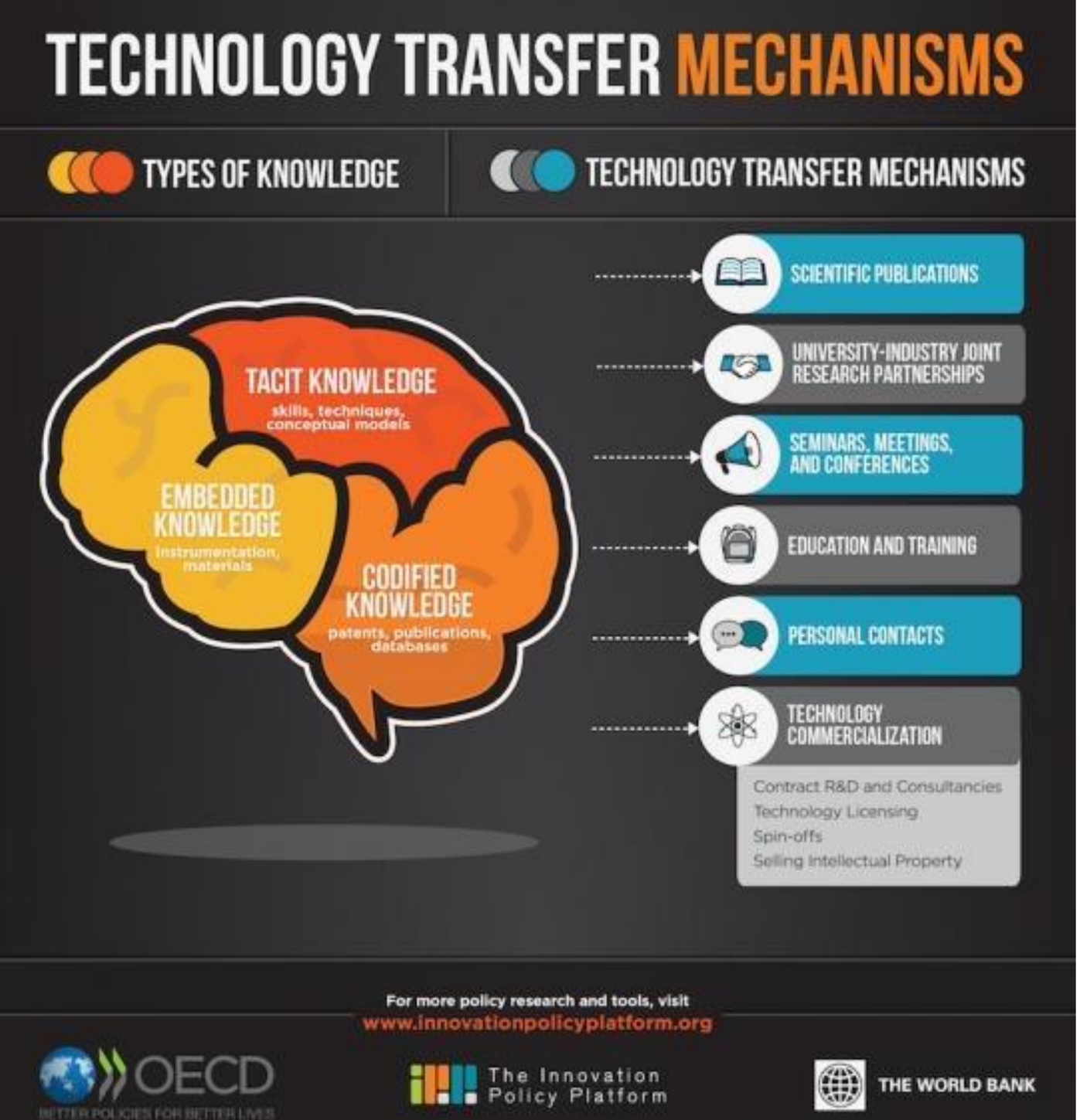

Policies and Processes

Source: OECD Innovation Policy Platform, 2015

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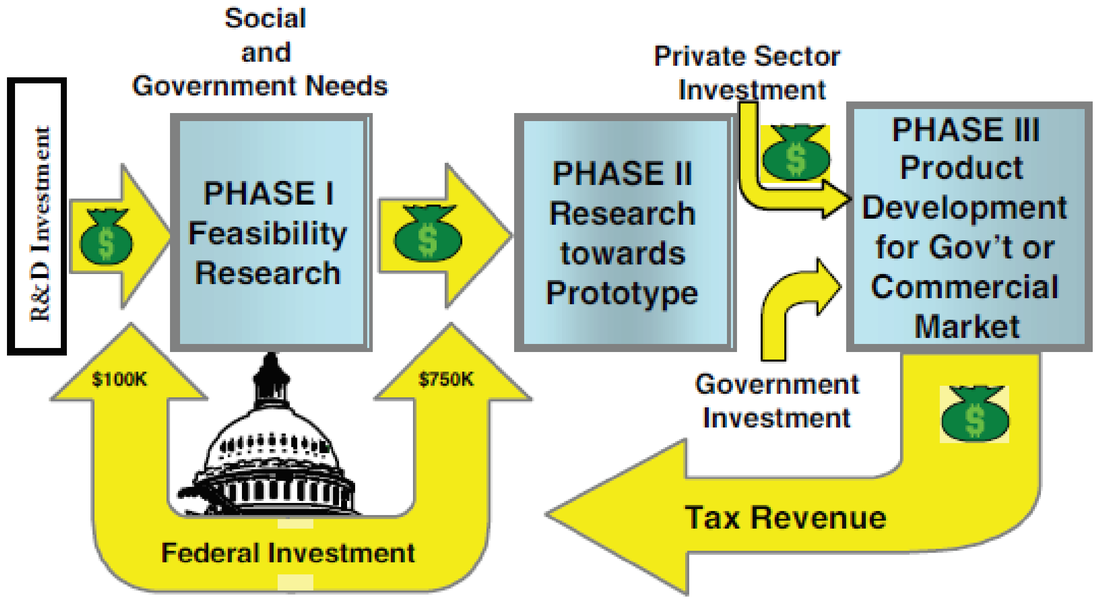
Small Business Innovative Research Program – "America's Seed Fund"



- 150,000 Awardees
- $42 billion in Funding

genzyme
A SANOFI COMPANY

Google

QUALCOMM

Symantec.

iRobot

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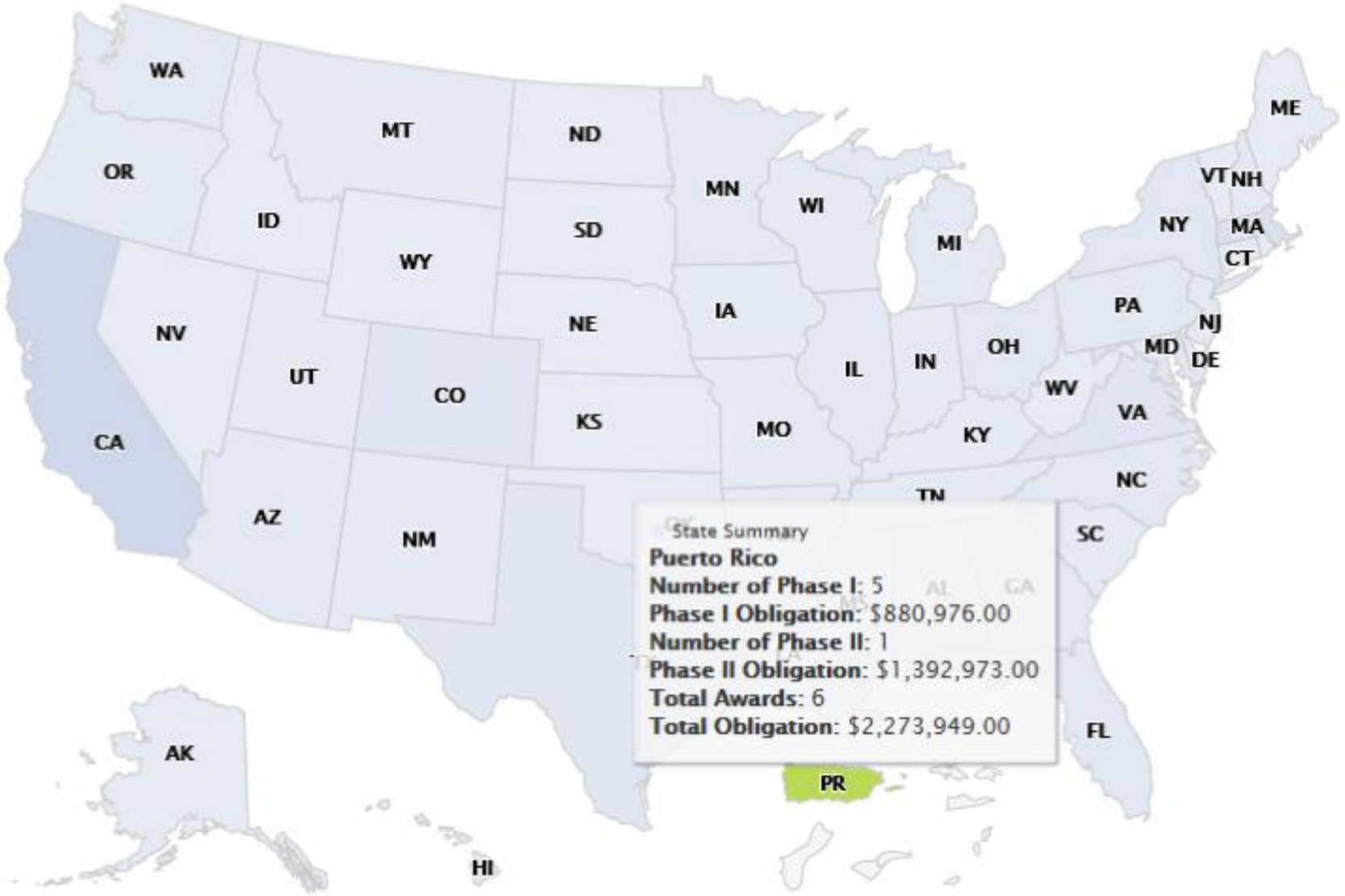

Puerto Rico SBIRs 2019

Source: https://www.sbir.gov/reports/state-summary?year%5B%5D=2019

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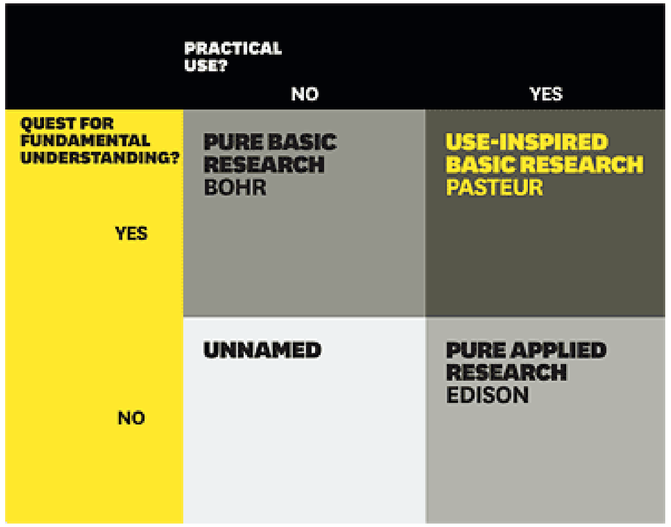
Defense Advance Research Projects Agency (DARPA)

- ARPNET
- First Weather Satellite
- Stealth Technology
- First Computer Mouse
- GPS
- Rare Earth Magnets
- Head Mounted Displays
- High Productivity Computers
- Quantum Key Distribution Network

Source: http://www.bostondynamics.com/robot_bigdog.html



arpa-history-and-timeline?PP=4Source: https://hbr.org/2013/10/special-forces-innovation-how-darpa-attacks-problems

Source: http://www.darpa.mil/about-us/darpa-history-and-timeline?PP=4

Arecibo Observatory

On November 6, 1959, Cornell University signed a contract with ARPA to conduct development studies for a large-scale ionospheric radar probe and how such an instrument might also serve in radioastronomy and other scientific fields. Four years later, on November 1, 1963, an inauguration ceremony was held in Arecibo, Puerto Rico, for the Arecibo Ionospheric Observatory, later to be known more generally as the Arecibo Observatory.

Its telescope "dish"—the largest in the world until 2016 with the completion in China of the FAST dish telescope—is 1,000 feet (305 meters) in diameter, 167 feet (51 meters) deep, and covers an area of approximately 20 acres (0.08 square kilometers). Development of the Arecibo facility was initially supported as part of the DEFENDER program, a broad-based missile defense program. The observatory was designed to study the structure of the upper ionosphere and its interactions with electromagnetic communications signals.

Source: https://www.newcybersource.com/network-solutions/

Puerto Rican Energy Transformation

September 29, 2020

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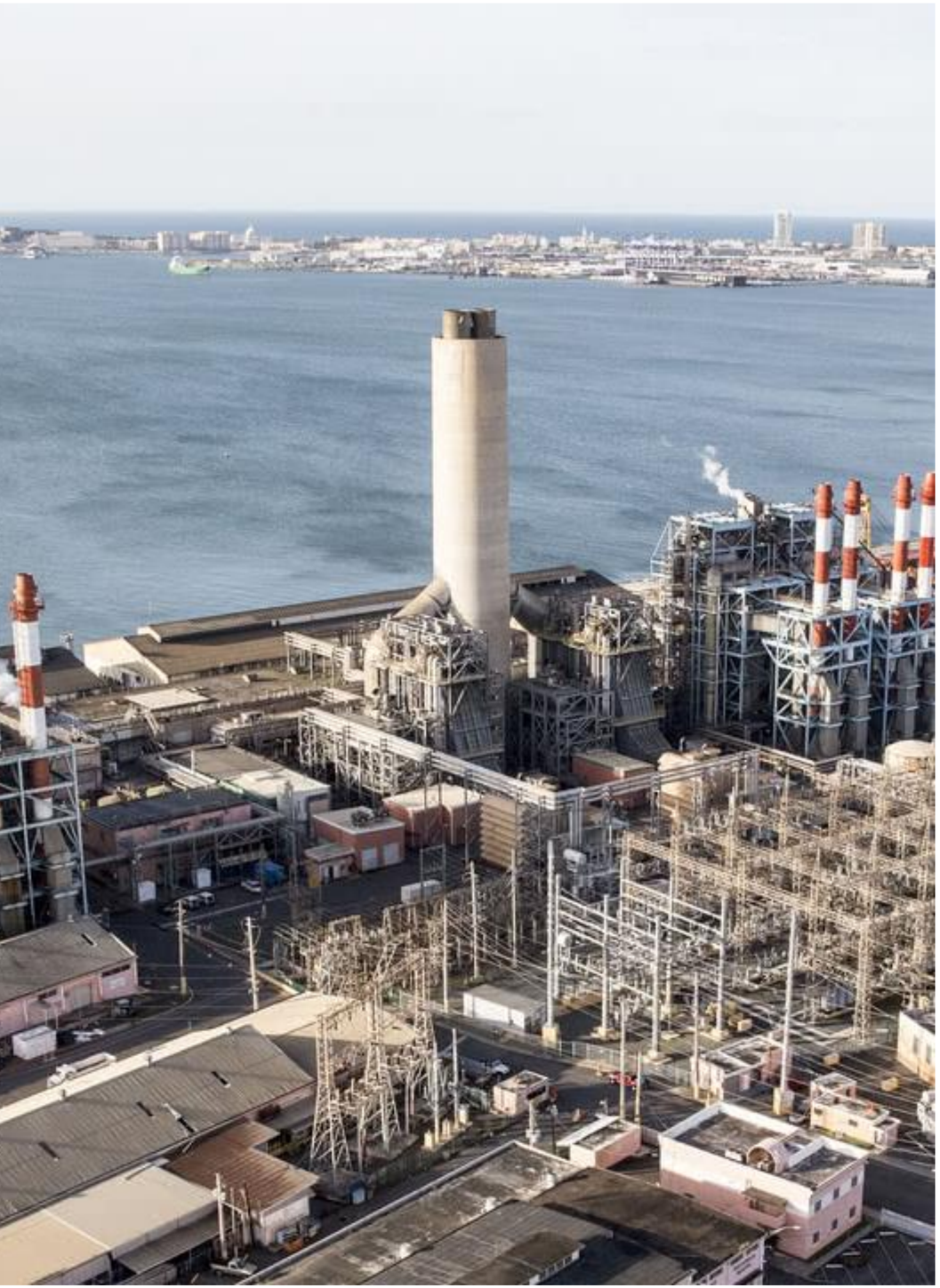

Lack of Strong Energy Foundation

- Puerto Rico's energy infrastructure "Nearly 3 decades older than in rest of U.S."*
  - Only 2% renewal energy before Maria
  - Damage to 25% of power lines dropped 100% of grid
- PREPA has monopoly on power generation & owns most transmission
  - Deeply in debt: $9B in bonds, bankruptcy 2017
  - Already high electricity rates will increase
- Law 17 passed in Mar 2019
  - 100% renewable energy by 2050, 40% by 2025
  - Set process for energy decision-making
  - Important decisions taken on August 24th: 3,500MW of Solar and more than 1,300MW of storage by 2025. Also funds for transmission and distribution hardening
  - PREPA also needs to repay debt—renewables may cut revenues

*RAND 2018, PREB 2019

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Current State

- Proposed 20-year “Integrated Resource Plan” (IRP)*
  - Various scenarios: “gas-heavy” (PREPA preferred) to “solar-heavy”
  - Earthquakes took Costa Sur power plant offline
  - Need solar, wind & energy storage (batteries) to meet Law 17
  - Improve energy efficiency—”negawatts”* first
- Grid still weak--especially in Cordillera Central and remote areas
- Distributed, bottom-up initiatives beginning—more resilient
  - Rural Electric Cooperatives
    - Often link power and comms
    - Sell power to PREPA at low rates
  - Power Purchasing Agreement (PPA) rules inconsistent
    - Inhibit providing power to grid
  - PROTech Ocean Thermal initiative

*RMI

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Way Ahead (1)

- Synchronized, Coordinated, Integrated Approaches
  - Link tech with
    - Social structures
    - Public-private processes
    - Organizational needs
  - Smart roads for autonomous or electric vehicles also need
    - Sophisticated comms and data sharing
    - Which depend on stable power generation & distribution
  - Plan, co-develop & improve these together
    - Community acceptance
    - Trained workforce
    - Agreed-on laws, regulation, insurance

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Way Ahead (2)

- Converge to a smart, connected & sustainable Puerto Rico
  - Innovative, adaptive framework to deliver key services
  - Cross-sector, multi-function
- Improve energy uses in diverse sectors*
  - Transportation (29%)
  - Buildings (38%--18% commercial, 20% residential)
  - Industry (32%)
  - Include agriculture, water, recreation, disaster response, etc.
- Distribute generation & connect by smart grids and data flows
  - Cyber resilience becomes more & more critical
- No one has all the answers
  - Ecosystems of govt, business, civil sector, academia do well
  - Improve quality of life & resource allocation
  - Only unforgivable sin is hubris (“Mine is the only answer”)

*US Energy Information Administration, 2017 data

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Source: https://www.newcybersource.com/network-solutions/

PEOPLE-CENTERED INTERNET

Digital Puerto Rico And Resiliency Innovation Network

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Digital Puerto Rico

Post-COVID-19, digital likely to be more important

- Economy
- Education - distributed Learning
- Disaster response -- Comms, lift and power
- Telemedicine
- Social
- Engage diaspora
- Identity
- Governance

Prerequisites

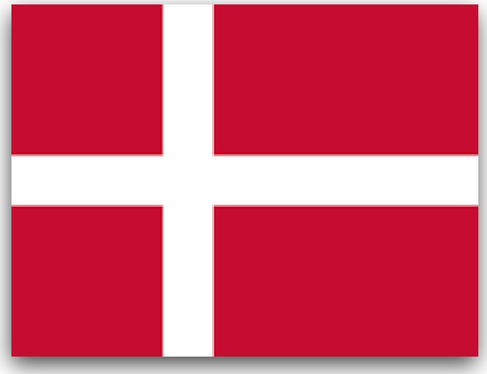
- **Bandwidth**
  - Terrestrial
  - Space-based
  - International
- **Power (stable)**
- **Human Capacity**
- **Citizen buy-in**
- **Regulatory environment**
- **Financing**

http://www.orbitalsystems.com/installation-galleries/university-of-puerto-rico-mayaguez/

Small State Examples (Summarized Last Week)

Estonia

“The most advanced digital society in the world”-- Wired



Denmark

From information society to network society

Singapore

Digital Economy,
Digital Government
Digital Society

Enabling Technologies

- 5G→6G
- LEO/MEO Internet
- Iot/IIoT
- Hybrid Clouds
- Quantum computing

IMAGE SOURCE:https://www.forbes.com/sites/bernardmarr/2019/10/25/what-is-5g-technology-and-how-must-businesses-prepare-for-it/#6cb0ec11758b

People-Centered Internet (PCI)

Working For An Internet That Works For People

- 501(c)3 nonprofit
- Goal: Internet is a positive force for good, improving the lives and well-being of people around the world
- Initiatives include:
  - Promoting connectivity
  - Fighting disinformation
  - Contributing to the discussion about technology ethics
  - Supporting the development of people-centered applications and initiatives
  - Advising policymakers
  - Leveraging technology to help communities be more resilient

PEOPLE-CENTERED INTERNET

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PCI “Digital Puerto Rico” 2018

- 3-month engagement
  - With California Health Medical Reserves Corps (CH-MRC) & RAND Corporation
  - Provide policy proposals for “Digital Puerto Rico"
  - Submitted with other proposals to Governor’s office
  - For submission to FEMA and U.S. Congress

PCI 2018 Recommendations Included

- **Resiliency Innovation Network Leading to Development of a Resiliency Industry**
- **Hotspots: (1) Municipal, and (2) in Public Housing**
- Roadmap for digital transformation
- Data Collection and Standardization for Disaster Preparedness and Emergency Response
- Study Feasibility of Digital Identity
- Innovation Economy/Human Capital Initiative
- Health Care Connectivity
- Resiliency/e-Construction Learning Lab
- Digital Citizen Services
- Government Digital Process Reform

Resiliency Innovation Network (RIN)

Establish RIN across Puerto Rico to:

- **Create businesses** that could enhance Puerto Rico's Resiliency
  - Build on existing PRSTRT and university facilities
  - PRSTRT leads in conjunction with local institutions
- Next step is **resiliency industry** with
  - Maturity models, insurance ties and volunteer engagement
  - In parallel, facilitate resiliency in the communities:
- **Institutionalize progress** through a Resiliency Center of Education and Innovation (RCOEI)

Image credit https://www.provisioneronline.com/articles/109602-meat-industry-resiliency

RIN Approach

- Apply **well-understood network technologies** to Puerto Rico's needs in innovative ways
  - New local companies and jobs
  - Encourage established companies
  - Empower Puerto Ricans
- Facilitate **resiliency innovation cluster**
- Lead to **resiliency industry**

Image source: https://networkencyclopedia.com/what-is-networking/

Network Contributions (1)

- Set research priorities
  - Comparative advantage of Puerto Rican researchers
  - Resiliency innovation in telecomms, energy, water, etc.
- Roll out community model
  - Leverage best practices
    - Bottom up, begin by **listening**
    - Bi-directional **learning**
    - Build **lasting** capacity

- Establish **two resiliency innovation labs** in Trust's facilities
  - **San Juan** headquarters
  - Guanajibo Research and Innovation Park (GRIP) in **Mayaguez**

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Puerto Rico

Area: 5,328 mi²
Population: 3.194 million

Network Contributions (2)

- **Establish RCOEI to institutionalize progress**
- **Lead to resiliency industry in Puerto Rico, including**
  - “Resiliency maturity models”
  - Ties to insurance and re-insurance industry
  - Ways to engage volunteers
- **PRSTRT develops and tests technologies in 90-day cycles**
  - Benefits will accrue quickly

Resources Available to RIN

- **Leverage PRSTRT's existing resources:**
  - Entrepreneurial programs
  - Existing corporate ties
  - Existing government ties to Fomento
  - Technology Transfer Office (TTO)
- **Field experimentation sites throughout the archipelago**
  - Test in varied micro-climates and topographies
  - PRST could use Ciencia Puerto Rico (CienciaPR) network to ID SMEs

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Targets for Resiliency Innovation Network

- At least 30 new local companies and 300 local jobs in first year
- Spur economic returns
- Induce import substitution
- Encourage established companies interested in resiliency technologies to set up new operations or expand existing operations in Puerto Rico
- Open new export markets and opportunities
- Increase Puerto Rico's resiliency to natural disasters
- Lower disaster relief and recovery costs

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Wide-Ranging Sector Impacts (1)

- **Primary contribution in Telecoms/IT sector**
  - **Provides an ecosystem for developing and testing**
  - **Contributes to Capacity Planning and Community Building (CPCB)**
  - **Helps build new skills in “resiliency” technology**
  - **In economics sector, RIN teaches planning and business development skills that would attract investment**
  - **Distributed, integrated network also should make more rural and municipal areas attractive to investors**
  - **RIN supports Financial Oversight objectives**
  - **In the long run a “resiliency industry” could be an exceptionally valuable asset for Puerto Rico**

Wide-Ranging Sector Impacts (2)

- **RIN also useful to promote innovation in:**
  - **Energy** (ecosystem for developing and testing new resilient energy-related tech)
  - **Natural and Cultural Resources** (areas like remote sensing and data analysis, as well as field experimentation)
  - **Water** (water purification, transport and storage)
  - **Housing and Public Buildings** (ecosystem for developing and testing new resilient and sustainable housing-related tech and building)
  - **Health and Social Services** (skills supporting healthcare tools, services & delivery)
  - **Municipalities** (support local integrated services in cities and small communities)

Wide-Ranging Sector Impacts (3)

- An annual resiliency innovation conference in Puerto Rico
- Resiliency innovation facilities on many universities
- New ventures form, local workforce educated and trained, and opportunities emerge for non-local investors to invest locally
- RIN also aligns with several Financial Oversight objectives

Image source: https://campustechnology.com/articles/2015/02/17/how-to-launch-a-campus-innovation-center.aspx

Potential Costs and Funding Mechanisms

- **Low Cost (fraction of damage from Irma/Maria, also could improve resiliency to earthquakes and pandemics)**
  - **$2.2 M up-front and $2.4 M annually**
    - Expand testing, teaching, and applications
    - Leverage existing infrastructure of PRST, Fomento, and Puerto Rican universities
    - Start community resiliency model
    - Establish RCOEI
- **Potential Funding Mechanisms**
  - **Initially PRST, Fomento, and U.S. federal programs**
  - **Private funding possible**
  - **Commercial successes could provide PRST revenues through IP licensing**

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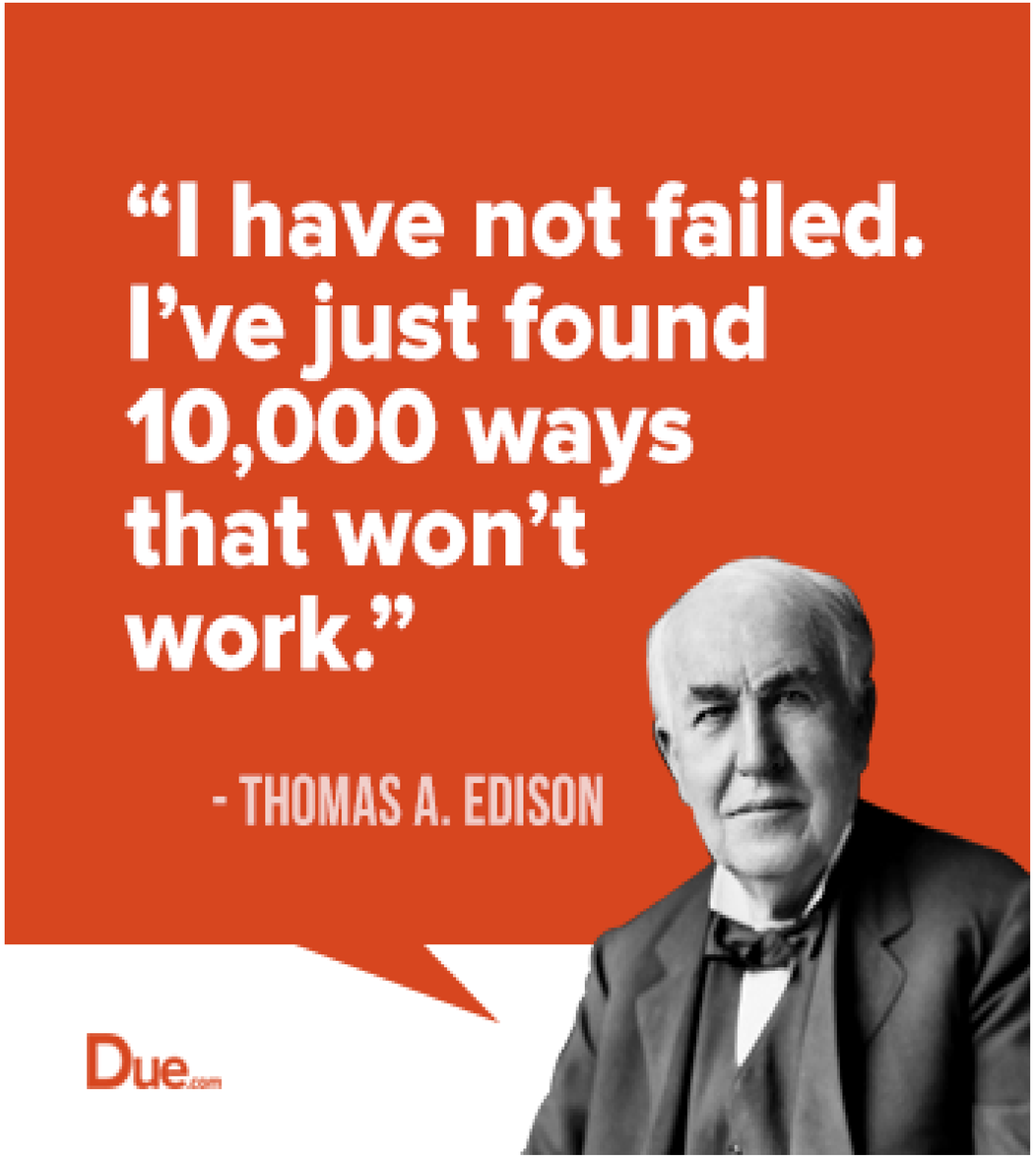

Potential Pitfalls

- Investment could be limited by Puerto Rico’s austere fiscal situation
- Participant pool could be restricted limited by “brain drain”
- New businesses could be dissuaded by barriers

But don’t forget:

First
Attempt at
Iterative
Learning

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Center for Resilient and Sustainable Communities

Potential Resource

Listening, Learning, Lasting

Knowledge Sharing

via STAR-TIDES network

Trans-Disciplinary Research and Teaching are Key

Community Focus

Innovative Economics

Social (Resilience)

Economic (Development)

Technological (Platforms) From **STAR-TIDES**

Energy, Energy Storage

Health, Nutrition, Integrated Cooking

Shelter Heating/Cooling Lighting

Governance

Information & Communications Technology (ICT)

Water, Sanitation, Hygiene (WASH)

Agriculture, Food Security

Platform Integration

Keys to Success: Narrative; Systems Thinking; Shared Knowledge; Resources; Education; Logistics; Digital Enabling Technologies

Stability/Security ⟷ Sustainability

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Summary

- **Planning and execution of Digital Puerto could extend beyond political turnovers**
  - Examples from countries in transition: Estonia, Rwanda, Colombia
- **Exceptional benefits**
  - Especially now
- **Need ALL your help to pull it off**

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Image Source: com/powered/networking-the-most-hen-should-do-for-their-careers-but-ident/

5 Steps to Successful Digital Marketing

How to Stand Out and be Visible in a COVID-19 World

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Definition of Visible Company

A company that has attained high visibility and a reputation for expertise and quality service in their industry niche.

Why is Visibility Important?

More Opportunities

Easier to Close Sales

Faster Company Growth

Higher Profits

Greater Valuation

5 Keys to Successful Digital Marketing

- Target Market
  - Buyer's Personas
- Website
- Social Media
- Content
- Digital Marketing in Action

Target Market

- Finding your niche
- Buyer Personas

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Finding Your Niche

- Target narrow group of customers
- Conduct Market Research
  - Secondary Research
  - Primary Research
- Differentiate product or service
- Avoid crowded markets
  - Don’t compete on price alone

Buyer Personas

- Fictional representation of your ideal customer
  - Mother with young child
  - Does she work?
  - How much does she spend on her child’s clothes?
  - Does she have more than one child?
  - What does she read on the Internet to learn about children's clothes?

Poll Question #1 (After Buyer Persona)

- Do you have a clearly defined target market with your products and services differentiated from your competitors?

- Yes
- No


communication
browsers
search
networking
information
engines
files
professionals
Web
security
careers
essential
Internet
access
concepts
users
e-mail
issues
principles
services
clients
database
technology
social
roles
management
basic

Websites

High-Performance Website

- Clear Messaging and Professional Imagery
- Importance of Responsive Design
- Educational Content
- Optimized for Search Engines (SEO)

High-Performance Website Clear Message & Imagery

- 80.8% of Buyers view website
- Brand Positioning
  - What do you do?
  - Who is your Target Market
  - Why should I buy from you?
- Professional Imagery
  - Try to use original photography
  - If stock photo, use local photos
  - Images should descript brand

High Performing Website Responsive Design

- Desktop
- Laptop
- Tablet
- Mobile Phone
- Next new technology?

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High-Performing Website Educational Content

- Stock Content
  - Guides
  - Blogs
  - Resources Section of Website
- Useful and Relevant Expertise

  Material seeks to educate audience
- Not Marketing Materials
  - No brochures
  - No Sales Pitch

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High-Performance Website Search Engine Optimization (SEO)

- Relevance (Keywords)
- Website Authority (Links)
- User Experience (Responsiveness)
- Technology (Optimized)

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Social Media

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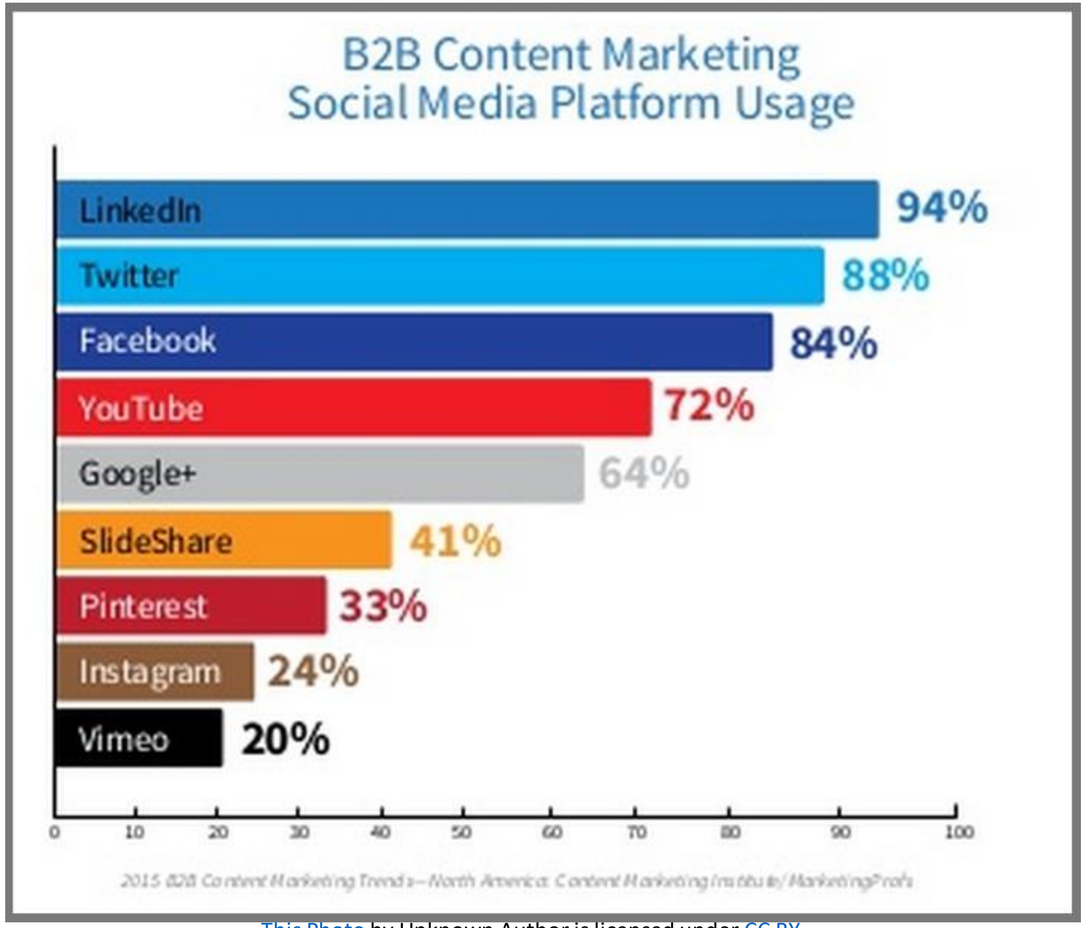
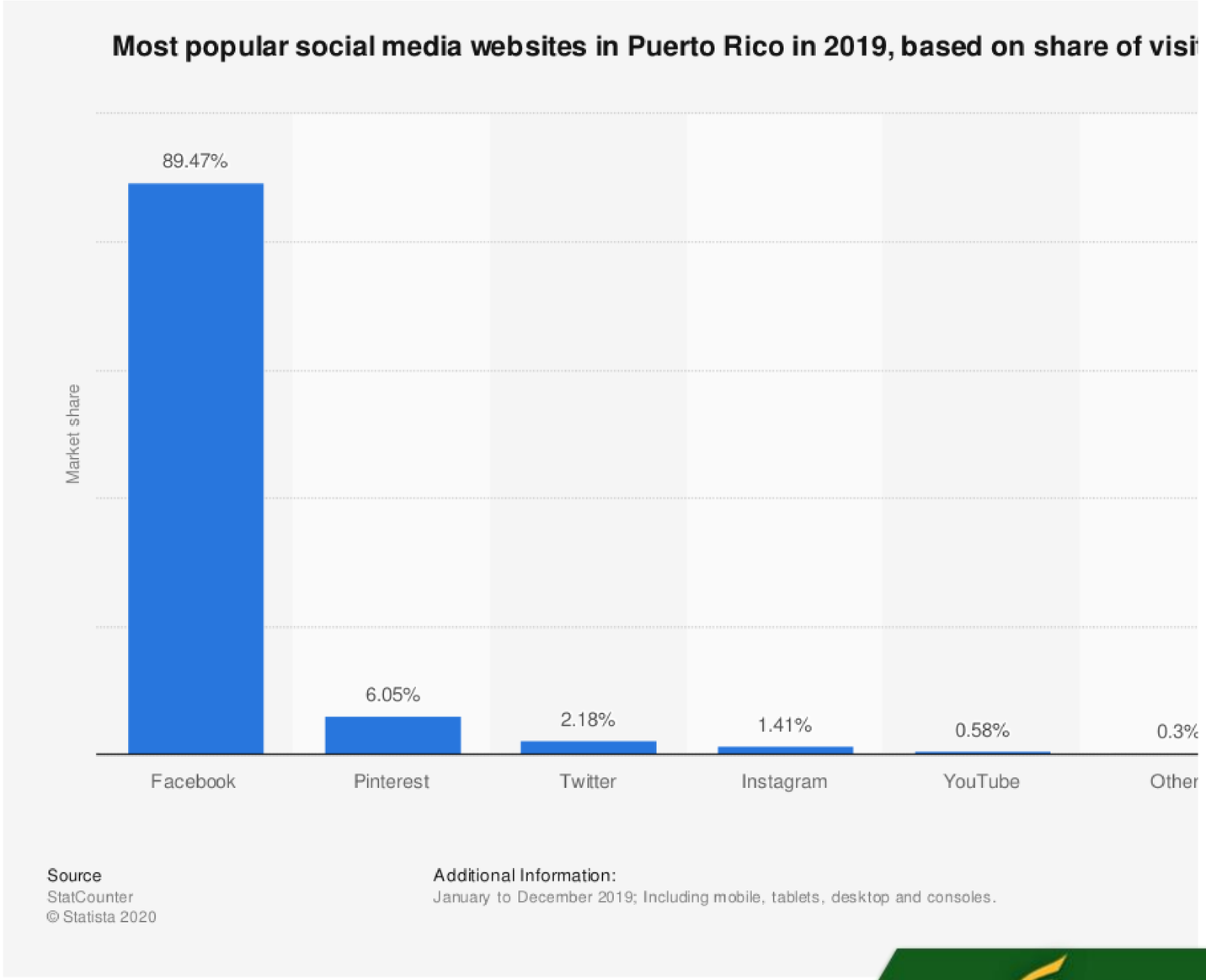
How Businesses Use Social Media

- Networking
  - Less Schedule Conflicts
  - Less Geographical Boundaries
  - No Travel
- Content Promotion
- SEO
- Recruiting



Stay Connected with Social Media

- Puerto Rico's most popular social media platform is Facebook
- Most businesses use Facebook for B2C (Business to Consumer) connections



Facebook

- Most effective ways to use Facebook:
  - Create an impressive profile page with a professional picture
  - State clearly what your business can do for your target audience
  - Regularly post content that is relevant to your target audience
- Seek profession digital marketing help

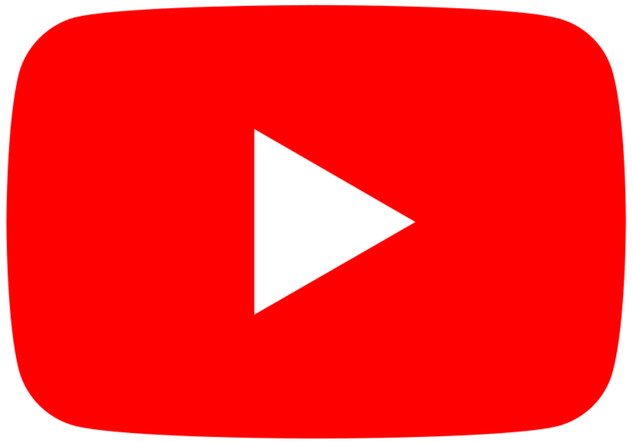
LinkedIn

- Primarily for B2B Use
- Researching Target Market
- Networking
- Recruiting (initial purpose)
- Net Company Page + Personal
  - Professional Photo
  - Descriptive Title
  - Link to Website

Twitter

- Twitter is used by everyone
- Best use is for real time communication
- Both B2C & B2B companies use to connect with target market
- Only allows 140 characters or less per tweet
- Many influencers use twitter to connect with their followers

You Tube



- You Tube is used by everyone
- Ideal for sharing multimedia content
- Especially good to educating your clients about your products and services
- Some possible uses
  - Recorded webinars/ presentations
  - Product demo’s

Content Marketing

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What is Content Marketing?

- Educational material that is useful and relevant to your target audience
- Content is King!
- Demonstrate expertise
- Generates Referrals!
- 86% of B2B companies use it

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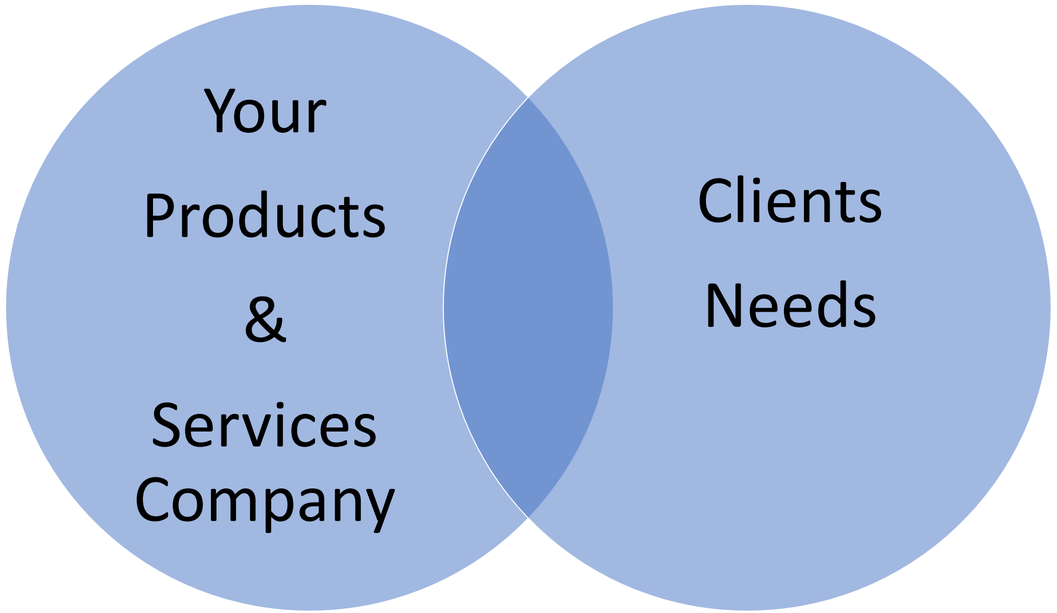
Developing Your Content



- Focus on the Intersection of Your Services & Client's Needs
- Determine you Clients Needs
  - What are their pain points?
  - Where do they need help?
- Assess Your Products & Services
  - Can you fill the Clients Needs?
  - Do you have the resources & expertise to solve their problem?

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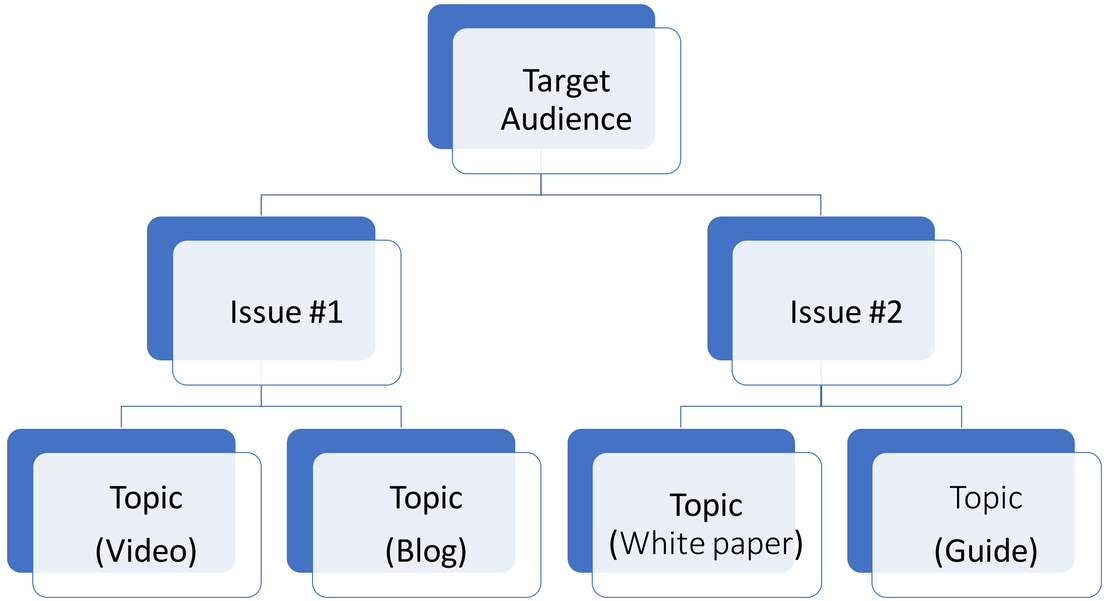
Content Formats

- Make sure you are clear about which issues are important to target audience
- Create 2 to 3 Major Issues to Discuss
- Create 1 or two Topics to create content about



Types of Content

- Webinars
- Social Media Posts
- Guides
- E-book

- Webinars – demonstrate firm's expertise and educate audience
- Social Media Posts – great way to speak directly to your audience
- Guides – medium-length pieces usually for website download
- E-books – ultimate statement in reputation expertise. Long version of a Guide

Poll Question #2 (Before Digital Marketing)

I have a lot of competitors in my market?

- Strongly Agree
- Agree
- Not Sure
- Disagree
- Strongly Disagree

Digital Marketing in Action

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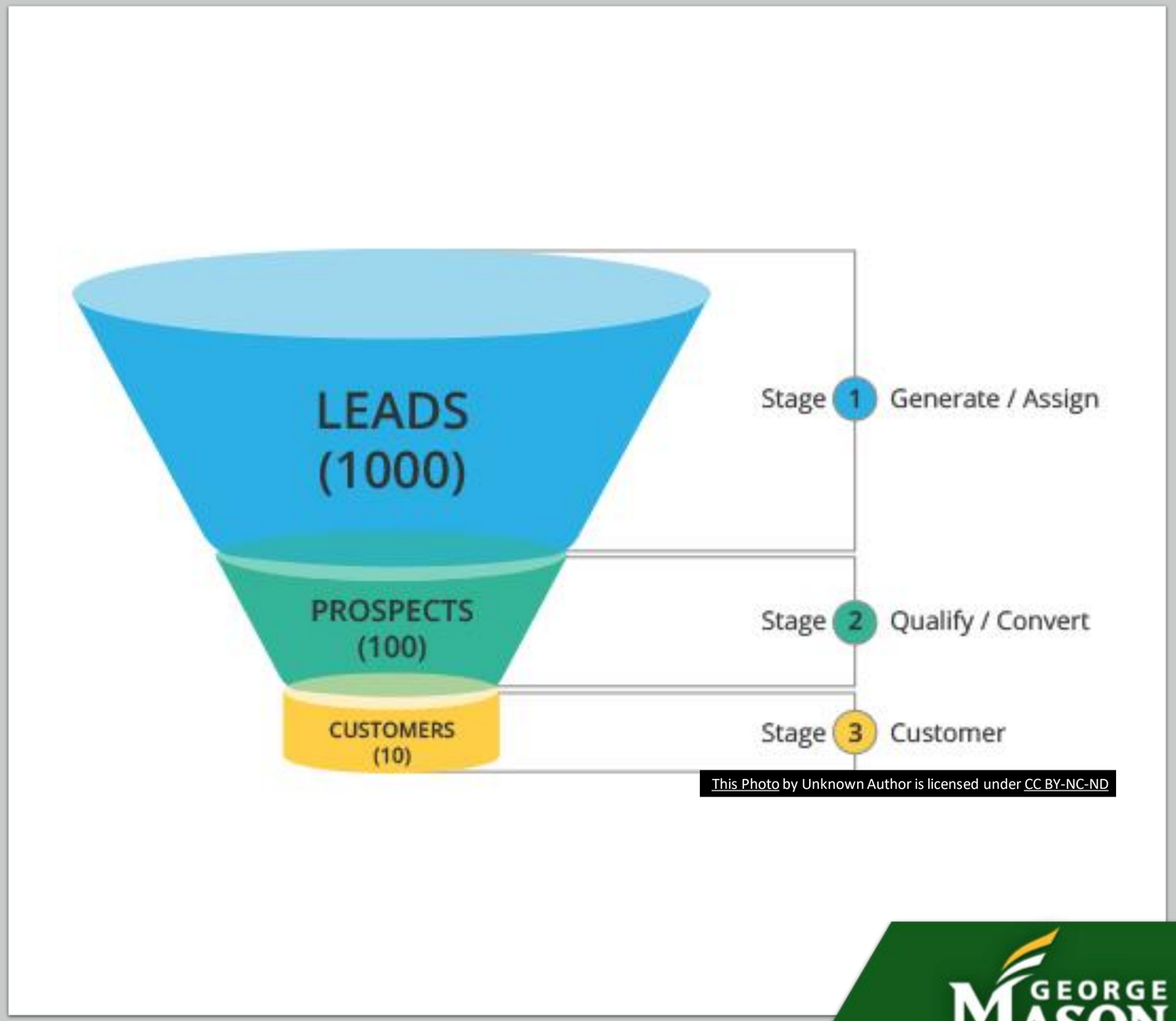
Understanding Marketing Funnel

- Attract
  - Blogs Posts & Article
  - Videos
  - Networking & Speaking
- Build Engagement
  - Guides
  - Research Reports
  - E-books
- Turn Opportunities into Clients
  - Demos
  - Free Consultations



Customer Relationship Management System

- Stores contacts, prospects and influencers in your target market
- Stores all data on a contact in one place
- Segment contacts into similar groups
  - Mother's of children
  - Grandparents of children
- Used as a hub for delivering content to target market

Measure Your Digital Marketing Effectiveness

- Website/SEO
  - Google Analytics
  - SEMrush
  - Website Visits
  - Organic Search
  - Keyword Analytics
- Social Media
  - Develop Calendar
  - Followers
  - Comments
  - Shares
  - Likes

Building a Resilient Business: Before, During, and After a Disaster

Protection of People, Data, and Operations

Puerto Rico Science, Technology & Research Trust

Resiliency and Business Innovation

Center for Resilient and Sustainable Communities

Organized by the Puerto Rico Science, Technology & Research Trust

Sponsored by: U.S. Economic Development Administration

June 4, 2020, 6:00 PM- 7:15 PM

*C-RASC consists of researchers from George Mason's Volgnau School of Engineering , the School of Business, the Schar School of Policy and Government, the Jimmy and Rosalyn Carter School of Peace and Conflict Resolution, the College of Science, and the College of Heath and Human Services

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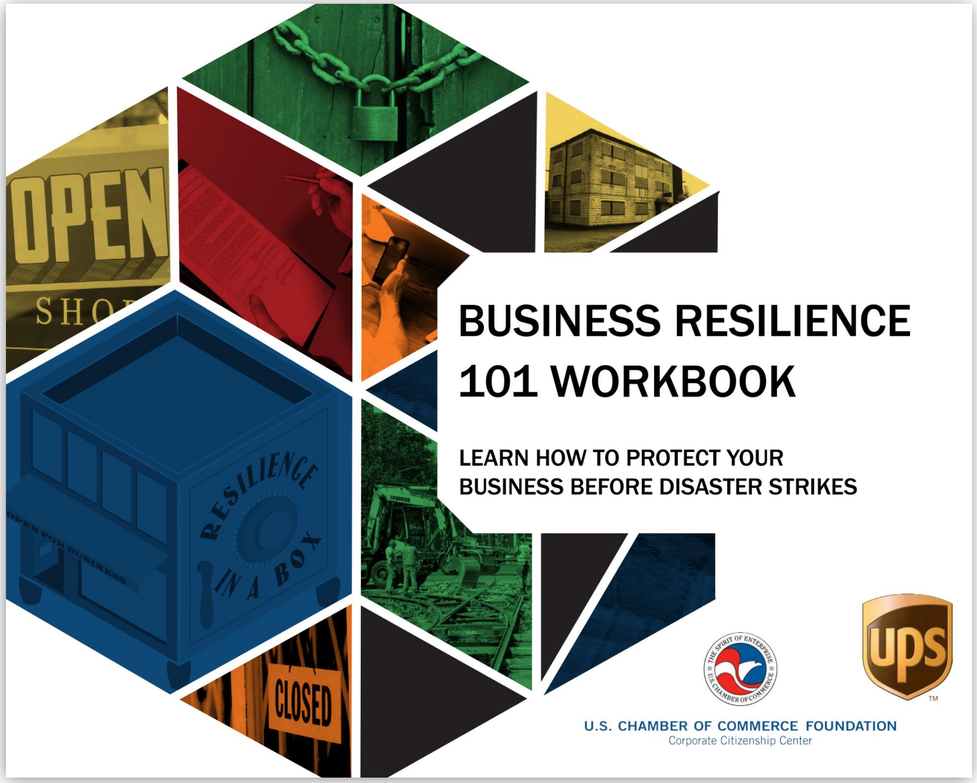
Lesson 2, 3 & 4 Overview

Complete Your Resilience Plan

- **Lesson 2,** Protection of People, Data, and Operations
- **Lesson 3,** Protection of Inventory, Equipment, and Buildings
- **Lesson 4,** Integrate Material from Lessons 2 & 3; Discuss “Adapt & Reposition;” Finalize Resilience Plan



Lesson 2

Protection of People, Data, and Operations

Your Six Critical Business Assets

Questions?

Back-up

Small State Example (e-Estonia)

- "The most advanced digital society in the world"—Wired magazine
- Sustained journey < https://e-estonia.com/>

  1994 1st draft of "Principles of Estonian Information Policy

  2000 e-cabinet meeting

  2007 cyber security

  2014 e-residency

  2019 AI strategy

- Digital Mode, Seamless State: Government as a platform

  -- Upholding ideals of democracy and personal privacy

Small State Example (Denmark)

- **One of world's most digitalised countries**
  - Most transactions cashless
  - Almost all interaction with the Danish authorities take place online
- **"Digital by default" – paper only as last resort**
- **High-level broadband penetration**
- **Data security is high priority**
- **Set up business online in 24 hours**
- **Most public health services online**
- **Digital payments transfers directly to citizens**

From information society to network society

https://denmark.dk/innovation-and-design/digitalisation

Small State Example (Singapore)

Singapore Smart Nation Key Pillars

- **Digital Economy**
- **Digital Government--** Digital to the Core, and Serves with Heart"
- **Digital Society**

People, companies and public agencies

- Singapore < https://www.smartnation.gov.sg/>