



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

Lesson 6

Completed Resilience Plan, Case Studies, Innovative Industries,
Resilience Industry, Life-Long Learning, Networking, Wrap-up



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 25, 2020 6:00pm-8:00pm

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

*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 Health and Human Services

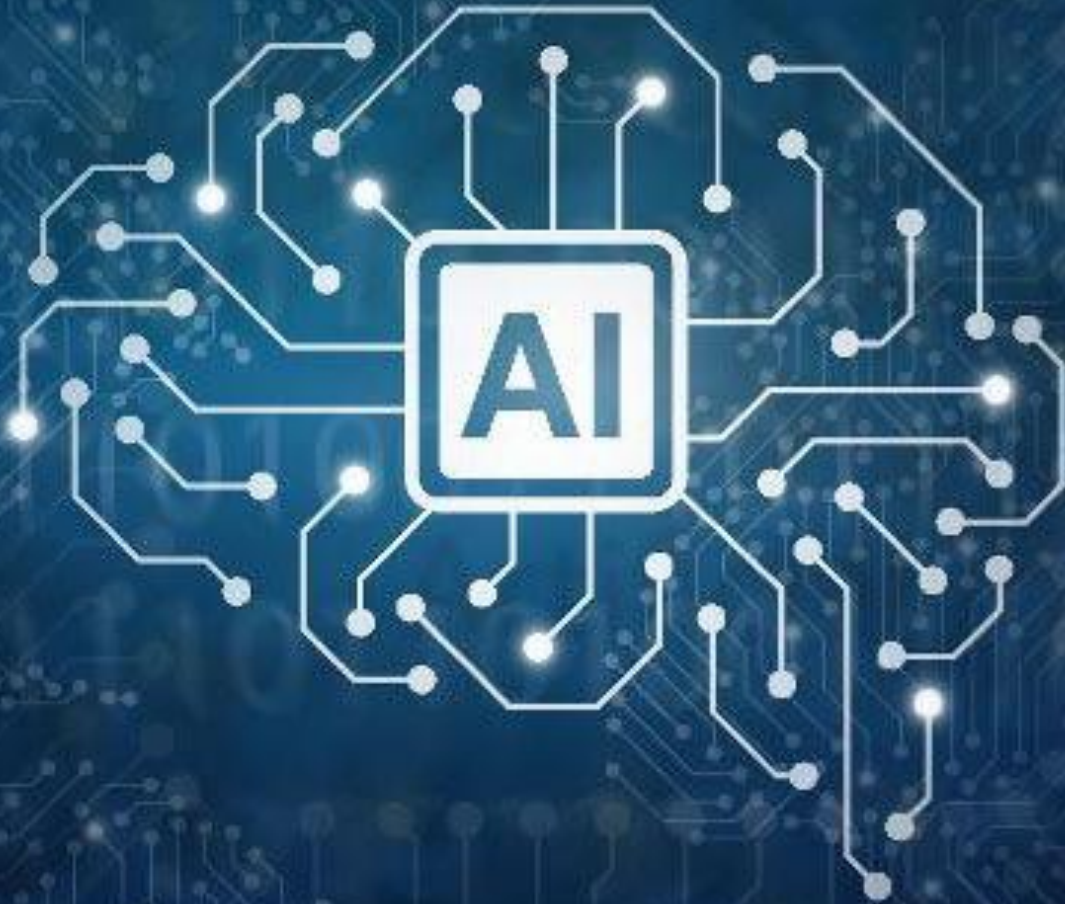


Agenda

- Resilience Plan Review
- Resilience Case Studies
- Digital Puerto Rico
- Micro-Manufacturing and Puerto Rico
- Connecting Farm, City and Technology:
Transforming Rural, Peri-Urban and Urban
Food Ecosystems in Puerto Rico
- Resilience Industries
- Lifelong Learning Strategy for Puerto Rico
- Value of Networking
- Wrapup

Your Six Critical Business Assets





Resilience Case Studies in Puerto Rico

Wovenware & Brain Hi & Parallel 18
(PRSTRT)

Wovenware – Hurricane Maria



Anticipate

- Spent 3 Years Preparing Shelter for Staff & Families
- Moved to Larger Facility
- Increased Server Redundancy
- Bought a Generator



Withstand

- Office Sheltered Employees & Families through Hurricane
- Provided Food, Water, and Internet Access

Wovenware – Hurricane Maria



Recover

- Created Work Protocols for Teams Operating in Remote Locations when Office Lost Power
- Communications Protocols to Remain in Touch with employees, customers, and stakeholders was a priority



Adapt/Re-Position

- Emotional Support with 8:30 AM Check-Ins
- CEO Christian Gonzalez Committed to Planning & Crisis Management Drills

Brain Hi



Anticipate

- Started in 2017
- Founder Emmanuel Oquendo
- No Prior Business Experience
- Saw Need to Automate Restaurant Reservations
- No Plan for Hurricane



Withstand

- Hurricane Maria Struck Sep 2017
- Lost all Power to Build Code for his Idea
- Lived in Parallel 18 (Accelerator) Offices for 45 Days
- Completed Code
- Signed 1st Client for \$250/mo

Brain Hi



Recover

- Doctors Offices and Medical Facilities became primary customers
- Pivoted to “virtual answering service and appointment scheduling”
- Grew to 400 healthcare customers after the Hurricane



Adapt/Re-Position

- Improving the virtual answer and scheduling to “virtual scheduling, wait room, appointment setting & doctor communication system.”
- Repositioning themselves as the go-to appointments and scheduling service for next hurricane.

Parallel 18 Accelerator (PRSTRT)

- Founded in 2017 as Part of the PRSTRT
- Sebastian Vidal, Director
- Worked with over 200 tech-based start-ups
- Goal to provide funding & technical assistance to emerging start-ups
- Goal is to Create Entrepreneurial mindset in Puerto Rico

**BUSINESS
ACCELERATOR.**



Parallel 18 Accelerator

- Hurricane Maria and Accelerator lost power for 3 Days
- Building was used as a shelter for many entrepreneurs
- Goal after Hurricane to double class size to 80 candidates for 5 weeks; 2 classes per year
- Accelerator has resilient mindset which it instills in every entrepreneur



Digital Puerto Rico And Resiliency Innovation Network

June 2, 2020

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**

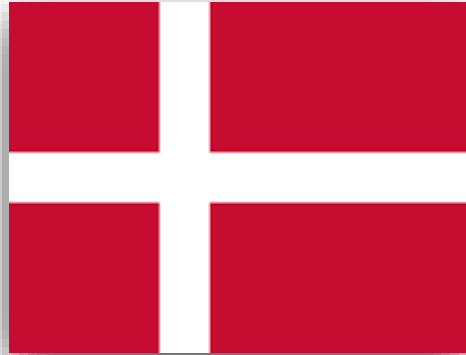


Small State Examples



Estonia

Population: 1,329,000



Denmark

Population: 5,792,202



Singapore

Population: 5,850,342

e-Estonia

- **“The most advanced digital society in the world”—Wired magazine**
- Sustained journey--since 1994
- Digital Mode, Seamless State: Government as a platform
 - Upholding ideals of democracy and personal privacy

Denmark

- One of world's most digitalised countries
- **From information society to network society**

Singapore

- **Singapore Smart Nation Key Pillars:** Digital Economy, Government Society
- People, companies and public agencies

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

PCI “Digital Puerto Rico” Initiative 2018

- 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)

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/>

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**

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)
- **Annual Resiliency Innovation Conference in Puerto Rico**
 - **Resiliency innovation facilities on many universities**

Potential Resource

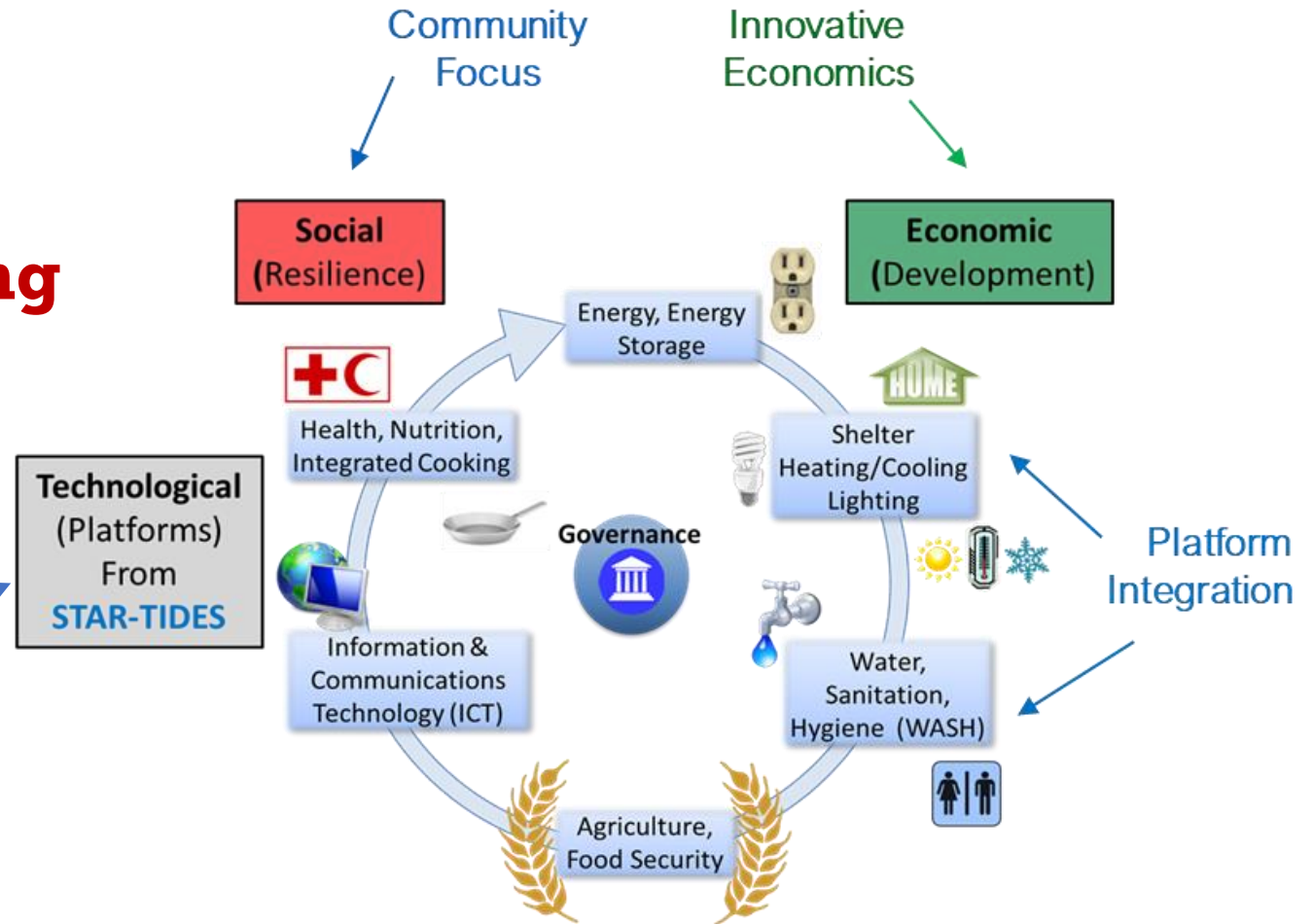
Listening, Learning, Lasting

Knowledge Sharing

via **STAR-TIDES** network



Trans-Disciplinary Research and Teaching are Key



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

Stability/Security ↔ Sustainability

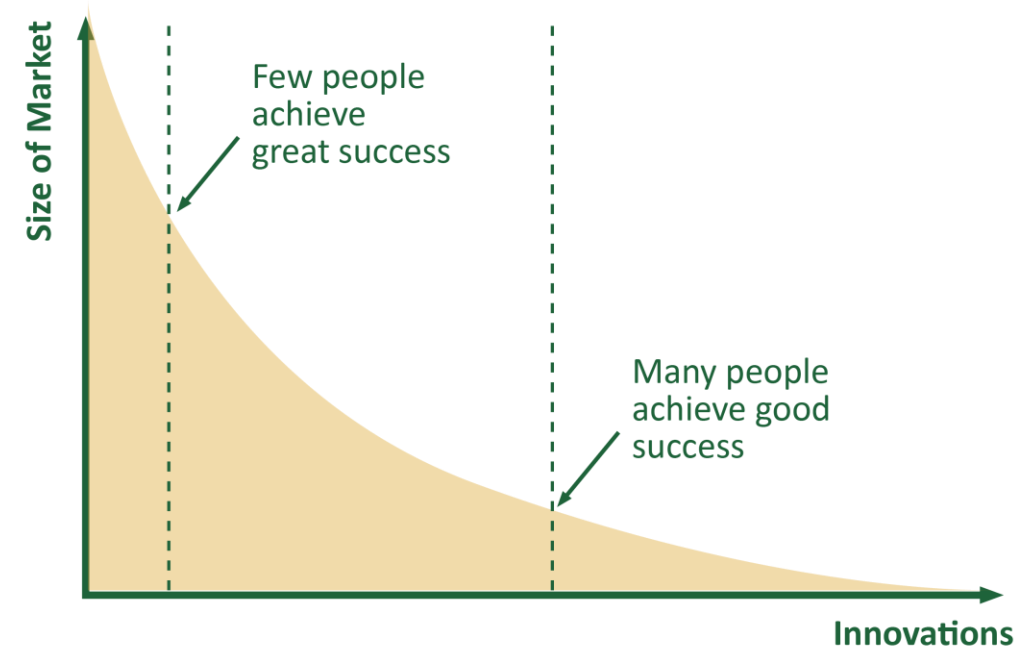
Summary

- **Planning and execution of Digital Puerto could extend beyond political turnovers**
 - **Examples from small countries**
- **Exceptional benefits**
 - **Especially now**
- **Need ALL your help to pull it off**

Micro-Manufacture (M2) and Puerto Rico

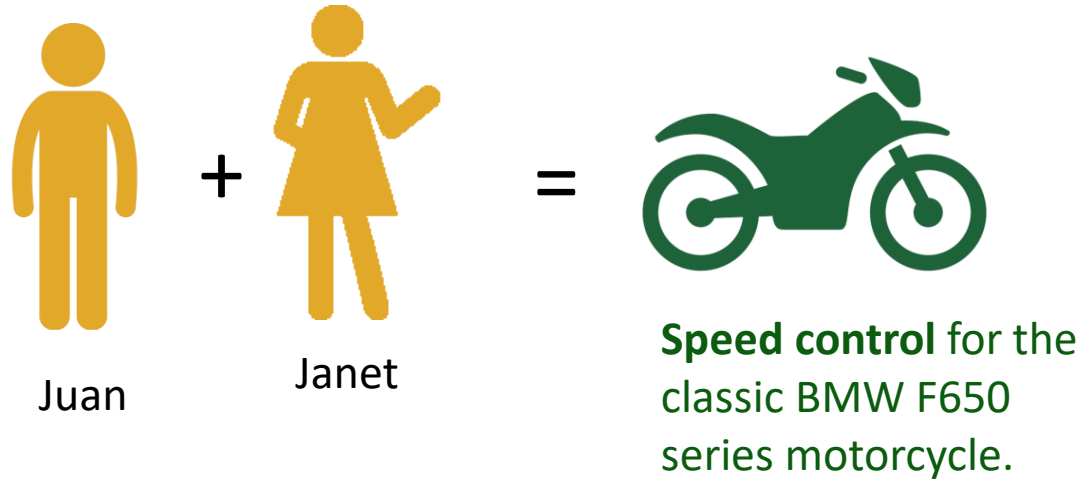
Concept based on research proposal led by Dr. Francis Quek at Texas A&M (TAMU)

- Society-wide grand challenge: Create jobs and provide meaningful work in manufacturing
- In long-term: Understand implications of Micro-Manufacture across engineering, business, economics, law, and policy
 - Including cross-linkages and dependencies across fields
- Move from today's economy where "few achieve great success to one where many achieve good success"

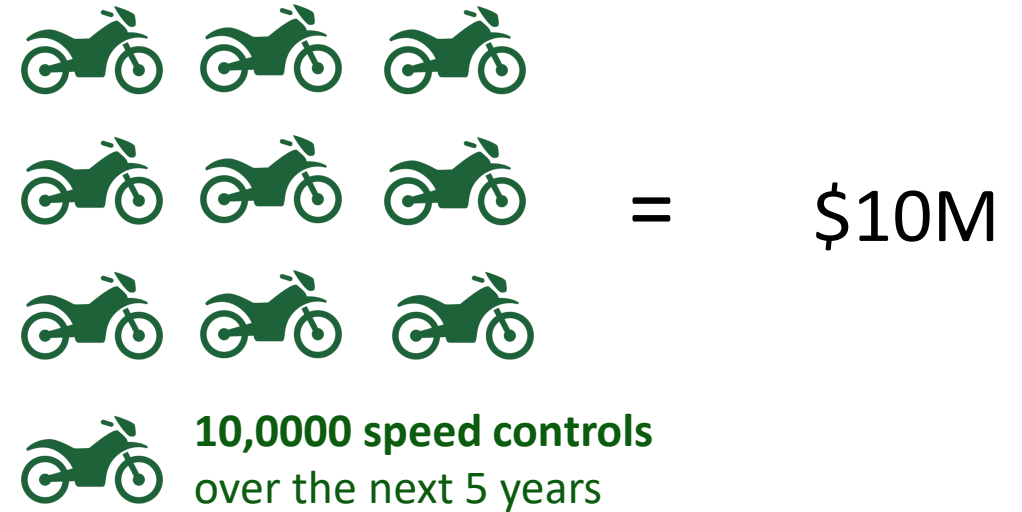


*Changing the game by shifting the line
of entrepreneurial success*

Micro-Manufacturing Example



Juan is a designer and Janet is a Computer Scientist. Juan rides a motorcycle and is aware of the aftermarket demand in the motorcycling community. They design an advanced speed control for the classic BMW F650 series motorcycle.

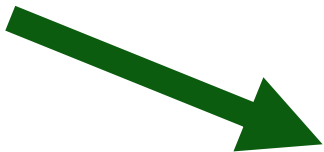


They believe they can sell 10,000 speed controls over the next 5 years, which amounts to total sales of \$10M if they price their invention at \$1,000 each.

Micro-Manufacturing (M2)



\$\$\$\$\$



Juan

+



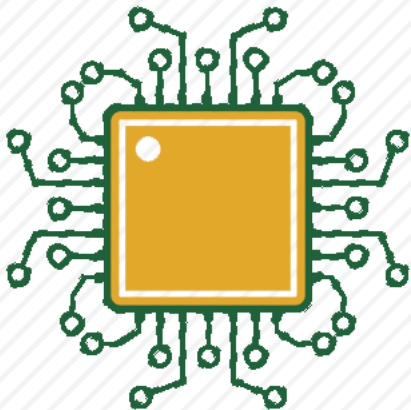
Janet



10,000 speed controls
over the next 5 years



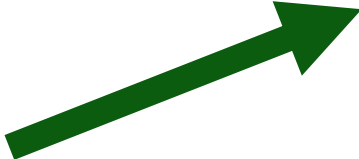
Jack



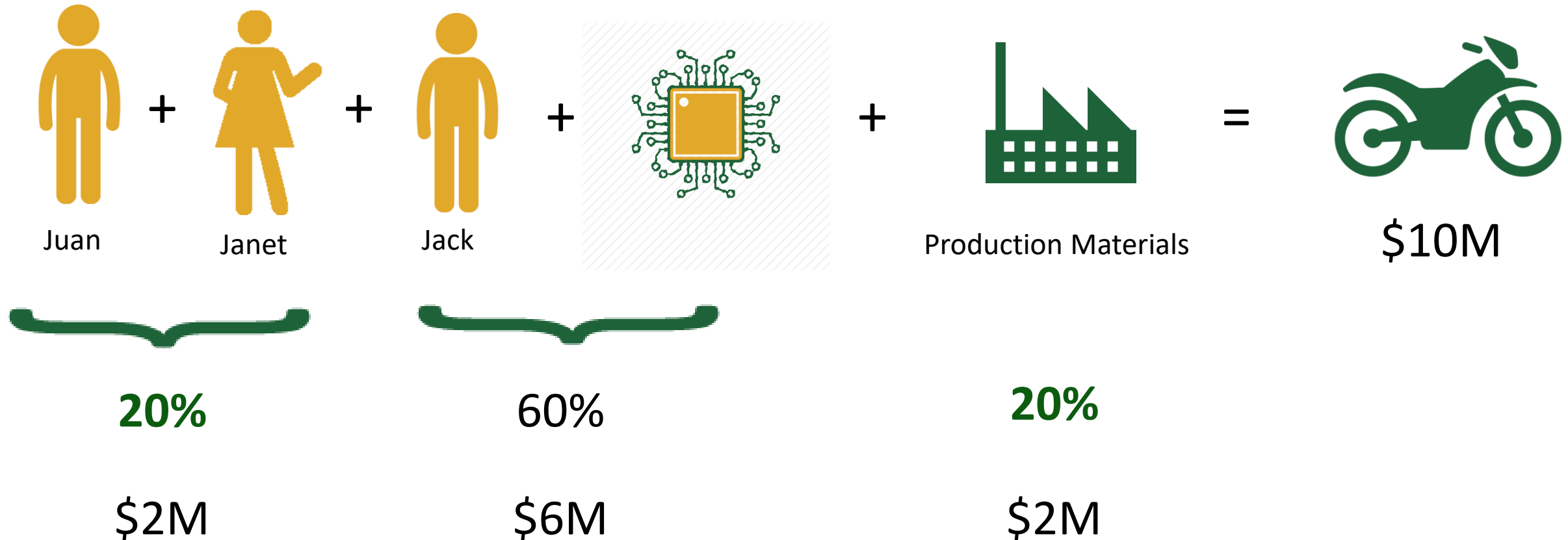
Nearby M2 Business



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Micro-Manufacturing (M2)



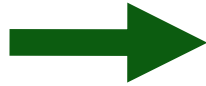
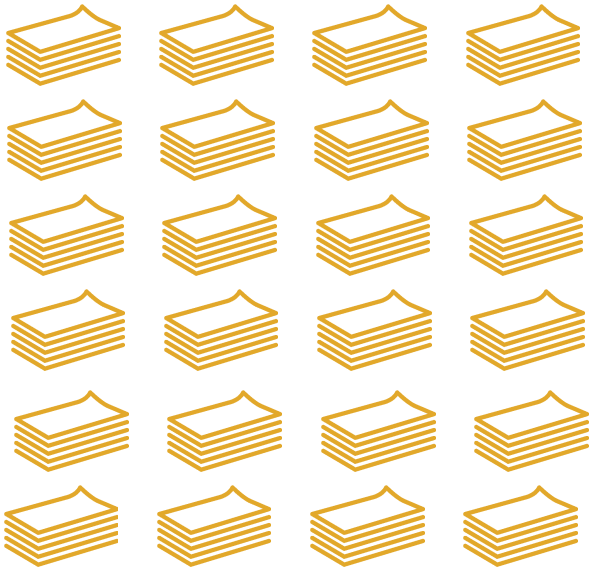
Desktop Publishing Analogy

- In 1984 Lisa and Macintosh computers and ImageWriter printer let bit-mapped graphics be translated to paper
- Low-cost, high-quality inkjet and laser printers led to personal desktop publication in 90s
 - Democratized printing over mass-production offset printing
 - Small restaurants could now design and print their own menus
 - But even modest high-quality color printing projects were complex and costly
 - Spurred growth of community printing businesses like Kinkos
 - Now many homes have a printer for occasional small quantity prints
 - Use Kinkos for large, complex or customized projects
 - Printing businesses like Kinkos in almost every U.S. town
 - Employing thousands of workers, providing invaluable services

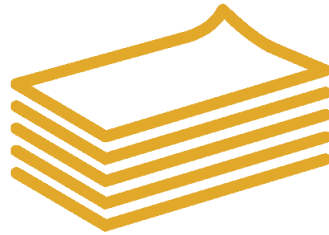
Desktop Publishing Analogy



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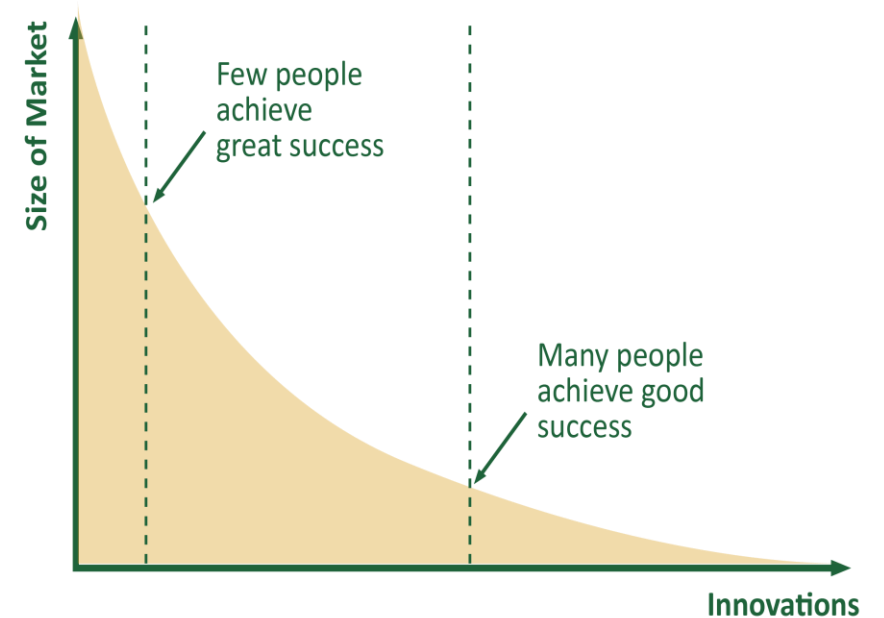


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Micro-Manufacturing Vision

- **M2 much more complex than desktop printing**
 - What does Jack's 'Kinkos of Manufacture' need to fulfill orders quickly?
 - What research gaps need to be filled?
- **Digital economy opens tremendous opportunities**
 - Flexible fabrication
 - Universal access to modern Internet
 - Social networking and intelligent information
 - Accessible electronics and programming
- **Together they can shift point of entrepreneurial success down the curve**
 - To enable success by many
 - More small innovators could make it to start-up, and scale



Changing the game by shifting the line of entrepreneurial success

Opportunities for Puerto Rico

- **Innovate with M2**

- Take advantage of new Internet capabilities like 5G and Starlink
- Build on Puerto Rico's manufacturing sector
 - Additive manufacturing is improving fast
 - Deploy M2 capabilities geographically

- **Build in cyber resilience**

- Gather not just tech data, but also economics, business, entrepreneurship, law, and policy
- Leverage re-shoring of U.S. supply chains
- Engage diaspora to add to skill base
- Use M2 pilots to justify distributed, stable power

- **Participate in TAMU and GMU research project**



Connecting Farm, City and Technology: Transforming Rural, Peri-Urban and Urban Food Ecosystems in Puerto Rico

Adapted from

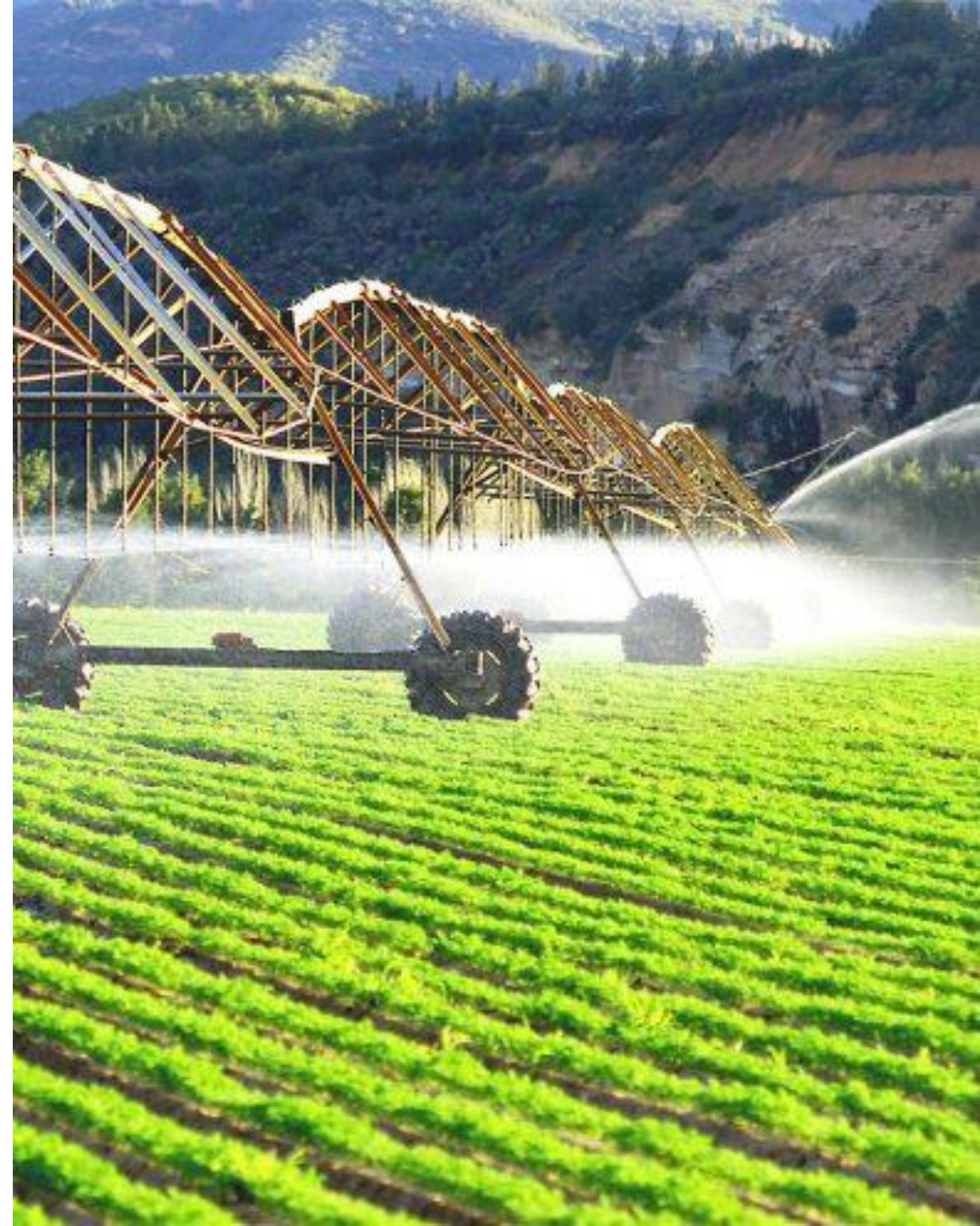
Fred T. Davies & Banning Garrett, *Connecting Farm, City, and Technology: Transforming Urban Food Ecosystems in the Developing World*, Global Federation of Competitiveness Councils (GFCC), 2019

<http://www.thegfcc.org/wordpress/wp-content/uploads/GFCC-ConnectFarmCityTech-Report.pdf>



Agricultural Modernization in Puerto Rico

- **Modernize agriculture to promote greater productivity and output and improve exports**
 - Puerto Rico imports about 80% of its food
 - Agricultural sector suffers from:
 - Lack of critical mass
 - Outdated farming practices
 - Aging workforce
 - Insufficient access to capital
 - Distribution system also fragile
 - Needs
 - Sustainable water sources and integrated management
 - Improved transportation infrastructure
 - Enhance resilience to drought and climate change
 - COVID-19 recovery plans

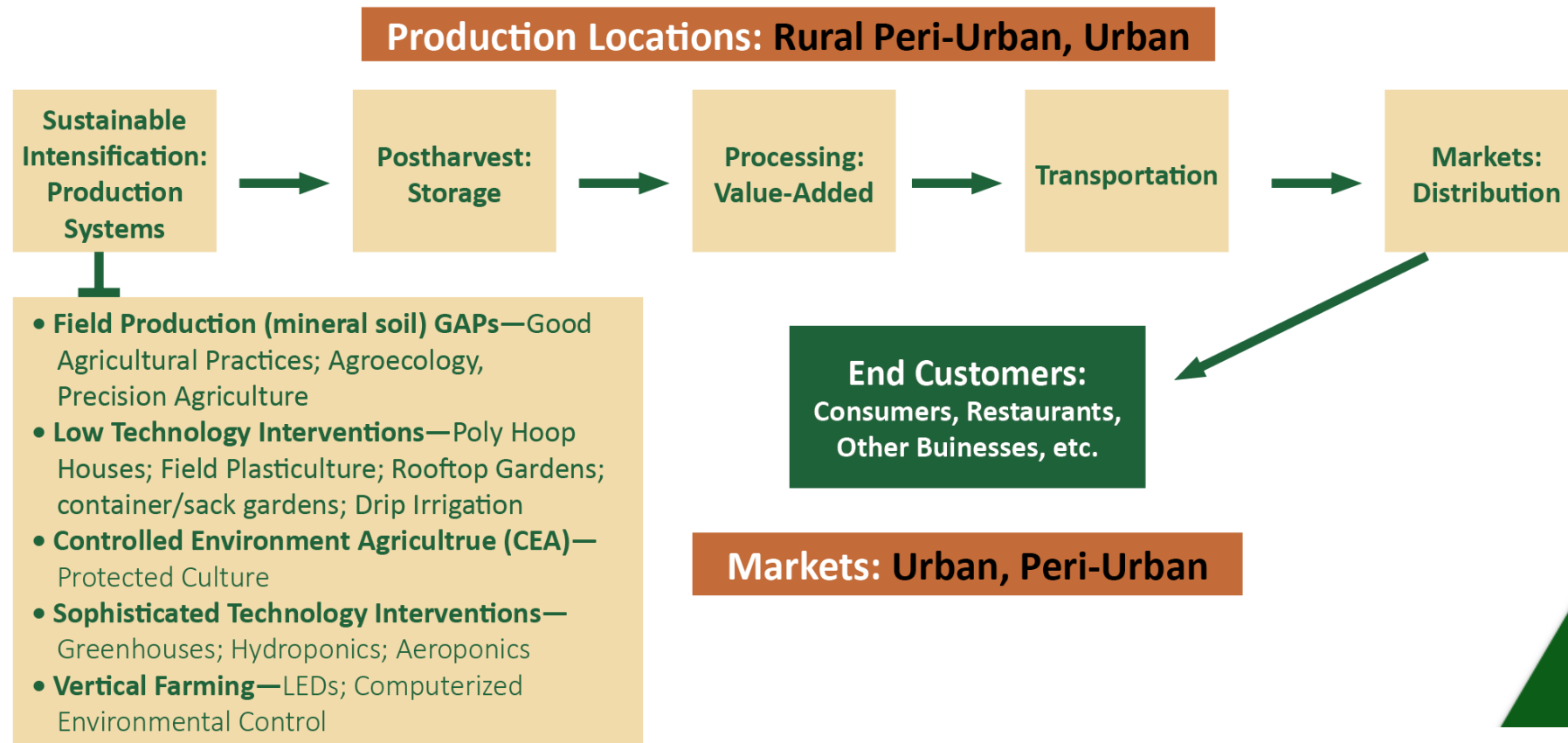


Connecting Farm, City, and Technology: Transforming Urban Food Ecosystems in the Developing World

Fred T. Davies & Banning Garrett



The Rural/Urban Food Value Chain



Technology-Led Solutions Can Advance Urban Food Ecosystems for the Developing World

“Holistic Approach”—Using Technology to connect the nexus of food water, energy, nutrition, medicine, health (people/nutrigenetics, plant, animal), sanitation, education, behavior change— **with sustainable intensification of urban food ecosystems**—integrating urban, per-urban and rural environs.

1. Connectivity: Info Delivery & digital Technology Platforms: ICT, IOT, Mobile Money, Finance	2. Oversized Services: Producers to Consumers	3. Precision Agriculture: GPS, IOT, AI, Sensing Tech	4. CEA—Controlled Environment Agriculture: Protected Culture, Vertical Farming
5. Blockchain: Traceability, Food Safety (Postharvest), Personal Identification	6. Solar Electric: Energy, Micro-Grids & Storage	7. High Quality Enhanced Seed: Hybrids, Climate & Pest Resilience	8. Enhanced Genetics: Gene Editing, Synthetic Biology, Cloud Biology
9. Biotechnology: Microbiome Editing, Soil Biologicals, Alternative Proteins, Plants as Factories for Drugs, Meat Substitution	10. Nanotechnology & Advanced Materials: Seed Coating, Disease Control, Postharvest, etc.	11. 3D Printing/Additive Manufacturing: Food parts production, Machinery, Structures	12. Intervention of New tech with Underutilized Tech: “On-” and “Off-Grid” Usage, i.e. Precision Soil Sensors & solar pumps integrated with efficient drip irrigation, “Packaging Technologies”

<http://www.thegfcc.org/wordpress/wp-content/uploads/GFCC-ConnectFarmCityTech-Report.pdf>

Impact

- Increase diversity and yield of crops
- Reduce distribution losses
- Use MUCH less water
- Implement world-class farming practices
- Attract young people (cool tech)
- Increase resilience to severe weather and climate change
- Distribute more stable energy and comms
- Attract capital
- Increase demand as well as supply

These address most of Puerto Rico's agricultural modernization needs





Building a Resilience Industry



Kansai International Airport, Typhoon Jedi Source: BBC



Kansai International Airport, Typhoon Jedi Source: Bangor Daily News



SUSTAINABLE INFRASTRUCTURE SERIES

LIFELINES

The Resilient Infrastructure Opportunity



Stéphane Hallegatte
Jun Rentschler
Julie Rozenberg

Building a Resilience Industry



Lifelong Learning Strategy for Puerto Rico

**(thanks to Dr. Dr. Andria Salva
and SHRM)**



Image source:
<https://www.pinterest.com/pin/703756170248929/>

Alliance of Key Influencers



47TH SHRM-PR
CONFERENCE &
EXPOSITION

SAVE THE DATE!
AUGUST 12-14, 2020

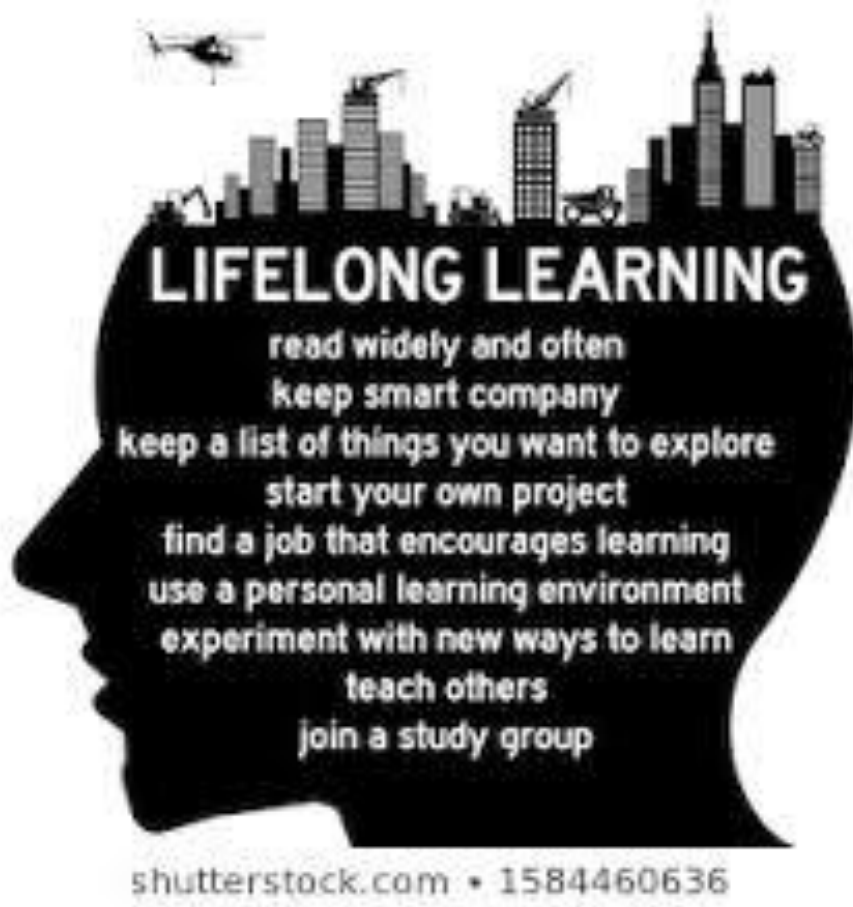
Awareness



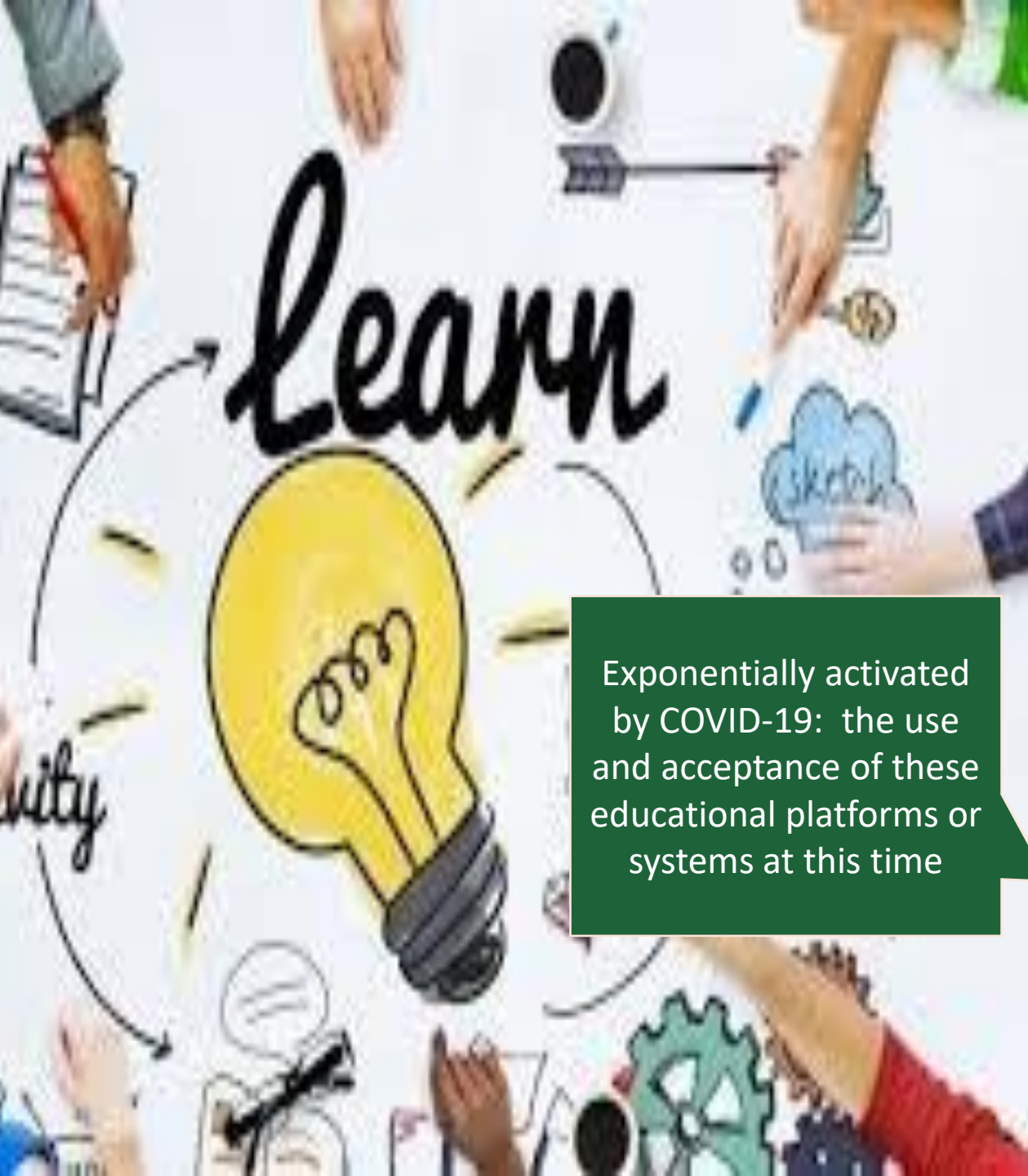
Lifelong Learning is becoming an essential economic imperative

- **4th Industrial revolution is accelerating**
 - Changing nature of jobs
 - Many more contractors, independent providers, one-person shop entrepreneurs, part-time status and other new work relationships
 - Altering the concept of a “job”
- **Artificial Intelligence creates additional challenges**
 - Roles for people
 - Numbers of people
 - What skills, and how to update them
- **Tech change demands stronger and more continuous connections between education and employment**
 - Huge opportunity for creating learning spaces
 - e.g. Coursera, edX or the use of platforms such as ZOOM, TEAMS, and others
 - Connect and promote learning in different ways

Challenges



- By 2027, World Economic Forum anticipates 50% of workforce will depend on entrepreneurship
- **Aging Puerto Rican population**
 - needs supplemental income for senior years
 - **Need to reskill and upskill adult population ASAP** to facilitate transition to new work “order”
- Need to evolve current curriculum and educational methods to prepare next generation for changing world
 - Critical to insert lifelong learning elements
 - Curiosity
 - Willingness to learn
 - Be open to changing approaches and similar strategies



Exponentially activated
by COVID-19: the use
and acceptance of these
educational platforms or
systems at this time

Desired State

- Single **economic development** PLAN to transform education: Crib-to-Retirement
- Empower individual through lifelong learning skills to live a continuously productive and fulfilling life
- Evolve and leverage educational institutions resources to serve population throughout their lifetimes
 - Schools to serve parents and neighboring community
 - Universities to serve adult population and industry reskilling and upskilling efforts
 - Industries to serve as development centers for their sectors
- Train parents to develop lifelong learning values and skills in their children and significant others
- Leverage online education capacity to facilitate access



Next steps

- **Q4 2020: Reframing SHRM project in doable and actionable steps**
 - Create, develop, and implement strategy at different levels
- **Key industry sectors** work on Competency Maps and identify key needs for next 3-5 years.
- Develop **coaching support system** to enhance career orientations at high school, college and industry specific roles--expanding scope of opportunities
- **Identify funding sources** and incorporate key sectors in achieving specific goals in this time frame
- **Create flexible, resilient plan:** accommodate changes in strategy and respond to newly created approaches
- **Entrepreneurs will especially benefit** from a lifelong learning mindset
 - Support continuous growth and pivot as challenging times demand



5 Keys to Successful Networking

How to Stay Connected
in a COVID-19 World

Why is Networking Important?

- Enables you to find resources for your company
- Helps generate customers and leads for contracts
- Helps you identify suppliers, partners, and employees
- Increases your visibility in your profession or local community



What is the best approach to networking?



- Give more than you get
- Be genuine when you connect with people
- You do not need to be an extrovert to network
- TIP: Social Media makes it easier to stay connected!

Are You an Introvert?



YES!
I AM AN
INTROVERT

This Photo by Unknown Author is licensed under CC BY-NC

- It takes skills to become a good networker for both introverts and extroverts
- Key techniques include doing research before the event: Who is speaking? Who is attending? What connections do you want to make at the event?
- Extroverts do not have the advantage over introverts

5 Keys to Successful Networking

- Determine your target audience
- Identify which events or conferences to attend
- Be visible online to help build your network
- Stay connected to your network through social media
- Measure your networking effectiveness



Determine Your Target Audience

- Start with coworkers, friends, neighbors & family
- Join Trade Associations
- Join Chamber of Commerce
- Join Community Organizations
 - Coach Baseball or Softball
 - Volunteer at school activities
- Serve on Community Boards





Business Chambers & Trade Associations

Chambers

- PR Chamber of Commerce
- PR Chamber of the South
- PR Chamber of the West
- PR Manufactures Association

Trade Associations

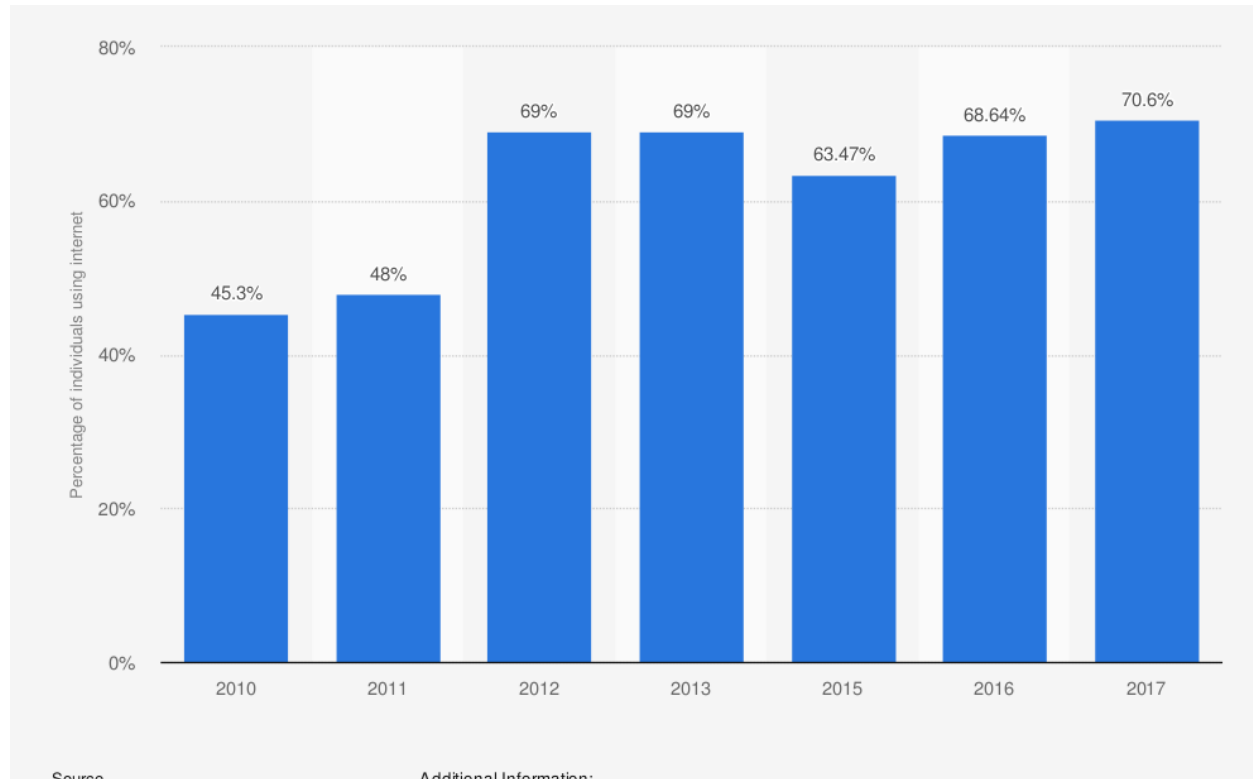
- ASORE (restaurants)
- ACDET (retail)
- MIDA (food distributors)
- PIA (pharmaceuticals)
- CUD (retail)
- Hecho en PR (businesses that produce locally)

Identify which Events or Conferences to Attend

- There are more events than there is time for you to attend
- Choose the events where your target audience meets
- Consider limiting the number of groups you join to concentrate on two to three organizations
- Suggestion - join one of each:
 - Trade Association
 - Business Group
 - Community-Based Organization
- Get involved in committee work!



Be Visible Online to Build Your Network



Source

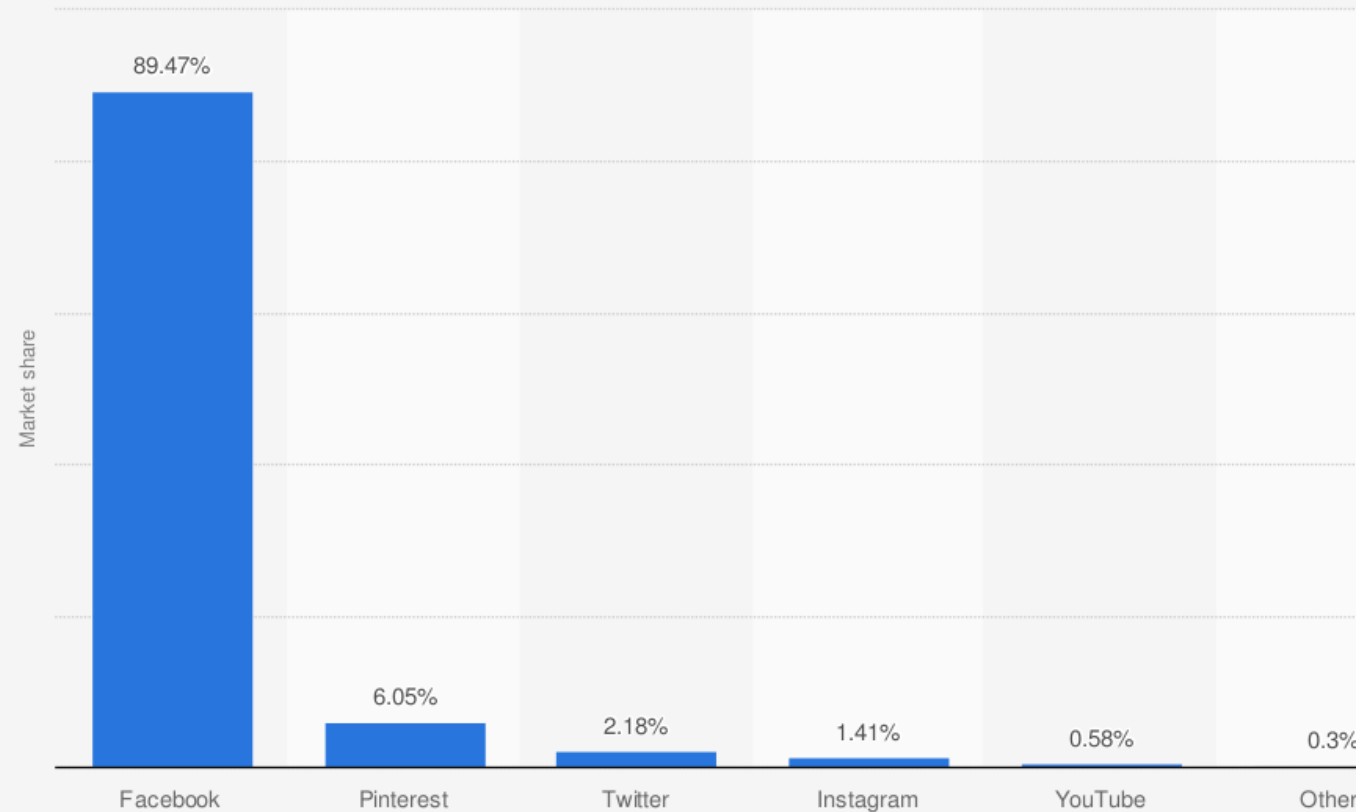
Additional Information

- 70% of Puerto Ricans used the internet in 2017. Because of COVID-19, there are more in 2020
- Most buyers check the internet before they make a purchase
 - Power of information has shifted from seller to buyer
 - Most buyers have already searched the internet before they buy
- Websites are where buyers go first to find B2B (Business-to-Business) information

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
- 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 professional digital marketing help

Most popular social media websites in Puerto Rico in 2019, based on share of visits

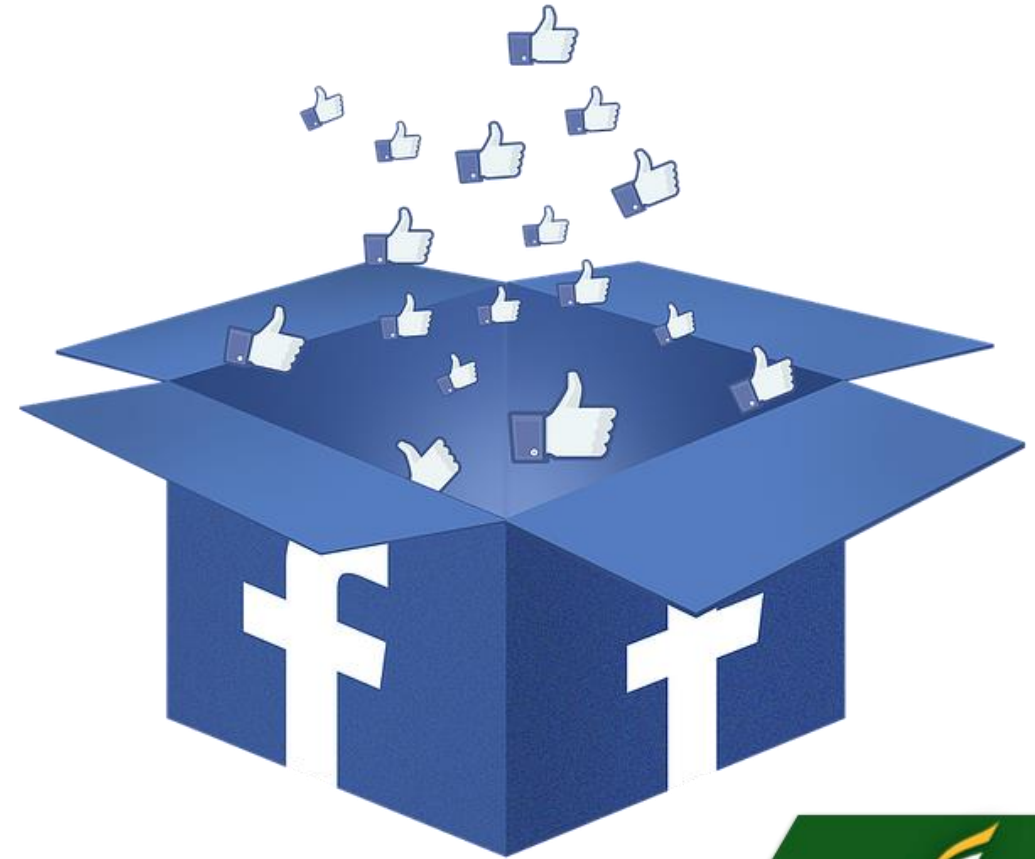


Source
StatCounter
© Statista 2020

Additional Information:
January to December 2019; Including mobile, tablets, desktop and consoles.

Measure Your Networking Effectiveness

- Set clear goals for the number of connections per week
 - In-person Goals (After COVID-19)
 - Social Media Goals
 - Website Visits (Google Analytics)
- Develop a content calendar for your target market
 - Don't sell; be helpful
 - Don't write ad for baby clothes; write Blog for mothers on how often to wash clothes



Bonus Key



- Practice inbound marketing techniques
 - Attract customers by creating valuable content
 - Inbound marketing connects and engages
- Become a trusted advisor to your target audience
- Study digital marketing techniques
- Learn to be a SME (Subject Matter Expert)

Questions?



Poll Question #1

- Do you have a website with your products or services prominently displayed?
- Yes
- No

Poll Question #2

Do you use your Facebook account in one of the following ways?

- Paid Ads
- Post Content Marketing Ads
- Write Blogs
- Post and share comments and “likes” on other people’s content
- I don’t have a Facebook account

Resources

(Services provided when you are a member)

- PR Chamber of Commerce
- PR Chamber of the South
- PR Chamber of the West
- PR Manufacturers Association

Professional associations specifically for engineers, Architects, CPA, Economists, Finance, Sales, Human Resources, etc.. UPR Alumni

- SBA
- SBTDC
- SCORE

Other Associations

- ASORE (for restaurants)
- ACDET (for Retail)
- MIDA (for food distributors)
- PIA (for pharmaceuticals)
- CUD (for retailers)
- Hecho en PR (for business that produce locally)

PRSTRT has additional resources

Summary

- Congratulations to all the members of:

• **Puerto Rico Team RBI 1**



- Key Points
 - Prepare to adapt
 - Build your team
 - Have your Grab-and-Go bag
 - Exercise your plan and keep it up-to-date
 - Look for opportunities
 - Embrace Lifelong learning
- Thank you
- Look forward to feedback



10-Question Quiz for Business Course

Question 1: What are the four phases of resilience?

Question 2: What are the 3 kinds of resilience?

Question 3: What is not part of “be prepared to bounce forward better”?

Question 4: Risk assessment is an integral part of resilience planning?

Question 5: What are the six key business assets that need to be protected?

Question 6: What does not need to be in a “Grab-and-Go” bag?

Question 7: Can a resilient team be done by one person?

Question 8: What is not a key element of adaptability?

Question 9: When is it necessary to pivot?

Question 10: After a resilience plan is completed what needs to be done?

Wrap Up Gloria and Annie