ASSESSMENT OF THE **INNOVATION AND ENTREPRENEURIAL ECOSYSTEM IN PANAMA**

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INTRODUCTION

The innovation and entrepreneurial ecosystem assessment study is a primary deliverable of Phase I of the program between The University of Texas at Austin, Texas Global, Global Innovation Lab and Fundación Ciudad del Saber Panama (CDS). The overall program is designed to support the expansion of a high-impact incubation ecosystem in Panama, fostering an environment for the creation and growth of robust global entrepreneurial ventures. The assessment provides insight and direction for additional training and actions in Phase I as well as Phase II programmatic engagement in addition to the Innovation Readiness® and Incubator Management training sessions.

PROPOSED OBJECTIVES

1. Examine regional strengths and challenges for accelerated innovation-based growth;
2. Understand the current ecosystem supporting entrepreneurship;
3. Link capabilities and assets to existing or future strategies for growth;
4. Provide actionable roadmaps for sustainable technology-based growth; and
5. Suggest measurements to follow progress and outcomes of programmatic recommendations.

INVESTIGATIVE STRATEGY

The innovation and entrepreneurial ecosystem assessment has three components:

- A truncated regional asset map;
- A qualitative assessment derived from stakeholder interviews in government, corporate start-up, education, and support institutions; and
- In-country immersion visits to key institutions.

EXECUTIVE SUMMARY

This study highlights key opportunities and strategies to enhance the growth and economic impact of the entrepreneurial ecosystem in Panama. Several Panamanian asset sets were considered within a regional and global context and in view of key trends impacting the country. We reviewed key assets and identified important trends that would impact entrepreneurship in Panama. Subsequently, we interviewed significant ecosystem stakeholders. Our experience in various ecosystems around the world and the qualitative data we gathered in Panama guide our recommendations for actions steps that will impact the growth and health of the Panamanian entrepreneurial ecosystem. With carefully selected economic goals, this ecosystem will bolster the exchange of innovative ideas for selection, growth, and an increase in startups thereby contributing to greater wealth.

Texas Global submits this report to Ciudad del Saber detailing findings on the status and future strategies for building an innovation and entrepreneurial ecosystem in Panama. The study was comprised of three parts:

1. Brief review of country assets considering key international and regional context and post-pandemic economic trends;
2. Engagement of 75 individuals representing distinct industries and institutions throughout Panama; and
3. Three case studies to illustrate a successful startup archetype, Panamanian student perspectives of startups, and a significant innovation support program.

KEY OPPORTUNITIES IDENTIFIED

Panama could serve as a leading innovation site for domestic and international supply chain and logistics technologies as expressed through sea, air, road, and internet. However, this opportunity is highly time dependent as international shipping, competitive cities/locations, and global investment threaten Panama's position. Creating international partnerships between leading startup hubs in supply chain, logistics, and data science will be an important first step. What will draw these hubs to Panama? The motive force should come from opportunity to test solutions with Panamanian anchor companies, COPA, the Canal Authority, and other strategic supply chain and logistics partners. This approach replicates the "Plug-and-Play" collaboration with Northwest Arkansas and engagement with Walmart, J.B. Hunt, and Tysons. An open innovation strategy offers opportunity to "unlock" established industry to new types of business deals and interactions while positioning Panama to lead, in the regional logistics and data arms race. Government policy to incentivize "open innovation" with Panamanian innovators, small and medium companies, as well as international startup hubs will ease this transition.

Panama should consider strategies to further diversify its economic strategy beyond a logistics hub to a tourism hub. This offers immediate synergies through capture of offshoring time of existing shipping crews, and luring travelers to spend one or more days in Panama during international travel, rather than using it as a connector to an ultimate destination. What would draw these visitors to Panama as opposed to other sites within Latin America and the Caribbean (LAC)? First, would be convenience of a "hub" approach to tourism coupled with improved promotion of the varied and beautiful cultural experience available. For example, linking Panama's rural strength in agriculture and rich diversity of indigenous peoples with university research capacity and international tourism goals, provides significant synergy for turning raw agricultural products into world-class finished goods, a ready testing-site for products through tourists, and new manufacturing and branding exercises international distribution. The success of the Panamanian coffee industry provides a template for this approach, and government policy should incentivize not tax these efforts for linking, synergy, and finished product realization.

Panama's role as a shipping and transportation hub coupled with its highly evolved financial institutions and memorable natural sites can be leveraged to attract talent to this "Tropical NYC." Talent attraction through internships and influx of college graduates offers access to computer and data scientists from the U.S. and other nations to fuel supply chain and logistic startup innovation and growth. These short engagements would be expected to grow to longer term employment relationships providing a stopgap of talent as the Panamanian K-20 (kindergarten-college) educational system continues to strengthen.

Innovation, invention, and entrepreneurship must become cultural hallmarks of Panama. Empowering startup support groups to collaborate with the K-20 educational system offers leverage to develop short-term entrepreneurship programs more rapidly, stimulate STEM education engagement, and provide advanced skills to students through internships and participation in the ecosystem. The Panamanian educational system must be enhanced to provide synergistic learning and skills development. The timing and coordination for these changes will be lengthy. Engaging with startup support groups can accelerate the change by working with the willing to make necessary changes in attitude, thinking, and skill expression. Finally, these startup support groups should be available for must where Panamanians innovators aggregate in Panama City, David, Colón, and rural regions. Empowering the organizations to actively engage rather than to be engaged is key. As an example, it is worthwhile to consider amplifying the potent impact of Ciudad del Saber by creating a physical presence in the center of corporate life in Panama City. A word on play with a "Ciudad del Sabor" – uniting knowledge with flavor - an acceleration/incubation center by day and a cultural epicenter including a farm-to-table destination restaurant by night would help link rural with city, innovators from companies and startups, innovation with tourism, creating a highly leveraged multifaceted offering that could be world-renowned in originality and impact.

Our findings did not indicate that Panamanians, in general, are encouraged and empowered to be creative, inventive, and innovative. For the transformation of Panama from a successful traditional industry, agricultural, and financial economy to become innovative and highly competitive as the world moves to be data-driven and prediction-oriented, the people of Panama are key. Investing in them to think creatively, conceive invention, mold innovations, and scale new companies and industries is critical for the future. Panama must grow innovators, incentivize its institutions and wealth to assist with private funding strategies, and engage its industry to accept and commercialize innovation collaboratively. This opportunity requires development of a new mindset, building of trust – government to industry, industry with innovators, etc., and engagement with agreed regional values to unite the citizens – rural and city, and draw in expertise from the outside to enhance innovative outcomes. The government cannot provide all the funding for an entrepreneurial ecosystem – it must set a policy that encourages its citizens to join, co-invest, and benefit from what is jointly built. In sum, invest in people, education, and create incentive strategies to promote participation, collaboration, and innovation.

KEY CHALLENGES IDENTIFIED

The key opportunities identified above reflect systematic approaches to address challenges identified and these include:

1. For Panama to be a world hub, it must integrate invention and innovation into its economic practice. Business will be won and lost based on efficiency, transparency, and facility.
2. It is crucial for Panama to not solely rely on the presence, capacity, and importance of the Panama Canal in world economics to move the nation forward with entrepreneurial innovation. Currently, there appears to be little "incentive" to innovate supply chain and logistics. Considering global competition, we strongly recommend immediate and systematic engagement in data-driven supply chain and logistical innovation from university, anchor company, government, and the startup community.
3. Large companies seem slow to innovate and they struggle to engage in open innovation with the startup community.

4. The K-20 educational system is traditional thereby focusing less on encouraging creativity, invention, innovation, and the support of faculty or student startup interests.
5. Talent access for new and creative technology companies is lacking in Panama.
6. IT innovation – web, social, app, etc. – dominates the startup scene with inadequate depth in logistics/supply chain, engineering, and medical technologies where there could be more fitted opportunities.
7. Startups are relying on foreign connections and programs to find funding, market, and scale.
8. Panama is increasingly recognized as a top retirement destination; however, tourism is not promoted aggressively, nor is it coordinated and integrated across Panamanian institutions– showing many gaps from marketing to experience. There is ample room to grow with a strategic, coordinated policy, innovation, and programs.
9. SENACYT and Ampyme offer many good programs – but interviewees spoke to the "paperwork" being very time-consuming and sometimes viewed as a detriment to impact.
10. Ciudad del Saber is a highly successful startup hub that should be grown further with stronger industry collaboration and programmatic focus.
11. Distribution of startups and founders as well as support, market, opportunity, and individual participation illustrates the deep gap between urban and rural areas. Much is to be gained with the adoption of an integrated strategy.
12. Funding and market access is not readily available through angel funders, corporate collaborations, or equity offerings.
13. Governmental turnover and inconsistency have been a "killer" in Panama for education and innovation reform – each administration turns over previous policies and continuity has been a struggle. SENACYT is considered one of the most consistent governmental units in terms of goals, policy, and programs.
14. Most country leaders and startup leaders were educated outside of Panama – this has given them the skills, confidence, and entrepreneurial bent. Nonetheless, this is approach is not scalable. Opportunity and entrepreneurial mindset and practice must be scaled in country.

RECOMMENDED INTIATIVES

To be a "Hub of Hubs" for the shared benefit of all Panamanians, Panama must link to the education, talent and places of innovation and entrepreneurship to have a spillover effect throughout the population and not just aggregate into larger corporate centers or foreign-owned businesses. As such, we recommend the following:

1. Integrate an "Idea-to-Product" course in each public (and private) university to engage multi-disciplinary students in innovation and entrepreneurial mindset training:
    a. Engage anchor company sponsors to provide problem statements;
    b. Create solution sprints in the context of a semester course taking students through the processes of 1) Creativity; 2) Invention; and 3) Innovation;
    c. Link "final" of class to pitch competition at each university—complete the first course;
    d. Offer a second course in entrepreneurship where best ideas (winning or placing in competitions) are developed into business models and minimum viable products (MVPs);

    As motivation for participation and excellence, an inter-university competition finishes the second semester for big Panama Innovation award – cash and access to Ciudad del Saber support. This links advancement in educational practice through teaching, incentives for

students to learn by doing, and drawing out solutions for anchor company consideration and funding.

2. Enhance entrepreneurial engagement of university students to grow native talent base:
    a. Creativity and innovation should be encouraged in all university programs, from STEM to arts and business. Entrepreneurial mindedness grows self-efficacy and independence for all graduating students;
    b. To assist with scalable startup creation, strengthening of STEM and humanities programs in universities is needed – this will take time building K-20 throughput to enhance creative and technical talent in Panama;
    c. A more rapid approach is to integrate experiential learning opportunities for Panamanian university students with startups and innovation programs in larger companies:
        i. "Painstorming" – problem definition for skills key logistics, supply chain and data science industries;
        ii. Creativity and Design processes – empathy-based solution shaping;
        iii. Entrepreneurial processes – shaping solutions to market needs to resolve problems;
        iv. Entrepreneurial marketing – helping startups link product and services to focused market fit; and
        v. Intrapreneurship – supporting innovation at established companies in region.

3. Develop a proof-of-concept space, where minimum viable products (MVPs) and other innovations can be realized:
    a. Creating a "Pecan Street Project" commercial scale incubator for supply chain and logistical technologies in Panama through collaboration with the Ports, Canal, Airport and major companies;
    b. Partnering with "Plug and Play" Supply Chain Center and other innovation hubs which work with international supply chain and logistics companies to offer a "place" and "funding" for in-Panama prototype testing;
    c. Drawing innovators from around the world to work in and launch products in Panama;
    d. Incentivizing anchor companies and industry (Canal, Airport, etc.) to actively participate and share profits of innovation with innovators and startups. A corporate alliance could be paid for through royalty pool or endowment of this initiative such as the Live Well Collaborative set up by Proctor and Gamble in Cincinnati.

4. Connect traditional Panamanian strength in agriculture and natural products with innovation incubators to enhance tourism, create spillover economic impact, and continued innovator engagement with their home region. Create a set of hubs:
    a. Culture/Arts + Food + Technology Hub – "Ciudad del Sabor"—connecting knowledge with Panamanian culture and a new culinary flavor:
        i. In the heart of Panama City, create a "Ciudad del Sabor" incubator outlet for networking and mentoring.
        ii. Link this incubator to a Panamanian culture/arts and food hub offering:
            1. Farm-to-table product outlet;
            2. Small business and food accelerator – chef training;
            3. Integration of new food formulation, storage, and presentation technologies; and
            4. Creative arts and performance venue;

5. New companies to commercialize the above.

iii. Place-based destination restaurant to enhance tourism – linking Panamanian products to exclusive and unique food experiences – possible El Bulli, or Alinea models; and

iv. Connect this to small-business entrepreneurship training programs similar to the aforementioned "Idea-to-Product".

b. Health + Technology:
   i. Connect natural products with health and wellness experiences;
   ii. Develop unique spa and beauty products;
   iii. Link to service model with product sales; and
   iv. Embed these services and products systematically with tourism.

c. Cultural and linguistic experiences:
   i. Provide curated experiences for visitors to experience Indigenous people groups;
   ii. Learn about natural assets and conservation;
   iii. Visit world class beaches and natural environments; and
   iv. Link these experiences to tourism and other food and health hubs.

d. Change policy to engage ship crews, pilots, staff, etc. to come into Panama to spend tourism dollars:
   i. Design a place-based approach linking transit from Ports, Canal and Airport to hubs for ease of engagement and enhanced "stay time" in country; and
   ii. Create "easy button" approaches for locality of engagement, incubator spillover to new brick and mortar business sites and links to natural tourism experiences.

5. Implementing a natural and unbroken link of innovation resources:
   a. Encourage collaboration between all actors in the region to specific service groups to lower competition, e.g., students, small business, entrepreneurs, intrapreneurs, accelerator phase, incubator phase, etc.;
   b. Connect Ciudad del Saber with incubator hubs to support supply chain/logistics and other vertical clusters;
   c. Create tax and banking policies to incentivize angel and VC capital funds to be formed – with government backing dollar-in losses;
   d. Eliminate barriers to program access and encourage innovators from around Panama to engage with hubs and develop innovations for small business and scalable startups; and
   e. Create policy to incentivize company collaboration in open innovation programs with innovation resources.
6. Engage Austin Texas 6M's (makers, management, members, mentors, money, and market) through regional tethering:
   a. Engage The University of Texas at Austin in internship programs with Panamanian startups to draw talent in diverse disciplines including engineering, data science, computer science, and business;
   b. Create market and money connections by tethering qualified Panamanian startups to the Austin ecosystem via the Global Innovation Lab; and
   c. Train entrepreneurs to ready themselves for international market and funder engagement by participating in SXSW immersive training activities.

INTEGRATION PLAN FOR PHASE II WITH TEXAS GLOBAL

Our assessment report offers recommendations concerning prioritized technology sectors for development to enhance Panama's competitiveness on a global scale. We interviewed strategic partners and influencers and linked our recommendations to defined strategies that engage technologies, startup support groups, talent from the U.S. and other sources to enhance the development of the Panamanian entrepreneurial ecosystem. The central role of CDS in the entrepreneurial ecosystem is supported by this study and we are confident that engaging more with anchor companies, universities, and talent pipelines will enhance its impact and influence. Given these insights, Texas Global will provide targeted training for Panamanian startups regarding value proposition pivoting for international markets. This experiential training program benefits from study of successful startups in Korea, Portugal, and the U.S. (student-led and mature entrepreneurs) who commercialized products in new geographies or markets. Entrepreneurs will build value propositions from market engagement with local markets and gain skills to pivot their strategy to meet new market exigencies. Further, incubator management training entitled, "Incubator's Role in Creating Future Communities" will be provided to CDS and other startup support groups who wish to attend. This program was developed and delivered to top incubators in the International Business Innovation Association (INBIA) and adapted for other groups. We look forward to delivering the trainings during Texas Global's visit to Panama in June 2022.

Phase II of the program will call on greater collaboration between the Global Innovation Lab and CDS to transfer incubation management methodologies and select high-potential Panamanian entrepreneurs to engage in Innovation Readiness® and international commercialization readiness. Finally, members of the CDS team will be hosted in Austin to experience a mature entrepreneurial ecosystem and identify strategies to bring back to Panama for enhanced impact.

"KICK-OFF" MEETINGS

PROGRAMMATIC KICK OFF MEETING

The asset mapping and interview strategy were greatly influenced by our virtual "kick-off" meeting with key stakeholders, held on February 3, 2022:

- Mr. Raúl Adames, Director of Legal, Ciudad del Saber;
- Mr. Richard Amato, Director for Global Programs and Innovation, Texas Global;
- Mr. Jorge Arosemena, Executive Director, Ciudad del Saber;
- Mr. Alejandro Carbonell, Director of Innovation, Ciudad del Saber;
- Ms. Cristina Collazos, Manager for Startup Programs, Ciudad del Saber;
- Ms. Carla Donalicio, Innovation Projects Specialist, Ciudad del Saber;
- Dr. Sonia Feigenbaum, Senior Vice Provost for Global Engagement and Chief International Officer;
- Ms. Larú Linares, Manager of Female and Social Entrepreneurship;
- Dr. Eduardo Ortega-Barría, Director, SENACYT;
- Dr. Gregory P. Pogue, Deputy Executive Director, IC^2 Institute;
- Vice Minister for Foreign Trade Juan Carlos Sosa, República de Panamá;
- Mr. Alberto De Ycaza, Director of Business Innovation, SENACYT.

During this meeting, the "setting" of the project was provided by Vice Minister Sosa as well as key organizations. The goal for Panama to become a key "hub of hubs" in the Latin America Caribbean (LAC) region was presented. Geographic location and strategic actions in the past decade could position Panama to be the nexus for land, air, water, finance, wireless and talent connectivity for the region. Key strategies for interviews and lists of interviewees were provided during and after the meeting. Further, we agreed upon a qualitative assessment of the entrepreneurial ecosystem in Panama. With this approach strengths – in capacity and organization—and gaps or challenges—would be, characterized and specific recommendations for next steps.

Several areas were identified as potential "clusters" (see below) for consideration including supply chain and logistical technologies to accelerate modernization of the Canal and transport system in the country, general technology was identified as a priority since most regional startup activity is focused here. Biomedical science emerged from the pandemic as a possible area of focus. The need for manufacturing of physical materials and machines for healthcare linked to drug production and provision in LAC was viewed as an opportunity. Finally, agricultural outputs linked to value-add products was viewed as a significant area for export potential. These are but potential areas for focus and each will be reviewed in this report. Based on the strong support from the Central Panamanian government, SENACYT, and Ciudad del Saber staff, the study commenced.

SENACYT LEADERSHIP VISIT TO UT AUSTIN

The entrepreneurial ecosystem study was a topic for a highly interactive meeting on March 9th at Texas Global during the visit of Dr. Eduardo Ortega-Barría and Omaira Michelle Rodríguez frpm SENACYT to The University of Texas at Austin.

The March 9th meeting focused on the question, "Why is UT the right partner for Panama?" Panama has deep relationships with Georgia Tech, Florida State, and other U.S. universities. How can UT help the country build an innovation ecosystem? Based on this query, the meeting focused on several experiences and outcomes from the work of Texas Global and the IC^2 Institute to build innovation ecosystems in Austin and more than 44 countries around the world. The white board discussion included these experiences:

1. A brief history of Austin's growth as a tech hub;
2. The Technopolis model (early version of the triple helix that UT originated – see below) and its working model to make the Austin Technology Incubator (ATI);
3. Developing nascent entrepreneurial ecosystems where top universities and available private funding groups are not available:
    a. Northwest Arkansas – supply chain and logistics hub;
    b. Northern Sweden – clean manufacturing hub;
    c. Aichi Prefecture Japan – university, government, and company collaboration needs;
    d. Rockport/Fulton, Texas – arts and tourism ecosystem;
    e. Cuenca Ecuador – public private partnership innovation;
4. Examples of the $260M in regional investments in recommended projects and programs by the regions highlighted.

The meeting was highly interactive, and discussion oriented with our SENACTY partners. Enthusiasm was expressed about UT's work in Austin as well as regions analogous with Panama's situation. The 5D diagnostic (see below) and human-centered approach to economic development appeared to fit well with the needs of Panama. SENACYT leadership provided introductions to innovators they have funded to as well as introductions to key ecosystem influencers to "jump start" our primary research efforts.

SETTING THE STAGE

THE UNIVERISTY OF TEXAS APPROACH

The Global Innovation Lab (GIL) at Texas Global was founded over 20 years originating as the Global Commercialization Group (GCG) at the IC² Institute in 2000. To set the stage and provide better context behind the team preparing the report, it is important to understand the history and influence of the IC² Institute at The University of Texas at Austin. The IC² Institute was established in 1977 to study and test the impact of innovation, creativity, and capital on the advancement of economic opportunities. At that time in the U.S., innovation was viewed as only happening in Bell Labs or possibly Silicon Valley; creativity was reserved for the fine arts; and capital was only an organized way of investing in new business. The Institute was born of the vision that scientific innovation and resulting technology could be the basis for new enterprise building, regional economic growth, and shared prosperity. Studies first focused on communities like Austin, TX which benefited from access to research universities. The institute's groundbreaking research defined strategies for the diffusion of science and technology innovations into economies to create sustainable innovation ecosystems. Serving as catalyst, convener, connector, and cataloger, the institute defined the Austin Model for community economic growth. Key outcomes include the first planned innovation cluster (1983), first business plan competition (Moot Corp 1984), first model for an entrepreneurial ecosystem (the Technopolis, 1988), first networked university incubator (Austin Technology Incubator, 1989), first technology to market degree (Masters of Science in Technology Commercialization) and many other "firsts." When you are in Austin, you will witness the impact of this work to this day - a community of high quality of life blending innovative large companies, active startup community and strong talent roster to support enterprise growth. This model has been disseminated across the United States and to 43 countries, producing >$4.8 billion in community economic development mediated through entrepreneurially driven economic activity.

From these studies since 1977, we have come to agree with the definition of economic development articulated by the California Association for Local Economic Development:

> *Economic development is the creation of wealth from which community benefits are realized. Economic development is more than a jobs program, it is an investment in growing the regional economy and enhancing the prosperity, inclusivity, and quality of life for all residents*[1].

Thus, economic success moves beyond measurement of GDP, unicorns, billionaires, and other public relations approaches, but seeks to spillover impact to all citizens and employs other measurements – those for human well-being mentally, physically, economically, and culturally. It is easy to fall into the temptation of being like "_____" fill in the blank, without realizing the systematic inequality and challenges the aspirational region may have. We encourage regions to build from their shared values and people outwardly to innovation and industry. In this way, fewer are left behind by change.

ESTABLISHING A COMMON LANGUAGE

Several words will be commonly used in this report, and we must be clear at the beginning what the writers of the report mean and through what lens they will view data, interview responses, and make recommendations. Although we could derive meanings from a thorough review of the academic literature, we will focus on generally accepted vernacular meanings of these words and associated concepts.

[1] https://caled.org/economic-development-basics/

Creativity is where things begin – how do we see our world and what is happening within it. Creativity extends to seeing things differently, both problems and solutions, and developing an idea or its representation (organizing our thoughts) into a new perspective[2]. When one takes an idea and acts upon it, transforming a concept, process, or function into a useful instantiation one produces an **invention**. This invention can be protected by various intellectual property provisions allowable in countries, including patents, copyrights, or trademarks, to name a few. These protections provide a limited monopoly for the use and commercialization of the invention. Moving an invention into a product or service that can be tested for commercial feasibility is **innovation**. This can result in a totally new offering, be an extension to an existing offering, or be delivered through a new business model among many options[3]. The **entrepreneur** sees opportunity in a marketplace for innovation and starts a new business entity to realize the innovation's potential economically, socially, and/or civically. One may define many different types of entrepreneurs based on the type of innovation they engage and impact they seek[4]. But if you look at the businesses they create, they generally fall into two categories – small and scalable businesses.

Small businesses can be very creative, satisfying, and successful – as measured by personal satisfaction, employee number, revenue, physical spaces occupied. However, these businesses are purposed to stay under the control of the owner or their designate – not planning to expand, sell off, or "exit" the business. Funding that is needed and sought is generally through non-dilutive means (with regards to ownership position). Ultimately, a small business is a tool to deliver products and services as the measurable value. A **scalable business** has a different goal; it is started to occupy a particular market space and ultimately compete to own this space on a broader "scale" than a small business. It does this by embracing business models that can stimulate exponential growth, requiring equity-based financing, and pursuing realization of a liquidity event through sale or public offering whereby shares can be converted to realized financial value. Thus, scalable startups are financial vehicles for realizing value. Creating areas of innovation expertise, talent capability and market outlets such that a geographic region has economic advantage is often expressed in the concept of **clustering**[5]. Clusters are often particular economic or technology verticals where a region has unfair advantage and can coalesce the innovation, talent, capital, and market access needed for growing scalable startups and expanding existing companies. Careful asset mapping considering external trends and economic context can help identify areas of advantage based on data – not solely on aspiration or opinion.

THE CULTURE OF ENTREPRENEURIAL ECONOMIES

So, how does a region grow new businesses and technology clusters? Entrepreneurial ecosystems are a composite of regional culture and actors – institutional and individual – that support the aspirations, growth and exit of entrepreneurial enterprises[6]. Trust and generosity are at the core of the ecosystem – one invests time, talent, or treasure in another with the expectation that this investment will stimulate further, subsequent investments in others. This "pay it forward" mentality and "being patient for repayment" creates a virtuous cycle of investment and re-investment. Thus, a shared culture of sharing must be grown and maintained for success of this ecosystem. In our work, we have noted that the "human" side of economic development is critical and is often ignored by researchers and practitioners

[2] https://hbr.org/2002/08/the-discipline-of-innovation
[3] https://ideadrop.co/innovation-management/different-types-of-innovation/
[4] https://lonelyentrepreneur.com/types-of-entrepreneurs/
[5] https://www.brookings.edu/wp-content/uploads/2016/06/0921_clusters_muro_katz.pdf and references therein.
[6] https://www.kauffman.org/ecosystem-playbook-draft-3/ecosystems/

in lieu of focus on traditional economic strategy, often expressed in planning and action, and pursuing whatever innovation cluster de jour is trending. But human agreement, support, and sharing on the positive side, or distrust, competitiveness, or rejection on the negative, will trump policy and practice in any community. When we refer to "**communities**", we mean human interaction spaces for ecosystem building. These can be places, geographically defined or not, within a city, or encompass a city or an entire country. Cohesion and agreement in identity, values and goals are key for community definition.

We have found that deep understanding of **community culture** defines opportunities and constraints for communities as they plan. Further, culture influences collective **community values and resident mindset** regarding growth, change and inclusivity – and the felt nature of the values and mindset is recognized by young talent as either attractive or, well, not. Finally, culture, values and mindset define dominant **community climate** defining collaboration patterns for people and organizations within it. These patterns are key for inclusive, sustainable prosperity for a region's economy. Our observations do not de-emphasize the analysis of traditional drivers of economic growth. We typically add analysis of "human" factors since they can:

1. Restrict opportunities by human constraints limiting cooperation and collaboration; and
2. Advance opportunities during difficult situations when human agreement and action are aligned.

In other words, you can have all the economic assets and advantage in the world, quite literally, and fail to become an entrepreneurial ecosystem due to human issues. This understanding produces in an **inside-out economic development strategy**, where communities must understand and grapple with its own culture, values, mindset and collaboration, and drive change through transformation of human interaction patterns toward economic goals. This change is often measured over time by innovation index, economic growth, inclusive opportunity, and resiliency. Human-centric approaches offer important support to strategies offered by traditional economic development experts.

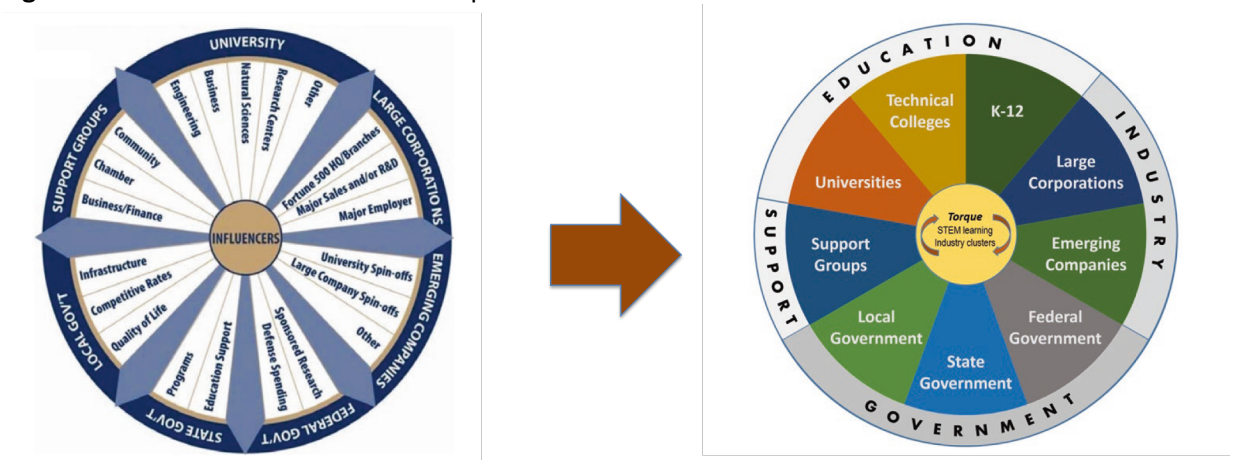
INSTITUTIONS AND INDIVIDUALS

Institutions must collaborate through mutual incentive to create and maintain an entrepreneurial ecosystem. The Technopolis model, as well as derivative Triple and Quadruple Helix models, argue that government (local, state and national), business (startups to market leaders), education (K-20) and community (support organizations for talent, time, and capital) must engage with each other to promote and sustain entrepreneurial culture and economic growth. These collaborations are mediated by influencers – key individuals that link goals and actions between institutions. Promoting the role of influencer is key to moving from a network defined on paper or in a PowerPoint slide, into a functional, growing, and synergistic set of actors with notable impact. From this early model in 1988, we have learned the key role of STEM education and the extension of the educational sector from "universities" to technological/community colleges and K-12 education. This transition is shown in Figure 1.

Finally, the human ecosystem that links innovation with **talent** is critical. We view people more than the workforce skills they may provide and advance their value to impact creativity, invention, innovation and ultimately entrepreneurship as expressed inside an established company or independent of one. Talent is the most precious tool in the entrepreneurial ecosystem – one hard to obtain and hard to maintain. Competition is always seeking to draw the best into new ecosystems. Often the tangible assets of places, capabilities, balance sheets are the emphasis in ecosystem building and cluster creation. Ultimately, we advocate that the intangible assets of talent and invention, which are intricately connected, are the most fungible and valuable of regional assets. This focuses the concept of human-

centric economic development. Human skills, collaboration, growth, and synergy is key for regional success. Further, the humans in a region must agree with policy and programmatic interventions. Often these are paid by tax monies. The lack of support by the community can overcome positive programs and lead to their failure. Further, the values and sentiment of community must be engaged to create growth mindset, overcome cultural barriers, and produce a risk-tolerant and innovative climate that fosters entrepreneurship.

Figure 1. The maturation of the Technopolis model from 1988 to 2020.



The Technopolis: Austin Model: 1988
Smilor et al., 1989. J. Bus. Vent. 4:49-67

The STEM Technopolis with Educational Torque: 2020
Kidwell et al., STEM and the Technopolis. Springer Nature. https://doi.org/10.1007/978-3-030-39851-4

These human intangible assets must be mapped and engaged for success. We refer to these assets as the 6-M's:

- ***Makers:*** the innovators that seed the launch of new innovative and transformative businesses;
- ***Members:*** the talent that fuels product/service realization and company growth;
- ***Management:*** experienced and proven entrepreneurial leadership whose connections and strategy drive company success;
- ***Mentors:*** peer and expert advice and support networks that speed learnings, increase proximity to funders and market, and create an open and inclusive ecosystem;
- ***Market:*** access to customers, sales channels, and scalable business models; and
- ***Money:*** access to funders who are fitted to the domain expertise and growth model of companies.

One can see the synergy between institutional contributions to the ecosystem and that of the humans – institutions must train, link, and reward collaborative engagement of individuals. Growing human assets organically is a very slow process. However, there is another approach: growth can accelerate through collaboration and sharing between regions**.** Key assets are accessed through **relational tethering** regions or communities that have shown domain or technical leadership. What should be tethered? Sometimes it is physical spaces, technical competencies, or equipment. However, in our experience we have noted that intangible assets – the 6 M's – are often the most critical to accelerating regional ecosystem growth. Such tethering activities offer multiple areas of development to be approached simultaneously, at lower costs and over much shorter time periods. Regional tethering with Silicon Valley played a key role in accelerating the growth of Austin, TX in the form of Makers, Management, Mentors and Money.

Austin in turn has acted as a tethering site for Northwest Arkansas, Monterrey Mexico, and other communities.

SUMMARY

Thus, an ecosystem must promote, link, grow, and reward creativity, invention, innovation through entrepreneurial expression and activity. The success of entrepreneurs is largely dependent on the "setting" or "context" they grow in – the ecosystem around them. Engaging institutions through influencers to move from verbal commitments to measurable, costly collaboration is key if the human assets, the 6 M's, can be grown sufficiently to support entrepreneurial activity in a region. A key accelerant is tethering with established talent and asset rich regions to engage assets in a new ecosystem.

DIAGNOSTIC FRAMEWORK

Through our work in the Aichi Prefecture of Japan, Northwest Arkansas, Cuenca Ecuador, and communities around Texas, we have found a useful framework – the 5D's (Distance, Diversity, Dilution, Demand, Disengagement) – that helps us understand gaps for communities to build entrepreneurial ecosystems, while providing insight into fitted strategies to overcome each. One will note that the 5D's focus on institutional and human communication and collaboration behaviors. We find that in communities, understanding humans and the inter-working of humans together are key to understanding and solving community gaps. The 5Ds are:

- ***Distance:*** Reflects geographic, physical, and relational factors that restrict collaboration—such as the physical distance between communities, lack of engagement between groups of humans in a community;
- ***Diversity:*** Points to inequities in engagement or representation of the population in perspective, leadership, and participation;
- ***Dilution:*** Describes both the lack of focus regarding specific goals as well as inadequacies of human, physical and innovation assets to support the attainment of stated community goals;
- ***Demand:*** Contemplates relational dynamics between institutions and individuals where each requires the primacy of resources, attention or support and do not prioritize initiative to build or grow fair, collaborative relationships; and
- ***Disengagement:*** Expresses the lack of proactive engagement between industry, education, government, and public sector toward common regional goals.

The 5Ds will be used to aggregate insights from interviews and asset mapping to provide diagnosis and recommendations in this report.

ASSET MAPPING

Requests were made and sourced from Panamanian government, university, business, and support groups to provide documents to help our assessment of key country assets related to economic and entrepreneurial competitiveness. We received only a few materials. Thus, asset mapping has been completed using documentation available through public and non-Panamanian government sources detailing key assets to provide a setting for findings derived from our interviews of key stakeholders in

the country. We will provide only a summary of key findings, not a thorough asset map. Key assets reviewed to date include:

1. Panama as a "Hub"
2. Economic
3. Education
4. Natural Resources
5. Tourism
6. New Business Support
7. Entrepreneurship and Startup Opportunities

It will come as no surprise that Panama's chief asset is location – being a common conduit of transit by land, air, and ocean from North to South, and East to West along the American continents as illustrated below.

PANAMA AS A HUB

Panama offers several key assets for becoming a hub for trade in the LAC as illustrated in Figure 2. These include:

- Dollarized currency;
- Stable democratic government;
- Logistical advantages:
  - International airport and hub: Panama Tocumen Airport;
  - Recently enlarged Panama Canal;
  - Physical connectivity through the Americas through roads, rail and physical optic cable; and
  - Second largest free-trade zone in world – largest in LAC;
- Encouragement of foreign in-migration.

Figure 2. Panama's position in international trade[7].

[7] J.Cain & Co.

This growth and position as a trade hub is expected to be expressed in larger, multi-national companies and collaborations. In contrast, Costa Rica has grown in the LAC as a site for smaller business and innovation growth with:

- Strength provided by a well-trained workforce;
- Competent executive class and stable political system;
- Ecotourism; and
- High technology.

Panama has further strengthened its position as an international hub by:

1. Expansion of the Panama Canal to allow passage of vessels with >14,000 TEUs (Twenty Equipment Unit);
2. Improved ocean ports – three on the Atlantic side and two on the Pacific. Indeed, Colón is the largest port in Latin American and Caribbean (LAC) and ~23% of all port cranes in LAC are in Panama;
3. Grown Free Trade Zones along the Atlantic and Pacific oceans with large international partners. In these zones no tax is paid on imports, exports, income, and warehouse storage – with transit times of as short as one hour;
4. Offering an air passenger and cargo center – development of the Tocumen International Airport to offer two terminals, more destination and greater cargo service increases its role as the connection point for LAC. Expanding the Free Trade Zone to the airport will further improve cargo transit value;
5. Highway and rail systems that span Central and South American and link with ports and the Canal; and
6. Fiber and connectivity – physical connectivity for optimal internet access also extends from North to South America through the Panamanian land bridge.

In a globalized economy where corporate and individual customers value speed and predictability above all else, Panama can offer more and better options for international logistics and supply chain management as well as a rapid port of call for all of LAC. What are other factors disrupting shipping and logistics, and how do they fit with Panama's future?

THE "FUTURE" OF SHIPPING[8]:

Lack of capacity in Los Angeles and Long Beach ports have become apparent in 2020-21, with long waiting times, equipment and staff shortages, and delays in container return or re-export. Further, the spillover effect of requiring intermodal rail to move products effectively to Midwest U.S. distribution centers has created further delays. This has affected imports and consumer prices as well as delayed U.S. agricultural exports and revenue.

Coupling lack of capacity of Los Angeles and Long Beach ports with population shifts occurring in the U.S. (moving from West to South and Southwest) position Panama as a more attractive shipping site due to its simultaneous EU-facing ports. Amazon is following this trend with only 8 of its new warehouses planned for the Western U.S., with the remainder in the Gulf Region, Midwest and East Coast. Upgrades

[8] https://hbr.org/2021/03/its-time-to-rethink-your-global-logistics

in the Port of Houston as well as ports in New Jersey, New Orleans, and Virginia offer reach from Yantian via Panama to the U.S. Gulf in 28 days. This competes favorably for the 31 days via the Suez westbound route. Such time advantages will be important as countries build a "China+1" trade strategy to reduce single-source supply chain dependencies. However, note that the advantage is only a few days. Facility and efficiency in transit and transparency in status will play a key role to maintain and grow this advantage.

Finally, many LAC countries have yet to realize export potential of raw and value-added goods. Most LAC nations (including Panama) have severely upside-down trade deficits. Export revenue is seen as a powerful tool to enhance economic prosperity and equality in the region. When one adds the complex long distance and last mile shipping systems present, multiple borders and tariffs, and security concerns – companies are looking for single and simple logistical solutions. Panama offers a strategy to link macro-shipping to domestic ports as well as intra-LAC transport. Key to future leadership in shipping and logistics include:

- Trade and logistical hub:
  - Leverage geographic position
    - Interoceanic canal
    - Large ports in both oceans
  - Grow air and sea logistical hubs
    - Panama Canal
    - Tocumen International Airport
  - Free Trade Zones, including:
    - Colon Free-Trade Zone
  - Encourage and incentivize international companies to use its ports so to them operational costs,
- Focus on stable and sustainable internal growth as a country

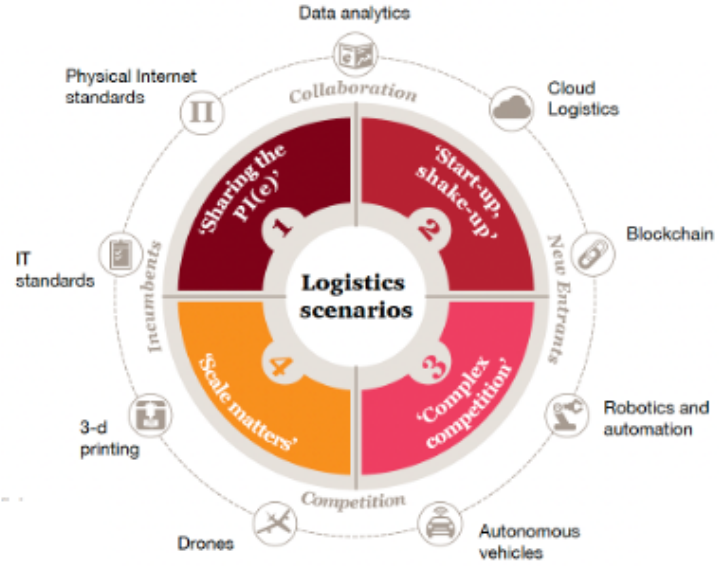
INTEGRATION OF PHYSICAL AND DIGITAL ASSETS

The shift toward Industry 4.0 and its impact on logistics and supply chain merits some review. Key customer requirements demand new approaches, including:

1. "Time" is king;
2. "Lot size as one;"
3. Predictability of time and quality;
4. Increased flexibility in delivery – with reliability;
5. "No pay" or "same-pay" for shipping – agnostic; and
6. Total retail – integrating brick/mortar, online retail and mobile.

In light of these trends, physical and technology assets, such as Internet of Things (IOT), must be allocated to create new strategies to improved competitive outcomes as summarized in PWC's Future of Logistics Report. Figure 3 offers an integrated view of the dimensions of technology integration.

Figure 3. Technology integration in the future of supply chain and logistics[9].



Who will lead the new shipping and logistics hub strategy? Regional requirements include broad "digital fitness" as evidenced by[10]:

1. Integration of data analytics across supply chain partners;
2. AI tools to deliver dynamic routing;
3. Virtual freight forwarding;
4. Improved traceability and predictability;
5. Smart warehousing;
6. Digital marketing; and
7. Branded integration with service.

This demands that companies and workforce be integrated in digital culture with fair practice and sharing of activities between humans, robotics, and stationary technologies. Regional considerations demand access to talent and technology to manage data, robotics and IoT as these approaches offer enhanced profitability of supply chain and logistical enterprises. Thus, true internet and technology assets must be linked with the physical "internet" of places and people.

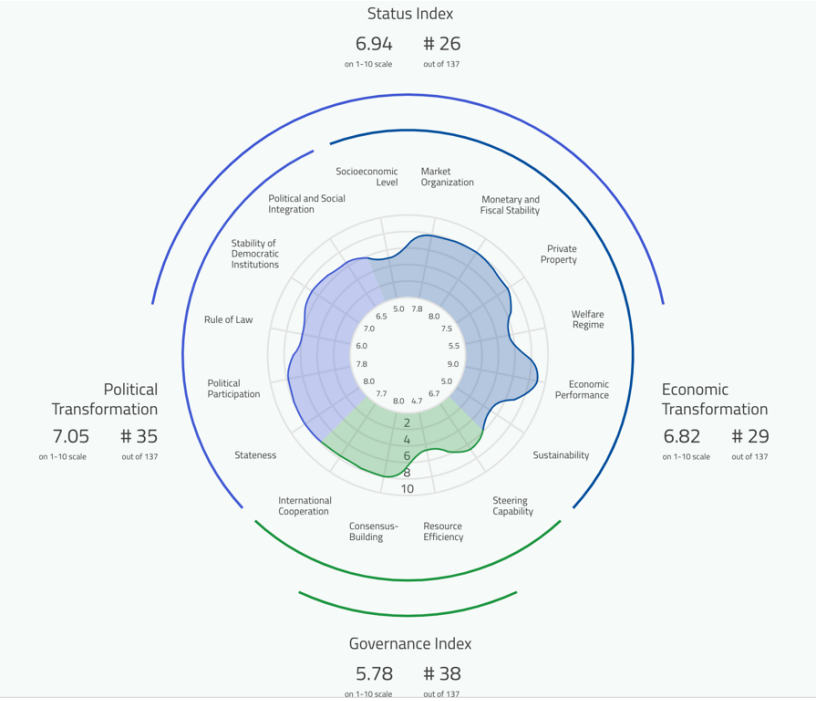
[9] https://www.pwc.com/gx/en/transportation-logistics/pdf/the-future-of-the-logistics-industry.pdf
[10] Ibid.

ECONOMIC SUMMARY

Before the global pandemic[11], Panama showed one of the most robust economic performances throughout LAC with 4.7% GDP growth in 2019 and improvement in global investment grades. But this growth was not experienced by all. Figure 4 shows a force map with comparative status between Panama and LAC country averages. The national poverty rate was 12.9% and individuals in rural areas show a six-fold higher poverty rate than present in urban areas. According to sources, 27% of the rural population lives in extreme poverty in comparison to 4% in urban areas[12]. In many areas wealth is lacking and access to quality healthcare and education can be challenging. The wealth disparity is among the starkest in the LAC with 54.4% of the wealth in Panama being held by 20% of the population[13]. Linking innovation with purposeful goal of spillover for shared prosperity could have a large impact. The force map below shows Panama's ratings among LAC countries across several key parameters.

This analysis points toward a country of political stability, strong economic performance, and international relationships, but uneven performance in terms of equity, opportunity, and business climate. Despite strong GDP growth since 2006, youth unemployment has been on a steep rise since 2013 reaching almost 11% in 2017 and 13% in 2019 pre-pandemic. This data points to disconnects between company performance and citizen engagement in workforce and economic benefit spillover as noted previously for the urban / rural divide.

Figure 4. Force map showing status indexed to LAC countries for Panama[14].



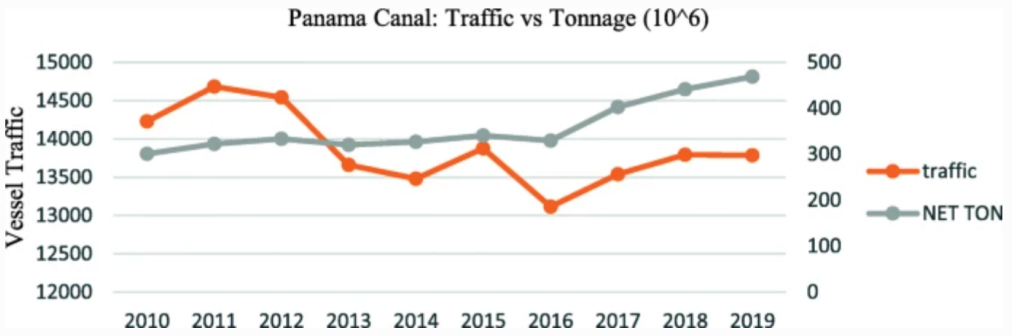
[11] https://www.worldbank.org/en/country/panama/overview#1
[12] https://borgenproject.org/poverty-in-panama/
[13] https://www.statista.com/statistics/1075285/panama-income-inequality/#:~:text=Panama%20is%20one%20of%20the,53.6%20percent%20a%20year%20earlier.
[14] https://bti-project.org/en/reports/country-report/PAN

Panama shows a significant trade deficit for products, but a trade surplus for services due to shipping and logistical activities[15] as summarized in Figure 5.

Figure 5. Panama export and import summary 2019.

This trade deficit is common across the LAC with exports stagnating largely since 1970[16]. Reviewing the activity of the Canal, one sees the importance of growth of tonnage and the key role the Canal plays in LAC import and export capacity (Figure 6)[17]. These and other data point toward the underperformance of the LAC in export trade, but the key opportunity for Panama to play a key revenue and trade facilitator through the Canal. This strategic positioning could assist with LAC trade expansion to U.S., EU, and China in the future.

Figure 6. Panama Canal: measuring traffic vs. tonnage 2010-2019.



Panama Canal Traffic and Traffic vs. Net Tonnage comparison for period 2010–2018. Source: Panama Canal Authority (2019)

Trade profiles for export and imports of Panama are shown in the Figures 7 and 8 below[18]. Primary export partners are regional – Guatemala, Ecuador, Costa Rica with the U.S., and China making up significant partnerships (Figure 7). Many are raw products, not value-add, in the form of coal-tar, copper, gold, bananas and other products. Imports are primarily finished goods, machinery, technology,

[15] https://wits.worldbank.org/CountryProfile/en/PAN
https://oec.world/en/profile/country/pan
[16] https://www.oecd-ilibrary.org/docserver/leo-2018-7-en.pdf?expires=1645468596&id=id&accname=guest&checksum=43F8A94E0CC3E4817FD7726ADDB67403
[17] https://jshippingandtrade.springeropen.com/articles/10.1186/s41072-021-00091-5
[18] https://oec.world/en/profile/country/pan

and other high-value products from primarily China, U.S., and Japan (Figure 8). Regional collaborations also matter with Ecuador, Colombia, Brazil among other countries.

Figure 7. Panama product exports and export recipients.

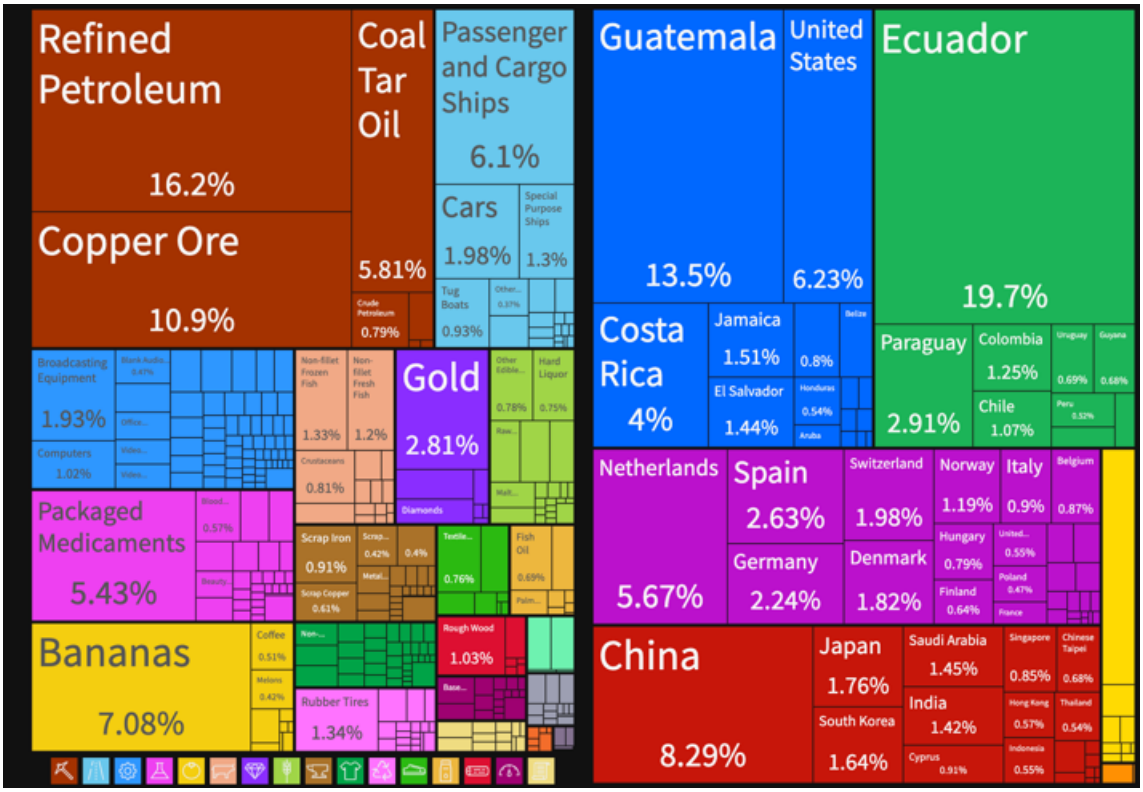
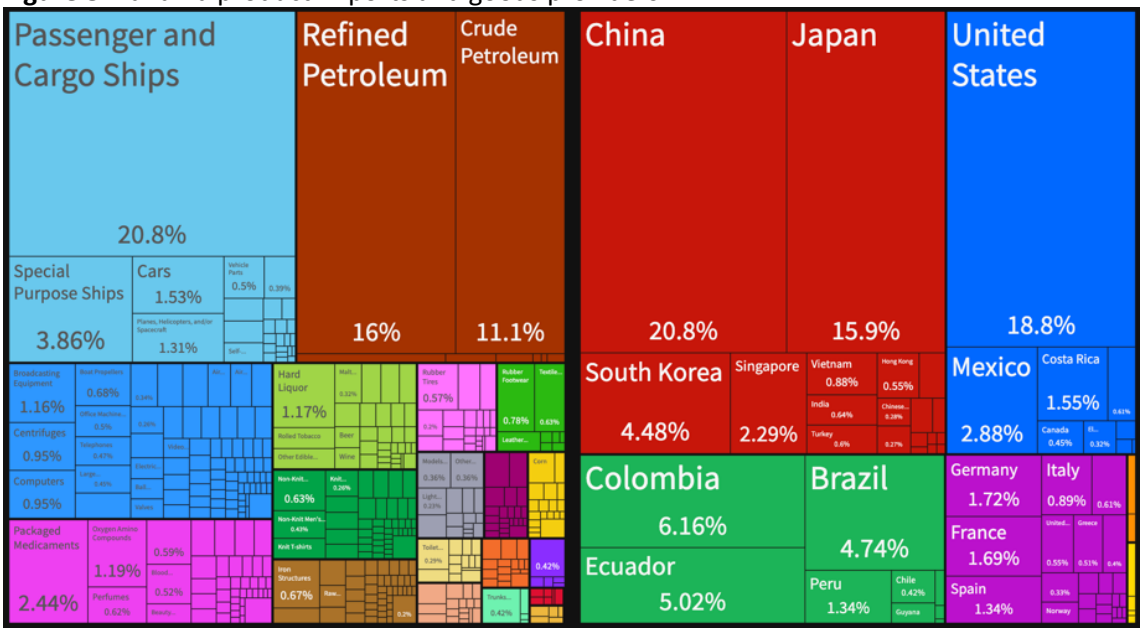


Figure 8. Panama product imports and goods providers.



SUMMARY OF COLLECTED DATA

Strong economic factors noted between 2008 and 2015[19] include:

- The Canal to Panama:
  - Transferred in 2000 for national control;
  - Leveraged into logistics and trade hub; and
  - Growth as financial center.
- Public investment:
  - Expansion of the Canal;
  - Construction of Metro in Panama City; and
  - Attract more FDI.
- Panama's real growth since 2001 has been more than double the average for Latin America and the Caribbean (LAC).
- Positioned to become one of the most competitive economies in Central America, comparable with Chile.

Key trade partnerships include:

- Second largest free-trade zone in the world
- Post-Brexit deal with UK
  - Keep two-way trading rates at $90B (2018 level);
  - Expansion in post-pandemic need;
- Increasing investment by Chinese firms
  - Free trade agreement;
  - Developing new trade alliances;
- U.S. –Panama Trade Promotion Agreement
  - Removes tariff barriers for U.S. goods;
  - Aligns with deals with Canada and EU; and
  - Agreement on fair trade, fair labor, and IP provisions.

Essential asset provided by the Panama Canal. Summary of its value includes:

- 90% of world trade uses sea routes
- 5% of sea trade uses Canal
- U.S. and China largest users
- Enlargement allows vessels of 14,000 containers to transit – triple previous volume
- 2018: 400M tons of product
- Panama Canal Authority
  - >$3B in revenue
  - >$1.6B to National Treasury
- Return $1.8B to economy

Economic challenges noted between 2008-2015[20]:

- Infrastructure
  - Urban and rural
  - Water and sanitation
- Energy

[19] https://documents1.worldbank.org/curated/en/180611468100727814/pdf/947060SCD0P1510IC0disclosed03030150.pdf
[20] https://documents1.worldbank.org/curated/en/180611468100727814/pdf/947060SCD0P1510IC0disclosed03030150.pdf

    - High demand and insufficient access or production to keep up with economic expansion;
    - Need to balance traditional with new green technologies for climate preservation;
- Education and skills
    - Lack of coverage and quality across secondary and tertiary education to match technological and sophistication changes;
    - Imbalanced supply of high skill and lower skilled workforce;
- Public sector institutions
    - Need for more transparency, efficiency, and quality regulatory framework;
    - Use of incentive-based funding strategies.

The newly announced relaunch of the Panama Canal Container Port through partnership between Mediterranean Shipping Company (MSC) and Notarc Management Group is expected to provide a new logistics and supply support facility. The 8-year delay has negatively impacted trade capacity and competitiveness of goods movement. It is hoped that a modern data-driven strategy will be integrated into the physical logistical port to upgrade transparency and efficiency of goods movement. Further, the 'Vision 2030 Panama' program encourages further foreign investment and development of a smart city for future generations leveraging:

- Macroeconomic stability created by the Panama Canal and
- Other infrastructure projects announced.

The key will be how to create impact outside of macro-economic events – e.g., mass shipping and large multi-national companies. The Canal and other major transportation hubs have not shown significant spillover to encourage small and scalable business starts. Further, employment at major companies has not solved youth unemployment or urban/rural income and opportunity disparities.

PANDEMIC IMPACT

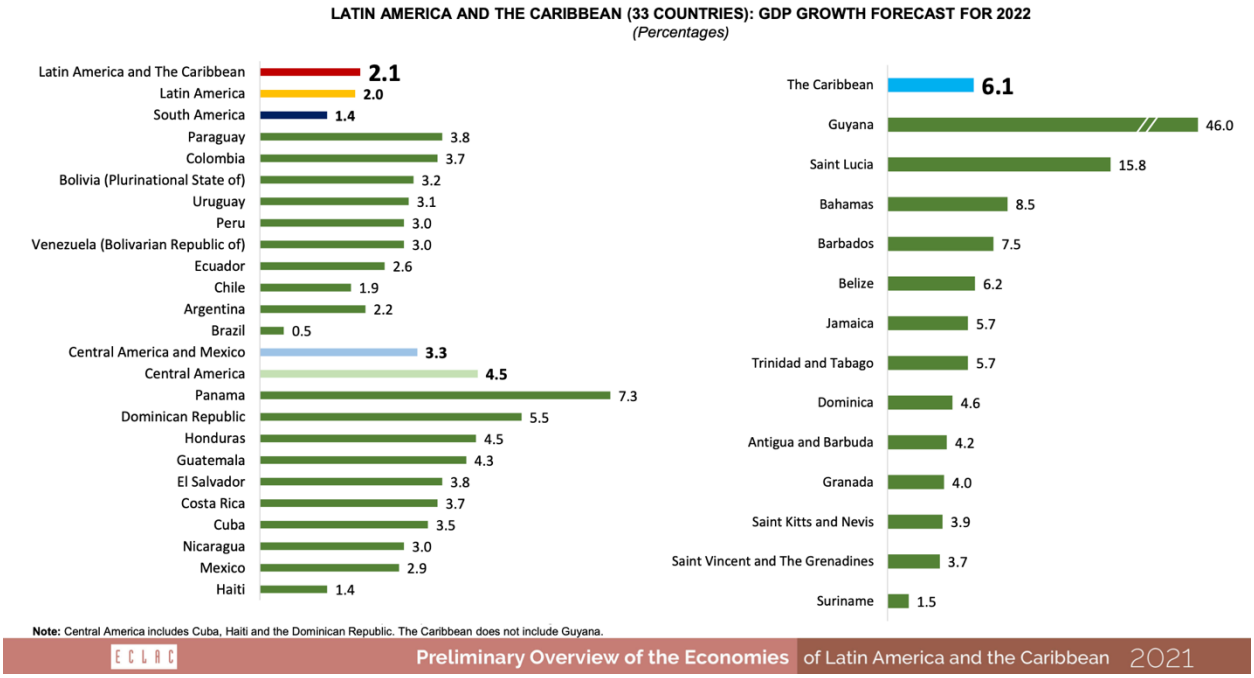
In 2020 the pandemic introduced a significant social, economic, and medical shock to Panama. As with the rest of the world, the pandemic impacted Panama dramatically:

- Contractions observed:
    - Decline of 17.9% in GDP in 2020
    - Revenues decreased by 21.2%
    - FDI decreased from 5.5 to 3.2% of GDP in 2020
    - Decline of 18% in unemployment
    - Increase of poverty rate by 2% to 14.9%
        - Mitigated by *Panama Solidario* program from potential 20% poverty rate projected
- Expansions observed:
    - Debt: from 46.4% GDP in 2019 to 69.8% GDP in 2020

Nonetheless, in 2021, Panama has shown robust growth with real GDP growth of ~9% and reduction of budget deficit to ~7% of GDP was expected. Continued growth as a shipping and logistical hub offers Panama a strong position for future economic growth. However, it is predicted that GDP growth will

slow to 1/3 this rate in 2022 – or for Panama – 7.3% is predicted due to trade volume changes, commodity pricing and slower export update as shown in Figure 9[21].

Figure 9. GDP Growth rate Forecast for 2022.



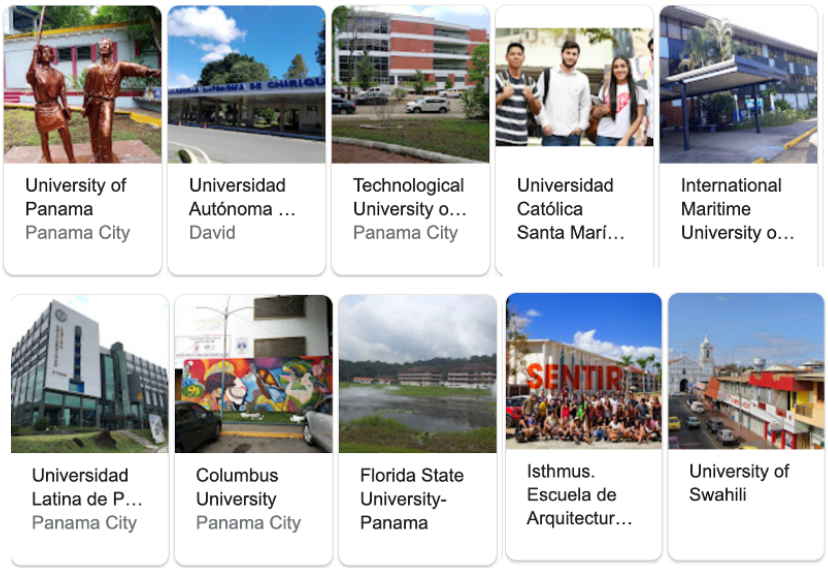
[21] https://www.cepal.org/sites/default/files/presentation/files/220112_1250_220111_ppt_bp_2021_abi_version_final-rev4_ingles.pdf

EDUCATION

Panama has extended education to its population in impressive fashion in the past decades, with education available to all and illiteracy rates decreasing to ~5%. In 2019, the Ministry of Education reported >817,000 students in primary and secondary schools with >95% receiving preschool education. The Panama Bilingual Program produced >260,000 bilingual workers by 2020. From various interviews completed to date, the strength of the Panamanian education system appears to be basic education and work-readiness. Advanced classes and options to enhance production of strong thinking skills, advanced proficiencies or leaders with technological readiness was questioned. Common requests are to move educational system from "rote" or memorization outcomes to critical thinking. Toward this is the introduction of the law to offer entrepreneurship courses in K-12 education. It is expected that this will take several years to implement, but this represents a key start.

There are ~22 universities in Panama – all but one is in Panama City (Figure 10). The Universidad de Panamá has a rich heritage and strong reputation as the oldest university in the country. Universidad Tecnológica de Panamá is also well known for engineering and invention in the country. The rankings of these universities start at ~163 in Latin America for the Universidad de Panamá and ~296 for Universidad Tecnológica de Panamá. Other universities follow around the 500 positions in the region. As with K-12, the reputation of university education is traditional, lacking in innovation and does not prepare talent for advanced jobs or new venture engagement.

Figure 10. Examples of leading universities in Panama.



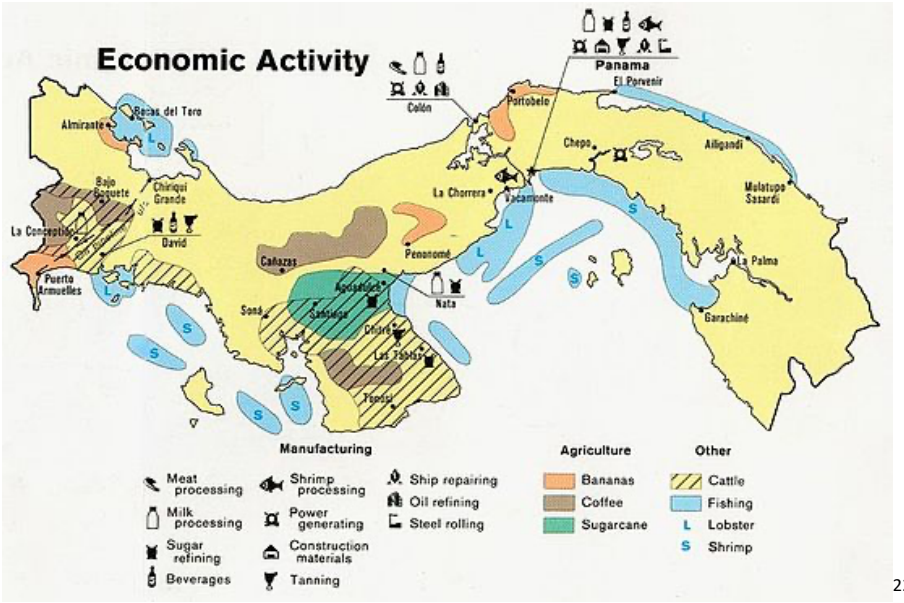
NATURAL RESOURCES

As noted previously, proximity and connectivity are key advantages for Panama. It is the connector for North-South, East-West transportation in the Americas. Roughly half of Panamanians live in Panama City. Its reputation as the New York of Central America reflects its architecture, proximity to water and highly developed financial district. The other half of Panamanians live in small cities and rural communities. The physical relationship between geography and economic activity is illustrated in Figure 11 below.

There are seven indigenous peoples of Panama: the Ngäbe, the Buglé, the Guna, the Emberá, the Wounaan, the Bri bri, and the Naso Tjërdi. Indigenious people number ~418,000 or 12% of the total Panamanian population in 2010. Territory, political and economic engagement, and independence continue to be challenges.

The coastal plains and rolling hills of coastal regions give way to steep, rugged mountains and upland plains. The key natural resources are copper, mahogany forests, agricultural products, and hydropower. For example, Panama is known for its Arabica geisha coffee beans. These are among the most sought-after and expensive coffee bean varietals in the world. Linking bean production to high-quality processed beans for export and consumption leads to an important transition to a value-add economy. Although Panama is known for its high-quality coffee and relatively high return to its farmers, it only ranks #32 in the world for coffee export – less than 1% of the world's coffee. Key threats to Panamanian natural resources include deforestation, soil erosion, and chemical runoff from agriculture and mining operations.

Figure 11. Geographic relationship of Panamanian economic activities – illustrative, although dated.



22

[22] https://en.wikipedia.org/wiki/Economy_of_Panama

TOURISM

In 2019, the number of arrivals for Panama was 2.49 million. That number had increased from 600,000 in 2000 to 2.49 million in 2019 growing at an average annual rate of 8.02%. This led to a ranking of 86th in the world regarding tourism. The contribution to the economy was $7B in 2019. The importance of the Panama Tocumen Airport cannot be overemphasized. It is the hub for Copa Airlines and its partners, including United Airlines. Significant investments in the Chiriquí Province have been made to attract regional tourism – principally Costa Rican and LAC visitors.

In 2015, the Panamanian government launched a strategy to develop sustainable ecotourism. The program is known as the Iniciativa Turismo Verde (Green Tourism Initiative). It was launched via web and smartphone App: Ecotur Panamá. This links various activities to visitors for information, booking and travel, including:

- Swimming, rock climbing, kayaking, whitewater rafting and snorkeling;
- Guided hikes into the forests and mountains and zip line;
- Jungle boat rides at Gatun Lake; and
- Visits to an indigenous tribal settlement providing a cultural learning experience, The Emberas, along the upper reaches of the Chagres River are open to sharing culture.

NEW BUSINESS SUPPORT

Panama established the 'Friendly Nations' visa scheme to facilitate residency requirements for immigrants from 50+ countries making it easy to establish a new firm or work at an existing firm in country. The requirements to start a business in Panama appear well defined and easily maneuverable:

- Registration requires 2-weeks;
- Registration does NOT require you to be in-country;
- Directors, shareholders, and company officers can be of any nationality when registering the business and can live in any country in the world;
- Corporate board meetings need not be held in Panama;
- Straightforward visa process;
- No income tax on foreign profits; and
- Dollarized economy.

There are several business benefits offered to new firms in Panama:

- Grants for small businesses offered through Ampyme;
- Grants of $30-35,000 and up to $250,000 for scalable businesses offered through SENACYT and Ciudad del Saber;
- 'Microbusinesses' that earn up to US$150,000 are exempt from income tax for their first two operations, under Law 72 of 2009; and
- Openness to diverse and women-owned businesses.

Panamanian tax rates are modest, with the corporate tax rate at 25% and the highest personal tax bracket at 27%. These are viewed as relatively favorable for business establishment and growth.

PANAMA STARTUP ECOSYSTEM

When looking at scalable startup establishment and growth, Panama has room for improvement, in the LAC and world. Startupblink provided these data in 2020 for review (Table 1)[23]:

- Brazil:
  - Rated #1 in LAC;
  - Rated #20 globally;
- Other countries in ranking:
  - Rank from 34-80 globally;
  - LAC lags most continents in innovation and scalable entrepreneurship;
- Panama
  - Rated #10 in LAC;
  - Ranked 83rd in world;
  - Increased 4 spots in past few years;
  - Panama City is lead site;
  - Notable startups:
    - Nordlocker,
    - Munily,
    - Cuanto,

[23] https://lp.startupblink.com/report/

- Wisy,
- Others.

Table 1. LAC Startup Ecosystem Rankings – Startupblink 2021.

Rank	Country	Number of Ranked Cities	Global Rank	Rank Change (from 2020)	Total Score 2021
1	Brazil	32	24	−4	**7.326**
2	Chile	4	36	−2	**4.976**
3	Mexico	17	38	+3	**4.800**
4	Argentina	5	39	−1	**4.613**
5	Colombia	4	47	−1	**3.547**
6	Uruguay	1	51	+15	**3.000**
7	Peru	1	62	−6	**1.540**
8	Costa Rica	1	72	new	**0.586**
9	Jamaica	2	79	−3	**0.419**
10	Panama	1	83	+4	**0.355**

When one compares countries ranked ahead of Panama, one sees much opportunity for improvement: #62 Peru; #72 Costa Rica; #75 Pakistan, #81 Ghana, #82 Tunisia, and #86 Ecuador. None of these countries have trade assets comparable with that of Panama although population and economic sizes differ.

A separate ranking done in 2020 by Contxto does not have Panama ranked in the top 10 in the LAC – see Figure 12 below.

Figure 12. Latin America's top 10 tech hub ranking in 2020[24].

[24] https://contxto.com/en/news/top-tech-hubs-latin-america/

Both reports show room for significant growth in startup ecosystem strength, startup numbers, talent support, and other success factors. Reviewing another comparative database and report, the following opportunities and challenges were outlined by the authors for Panama (Figure 13) [25]:

Figure 13. Differentiators and challenges for Panama to grow an entrepreneurial ecosystem.

As will be seen later in this report, we will note two exceptions with these findings. First, we find strong entrepreneurial spirit among Panamanians, but we see a gap in creativity, invention and innovation needed to build scalable startups. The second is the highly disparate resources, assets, and capacities of Panama City compared with David and other non-urban areas of the country. Average salaries are very different. For example, in Panama City a university-educated, middle-class job can yield $1,200/month. With bilingual skills, this number can double. In non-urban, rural regions, salaries appear to average at half that at $600/month.

SCALABLE STARTUP SUPPORT

There are three primary support structures offered in Panama:

- Ciudad del Saber
  - Government-sponsored cluster of academic organizations, technology companies and non-governmental organizations;
  - Created on the former site of Fort Clayton;
  - Located in Panama Canal Zone beside the world-famous Miraflores locks;
  - Primary services offered:
    - Funding access;
    - Physical facilities – coworking, laboratories, meeting rooms, auditoriums, convention center, temporary lodging, residential area;
    - Mentor access;
    - Ecosystem events;
    - Commercial area;
    - Recreational and sports access; and
    - Entrepreneurial training for creatives, researchers, and business and startup leaders.

[25] https://startupuniversal.com/country/panama/

- Founder Institute:
  - Training in Panama City;
  - Global mentoring group;
  - Equity-based services;
  - Access to Angel network community;
- Connections with International accelerators
  - These happen through entrepreneur relationships with U.S., EU, LAC and Israeli entrepreneurs, accelerators, or funders.

We further searched the internet and other channels to see how startup founders aggregate and meet. We found an interesting set of activities and sites active before the Pandemic:

- Digital nomad sites in Casco Viejo;
- Cycling infrastructure along the coastal Cinta Costera and the Amador Causeway;
- Monthly Creative Mornings speaker series;
- Pecha Kucha Night – 20 slides with 20 second stories (derived from Tokyo);
- Global Shaper Hub – local chapter of the international creative organization; and
- Entrepreneurs Organization – chapter in Panama City for peer-to-peer entrepreneurial and investor relationship building.

STARTUP OPPORTUNITIES

From this analysis, one sees several areas of opportunity for scalable startups in Panama.

SUPPLY CHAIN AND LOGISTICS

As noted previously, the pandemic has only sped the need of international efficiency and transparency with regards to supply chain and logistics. Coupled with heightened expectations of world consumers and international inflationary activity due to deficiencies in current systems, innovation is needed and will be rewarded. The nature of the shipping, air, road, and information transportation locus in Panama should make the opportunity for this innovation and testing at scale with collaborative market leaders only logical. Key trends include:

- Asset-light or zero infrastructure models due to integration of modern technologies;
- Integrate internet of things and other technology seamlessly into tracking and deep data collection and analysis;
- Connect demand with suppliers through online marketplaces, interfaces, data integrators and dashboards; and
- Natural lean and agile business model through native-digital conception and implementation.

Deloitte characterized four key roles for startups that illuminate opportunities for Panamanian scalable startups and key examples as competitors in Figure 14 below[26].

[26] https://www2.deloitte.com/content/dam/Deloitte/de/Documents/operations/Deloitte_PoV-Supply-Chain-Startups-Are-Coming-of-Age.pdf

Figure 14. Business models for innovation and supply chain segments with selected startup examples.

	Warehousing and Fulfillment	Express Delivery	Overland Transportation	Ocean/Air Transportation
Broker/ Aggregator	LocaFox Roost Flexe	lugg shutl stuart	**Haven** **nimber** **Roadie** **Transfix**	FreightHub Flexport Freightos
Analyst	Supply Vision CargoBee Loginext	OptimoRoute Rickshaw rivigo	**shippo** **convey** **ShipHawk** **Routific**	**Xeneta** **Windward** **project44** **40ft**
Niche Operator	**MakeSpace** **SwapBox** **cloud fulfilment** **Boxbee**	**Lalamove** **Postmates** **Deliv**	Instafreight shyp EcomExpress	Shipster bluegrace
Technologist	Magazino fetch robotics Righthand robotics	Starship Flirtey Matternet	Otto Macropoint Veniam	Weft Staxxon

Key opportunities for Supply Chain and Logistics innovation can be illustrated in Figure 15 below[27].

Figure 15. Opportunities for supply chain, logistics and data science innovation.

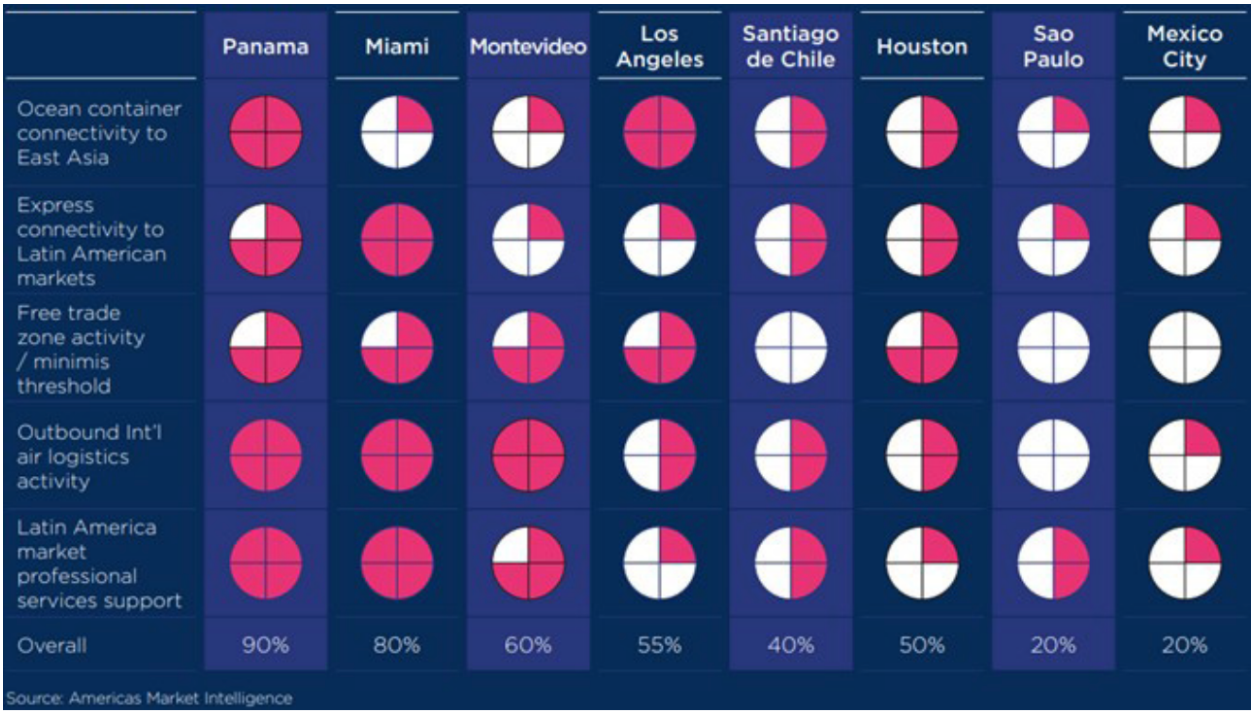
[27] https://www.cldlegal.com/the-republic-of-panama-the-e-commerce-logistics-hub-to-latin-america-and-the-caribbean-investment-opportunities/

These represent strong opportunities for transport and in-region application of innovation to improve Panama's position as a regional logistics hub.

E-COMMERCE

This could be viewed as part of supply-chain and logistics, but we call out these opportunities as separate since they seek to connect source and receiver but also engage the finances of payments and receipts. These also address currently regulatory compliance issues as goods transit through jurisdictions – e.g., the recommendation for "Resolución N°672" and corresponding regulations that will make Panama ready for e-commerce transactions. CLD Legal has analyzed the Global Center of Excellence recently prepared a white paper describing the findings of a study benchmarking Panama's potential compared traditional logistics hub cities in the Americas (i.e., Houston, Los Angeles, Mexico City, Miami, Montevideo, Santiago de Chile, São Paulo) to determine sites for e-commerce growth in Latin America (Figure 16)[28].

Figure 16. Benchmark of e-commerce hub readiness for key cities in the Americas.



The speed of the Canal to lower costs from Shanghai (12 days compared with Miami) combined with superior cargo throughput, 3.9 M TEU's in Panama compared with 1.1 M TEU's in Miami and free trade zone leads to its score. However, location must be complemented by the 6-Ms to bring the programming talent, management, testing, and global finance necessary to not just conceive of opportunity – but realize it. These human factors are NOT considered by this analysis. Currently Silicon

[28] https://www.cldlegal.com/the-republic-of-panama-the-e-commerce-logistics-hub-to-latin-america-and-the-caribbean-investment-opportunities/

Valley leads this e-commerce startups with NO PORT – but a confluence of talent, experience, and capital to draw in Market players. One could see Miami or Houston being logical places for expansion from Silicon Valley with regards to international shipping, or Atlanta, Nashville, or Northwest Arkansas for national transport. The competition is real.

AGRITECH

Changes in global food consumption, the growth of food instability from traditional geographies to cities around the globe, and instability of supply due to recent events – Russian invasion of Ukraine and droughts in India, brings innovation in agriculture to the forefront in global necessity. While Brazil and Argentina have dominated LAC agritech, supply chain and global logistic growth will open to regions with small native markets. With half of the Panamanian population living outside of the urban center and distributed through rural and small cities, Panama's capabilities for strategic growth are real.

Key opportunities are found in[29]:

1. New production environments – hydroponics, aquiculture, urban and indoor farming, or other water and soil conservative technologies;
2. Task mechanization and automation: task and stand-alone technologies, smart irrigation, new materials, large animal, and field-scale manipulation;
3. Crop and animal protection and advanced husbandry: Genetic manipulation (when allowed), bio-stimulants, pesticides, and fertilizers;
4. Big data and precision agriculture: soil and environmental assessment; geographic optimization, remote sensors, integrated hardware/software systems, data to decision systems;
5. Management software: business support, climate, and market access; integration of supply chain and logistics data, education and training;
6. Innovative buying and selling platforms: e-market places, outsourcing, tool-sharing, new funding instruments, risk management;
7. Food processing and distribution: Advanced processing, improved stability, smart storage and packaging, small contracts, digital certification, food safety and traceability, farm to consumer marketing;
8. Innovative food products and services: sustainable proteins, functional foods and beverages, new ingredients and flavors, novel stability strategies; and
9. Bioenergy and biomaterials: biofuels, biomaterials, waste mitigation and treatment, renewable energy, industrial processes and materials.

Countries that are producing more agritech startups show more specialization and larger native markets – as noted for Argentina and Brazil. But Chile and Peru show strong innovation in permanent crops such as fruits through pest control and irrigation technology. Uruguay focuses on its leadership in livestock, while Mexico and Colombia focus on vegetables. Where can Panama win? It would appear with specialty products as it has done with coffee and similar niche market opportunities linked with improved processing, stability, shipping, and marketing. Linking rural lands with clean, green energy offers a way for independence, sustainability, and climate preservation.

[29] https://publications.iadb.org/publications/english/document/AGTECH_Agtech_Innovation_Map_in_Latin_America_and_the_Caribbean_en.pdf

MEDICAL TECHNOLOGIES

Convenings of the Economic Commission for Latin American and the Caribbean have pointed out the accelerated pace of science and innovation during the pandemic period[30]. Indeed, more is needed. This is good news for patients and those in need of innovation, but it means more competition for those who aspire to join in the medical technology race. Primary advances are being driven by large investments in the leading medical sites of the U.S., EU, Japan, China – for example. However, the distribution of vaccines, therapeutics, and other products is being regulated based on ability to pay, with those with less having to wait for distribution. This distribution to non-innovator countries is critical for world health. Further, remote work, telemedicine, digital platforms for health and education, all have increased during the pandemic. It appears that opportunity is present for medical discovery as well as distribution, including supply chain and financial innovation. Further, connectivity linking e-commerce technologies with medicine offer important opportunities to extend care and access. However, standardization of medical regulation and management through state and private systems must be considered for deep collaboration and access.

Despite this opportunity, low investment in R&D, only 0.7% of regional GDP on average in the LAC, and the low percentage of researchers dedicated to R&D (3%), and lack of necessary financing makes innovations to compete with established leaders difficult and ability to scale a solution lengthy or impossible. As with agritech, focus will be critical if one is to innovate, produce and supply new vaccines, therapeutics, diagnostics, or devices. Panama could play a key role as a distribution or value-add partner due to its "hub" location and capabilities.

Although it is attractive to consider the influence, revenue, and access impact of developing drugs/devices/diagnostics IN one's country, there could be other ways to deploy innovation to enhance the standing of Panama in terms medical care. Talent – the area of greatest competition for the region – will demand improved and better access to healthcare. Areas to consider[31]:

- Increase the access to and capacity of the local healthcare systems in urban and rural areas;
- Be the hub for healthcare information organization, flow, and medical sharing through the LAC;
- Engage digital health, IoT, and improved connectivity to make the full costs of a healthy population lower but impacts higher through virtual engagement approaches;
- Create innovation synergies between e-commerce, supply chain and logistics, and other innovation initiatives to improve engagement;
- Improve confidence in healthcare to provide value in disease diagnosis and treatment;
- Decrease fragmentation in the system by encouraging public-private partnerships and use the "hospital" as a primary care site to increase utilization and treatment;
- Financial resources will be necessary to provide not just adequate, but quality healthcare to compete for talent to move and stay in region;
- Integrate healthcare innovation into the system to save money, increase reach and effectiveness of treatment and engage remotely as well as in person.

Telehealth and remote monitoring would be predicted to impact Panama's human health greatly. However, strategies must be adapted to balance practitioner, patient, and profit motivations. Consideration of visa routes to allow foreign practitioners familiar with telehealth to

[30] https://www.cepal.org/en/pressreleases/contribution-science-technology-and-innovation-key-facing-challenges-health-industry

[31] https://www.thedialogue.org/analysis/innovating-healthcare-in-latin-america-and-the-caribbean/ ; https://www.fimeshow.com/en/overview/industry-insights/north-latam-healthcare-innovation.html

practice/administer/lead healthcare facilities to bring in best practices could be efficient. These costs may be spread across an entire facility or system, not in a single department. Executive experience and leadership will be critical to make these offerings sustainable and profitable for the healthcare system.

SUMMARY

Opportunities provide targets and goals. They must be realized through people. To recruit in the Makers, Management, and Members to “be” the scalable startups and the Money, Mentors and Market to “accelerate” the startups, quality healthcare must be available on a growing basis throughout the country. There are many experienced businesspeople, even serial entrepreneurs, who could advise the government on fitted approaches to build private funding pathways to follow public monies and engage anchor companies with innovators.

PRIMARY FINDINGS FROM STAKEHOLDER INTERVIEWS

We conducted interviews with key members of the Panamanian innovation and entrepreneurial ecosystem – members of the government, university, business, and support group sectors. We appreciate the support of Juan Carlos Sosa, SENACYT leadership, and Ciudad del Saber for assisting with these contacts. From these interviews, we identified policies, practices, and culture that promotes or inhibits innovation and entrepreneurship through direct or indirect means. Our collaborators at Ciudad del Saber helped us identified influencers – individuals who mediate between institutional siloes to create connections and cohesion. We found important connections and collaborations between institutions toward defined goals and outcomes that allow ideas to be heard, selected, grown, and ultimately be expressed as financial vehicles (new companies) that can contribute to building the wealth and prosperity of the whole Panamanian population.

75 individuals were officially interviewed, engaged in email exchange, or included in substantial meetings:

1. Ministry of Commerce and Industry
    a. Juan Carlos Sosa
2. Authority of Micro, Small and Medium Enterprises (Ampyme)
    a. Arturo Arango Osorio
3. Ciudad del Saber
    a. Alejandro Carbonell
    b. Cristina Collazos
    c. Carla Donalicio
4. Secretariat National Institute of Science, Technology and Innovation (SENACYT)
    a. Dr. Eduardo Ortega-Barria
    b. Omaira Rodriguez
5. U.S. Consulate
    a. Consul General Jaime Sosa
6. Startup founders:
    a. Ana Reyes - Logistic Cabinet
    b. Alejandra Lizarazu – Tutor Easy, Prom Counsellors, Fundacrae
    c. Val Dess – 3D software designer for architects – Canada and Panama
    d. Sébastien Hilaire – Fitwave
    e. Maria Auxliadora Sanchez
7. SENACYT project leaders:
    a. Dianet Pinillo – Founder, Blind Guide
    b. Rafael Vega Miranda and Dr Axel Chang - Principal Investigator, project “Aparato de regulación térmica para galeras” (thermal regulating device for chicken coops)
    c. Jaime Orozco – Owner, Puertas y Plywood Orozco
    d. Ricardo Lince and Ramon Arango – Founder, Trausty
    e. Karina Wan – Founder, Economia Circular
    f. Edwin Cedeno – Founder, Telcom
    g. Jose de Roux – Founder, Alisa Panama
    h. Jose Herrera – Founder, Innova Organic
8. Nicole Orillac Martinelli – International American Development Bank Lab
9. Alberto De Icazo – SENACYT

10. Victor López Cabrera - Universidad Tecnológica de Panamá (UTP)
11. Susana Lau – EtyaLab startup and foundation founder
12. Diego Eleta – startup founder and President Venture Club
13. Florida State University
    a. Alexandra Anyfanti
    b. Carlos Langoni
    c. Alonzo de la Guardi
14. Aden University
    a. Maria Jose Bustamante
    b. Marcela Muñoz
    c. Paula Vasquez Viera
15. Maria Alejandra Lince – the Port Advisor
16. Melanie Milanes de Meana – The U for You
17. Carolina Orantes – CAPATEC
18. Armando Espino – Ex Director: Urbanización Santa María Business District
19. Orlando Reyes - WISY App
20. Rebeca Vidal – VP Desarrollo de Latin America
21. Alejanro Pachon – Isthmus School of Architecture and Design
22. Roberto Melo – Past CAPATEC President, Escala
23. Lorena Kirchman – Chamber of Commerce, Industries and Agriculture of Panama

Meetings conducted in person during the week of April 18th:

24. Meetings with those engaged previously:
    a. Cristina Collazos, Startup Investment Manager, Ciudad del Saber
    b. Dr. Eduardo Ortega-Barría, National Secretary of SENACYT
    c. Dr. Julio Escobar, Ciudad del Saber Board of Trustees
    d. Dr. Jorge Arosemena, President, Fundación Ciudad del Saber
    e. Alejandro Carbonell, Director of Innovation, Ciudad del Saber
    f. Lic. Alberto De Ycaza, Director of Business Innovation
    g. Paola Franco, Chief of Staff, Executive Assistant, SENACYT
25. New meetings:
    a. Victor Luna Barahona, Rector of UMIP
    b. Dr. Arturo Dominici Arosemena, Director, School of Marine & Environmental Resources
    c. Mgtr. Luis Carlos Solís, Strategic Marketing Director and Advisor
    d. Sandra Lee, Panama Pacifico
    e. Dra. María Héller, Director of Learning Innovation at CTI (Science, Technology and Innovation)
    f. Ing. Violetta Cumberbatch, Director of Capacity Building at CTI (Science, Technology and Innovation)
    g. Mike Magallon, President, TexasExes Panama
    h. Jose Rodriguez, B737 Fleet Manager, Copa Airlines
    i. Gustavo Rivera Aburto, Chief Instructor, Copa Airlines
    j. Pituka Ortega Heilbron, Director of the International Film Festival (IFF) Panama Foundation
    k. Bernardo Ordas Guardia, Co-director of the International Film Festival (IFF) Panama Foundation
    l. Essie Mastellari, Director of the Panama Film Commission
    m. Gloristell Espino, International Project Coordinator for the Panama Film Commission

n. Dr. Juan Bosco Bernal, Rector of UDELAS
o. Dr. Joel Méndez, Dean of the Faculty of Medical and Clinical Sciences
p. Licdo. Luis Torres, Director of Internationalization and Technical Cooperation at UDELAS
q. Daniel Billingslea, Specialist for the Startup Incubation and Acceleration Programs
r. Valeria Mendoza, Transformation Projects Specialist
s. Carlos Rodriguez, Organizational Development & Continuous Improvement Manager
t. Sheida Franco, Coordinator of Business Innovation Projects
u. Ing. Héctor M. Montemayor A., Rector
v. Mgtr. Alma Urriola de Muñoz, Academic Vice Chancellor
w. Mgtr. Vivian Valenzuela, Vice-Rector for University LifeDr. Alexis Tejedor, Vice-rector for Research, Postgraduate and Extension
x. Mgtr. Mauro Destro, Administrative Vice Chancellor
y. Ing. Angelino Harris, Dean of the Faculty of Civil Engineering
z. Ing. Javier Navarro, Director of the Experimental Engineering Center
aa. Dr. José Fábrega, Director of the Center for Hydraulic and Hydrotechnical Research (CIHH)
bb. Ing. Aris Castillo, Director of International Relations
cc. Dra. Casilda Saavedra, Head of the Department of Hydraulics, Sanitary and Environmental Sciences of the Faculty of Civil Engineering
dd. Ing. Analissa Icaza, Postgraduate Coordinator at the Faculty of Civil Engineering
ee. Dr. Francisco Grajales, Professor at the Faculty of Civil Engineering
ff. Dr. Alejandro Avendaño, Professor at the Faculty of Civil Engineering *
gg. Dr. José M. Gallardo M., Researcher at the Chiriquí Regional Center *
hh. Dr. Gilberto Axel Chan, Deputy Director of Research, Postgraduate and Extension at the Regional Center of Veraguas

*Virtually met while the UT team was in Panama

QUESTIONS FOR INTERVIEWS

1. What is your (personal or organization) role in the Panama innovation ecosystem?
2. Who are the people, companies, or groups you serve?
3. What are your desired outcomes from your work and programs? How do you measure success?
4. Which organizations with whom do you most frequently collaborate?
5. What gaps do you see in the Panamanian innovation ecosystem?
6. If you had a “magic wand” what would you change, add or subtract from the innovation ecosystem to create more impact?
7. Any other comments you would like to provide?
8. Who else should I talk to? Would you make an introduction?

KEY FINDINGS

THE 5D'S FINDINGS

Distance:

1. Clear learnings and collaborations between Panama and best practices and organizations in Colombia, Chile and Ecuador, among other nations;
2. K-12 teaching methods and evaluations must be elevated to meet modern skill needs especially technological skills;
3. Universities lack tradition or programs to lead Panama in invention, innovation, and entrepreneurship;
4. Anchor companies do not engage significantly with entrepreneurial ecosystem and startups;
5. Post government grants there is virtually no access to seed funding from private sources;
6. Urban assets and economic activity are relatively well developed but many gaps face rural/small cities;
7. There is a desire for entrepreneurial ecosystem to be build, but mindset, culture and practice must change and disseminated for it to be realized;
8. The unicorn goal is present and may deter the more realistic approach to build a collection of successful companies; and
9. Mistrust exists – between entrepreneurs and government programs (is a true meritocracy being built?) and entrepreneurs and anchor companies (will companies steal my innovation?), or anchor companies and entrepreneurs (will this innovation work or hurt my business?).

Diversity:

1. Exciting to see a "Tropical NYC" in Panama fusing cultures (LAC, EU, Indian, African, Jewish, Chinese, U.S., etc.) with advance finance, services, and international access;
2. There are significant challenges effectively engaging small city and rural residents with innovation – with different values, pace, assets, and goals with the urban half of the population;
3. Panama is a rich country but populated with many poor people;
4. It is unclear how to integrate prosperity for indigenous people without objectifying them through tourism or causing them to adopt majority culture; and
5. Connectivity is a huge issue in smaller cities and rural areas but can also be experienced in Panama City as well.

Dilution:

Through our interview process, we heard from various leaders and entrepreneurs the following priorities:

1. Advanced manufacturing;
2. Information technology;
3. Supply chain and logistics;
4. Accounting and financial services;
5. Pharmaceuticals;
6. Clean energy – especially hydroelectric;
7. Hydrogen hub;
8. Water access and technology;
9. Hub of hubs model – transportation, logistics, data, transportation;
10. Tourism – move beyond "the Canal;"

11. Value-add agricultural products; and
12. Possible communication hub through English proficiency.

Too many to "focus" on…where to start and show success?

Other expressions of dilution:

1. Micro-farms are too fragmented for major exportation and thus lack support and access to larger markets (cited: 1,800 independent coconut farms of several acres each is needed to win one mid-sized grocery store contract in the US);
2. Younger entrepreneurs feel that they have two likely opportunities for funding: SENACYT and the bank. The bank is believed to have unrealistic expectations ($2M ARR). They did not feel that there are many angel investors, nor did they have any feel for early-stage dilutive funding. Most were very opposed to taking on debt; and
3. Many would-be entrepreneurs start "programs" and "trainings" but few actually complete these offering – thus many innovations remain nascent and underdeveloped.

Demand:

1. Startups desire less paperwork for government funds, whereas government wants a documented, wise use of funds;
2. Startups need tech and STEM talent, and the education system produces inadequate quantities as this time in Panama;
3. Startups desire private sector company funding;
4. Risk-averse culture not open to private equity funding strategies with longer than real-estate return profiles;
5. Demand for but reluctance to participate in open innovation programs linking entrepreneurs and large, anchor companies;
6. Demand for a large set of interesting, scalable startups for funders to come to Panama and invest – thus promising startups must leave Panama to find private funding; and
7. Everyone wants to run their own startup support program!! Repetition, redundancy, and need for collaboration exists.

Disengagement:

1. Anchor companies, multi-nationals, Canal Authority, COPA, etc. do not support the entrepreneurial ecosystem, innovation, and connection to commercialization – this needs to change;
2. New banking strategies are needed to assist funding new enterprises – current approaches debilitate later equity round financing;
3. Many people and organizations desire to "dip their toe into the" entrepreneurial support water by participating once – and many do not continue to give to the system;
4. Need for anchor companies to join in an entrepreneurial cluster of software, supply chain/logistics programs and other open innovation formats;
5. The many government groups providing government funding support should consider approaches to pool resources and create joint goals for more impactful use of funds.

HIGHER EDUCATION

The universal sentiment communicated about education in Panama always addressed the K-12 system. It was characterized as inadequate, non-creative, focused on rote memorization, and non-translatable skill development. Further, the differential between the quality of public versus private education was

emphasized as was city versus rural education. In a country that needs advanced STEM talent, education reform was top priority of most people interviewed. While the new "entrepreneurship" education law was seen to be helpful, most thought that it would require 5 to 10 years to really implement, and application would be uneven and biased like other educational programs – especially in rural systems. It was viewed as insufficient.

To evaluate Panamanian universities, we did not benchmark academic programs, ratings, or performance against matched peers in and out of LAC. Rather, we focused on perceptions and sentiments offered by interviewees about the ability of universities to prepare students for entrepreneurial pursuits. In interviews, many pointed out that high achieving Panamanians were almost universally educated OUTSIDE of the country at top U.S., EU, or LAC universities. Below are several common comments of interest:

- University students are expressing increasing interest to start companies;
- Student interest is primarily restricted to dreams and desires since few STEM and entrepreneurship skills, or training are available to move an idea to a real product/service within the educational system;
- Professors are the "first mentor" for students – professors must be inventive, innovative, and entrepreneurial first! They set the pattern for their students;
- There are few professors to guide students toward invention, innovation, and entrepreneurial options;
- STEM education is new to Panama – there is an urgent need to grow in STEM to be competitive in LAC;
- Teaching is the primary role at universities; research is encouraged, but this leads to uneven exposure to innovation;
- There is little cutting-edge research happening in Panamanian universities – little invention, thus little innovation;
- Medicine, engineering, and agriculture are primary research topics;
- No I-CORPS or training programs to assist professors to translate inventions to commercial readiness or collaboration;
- There are few if any strategies or programs to connect student ideas to startup development;
- There are few programs (e.g., internships, challenges, capstone projects, etc.) to effectively link students to established companies outside of job interviews and employment;
- There are few internships to see the difference of working for an established company and a startup;
- The public sector – Ampyme, SENACYT, CDS – are all aligned with innovation and have entrepreneurship as a serious goal, but K-12 and universities are not aligned with these goals;
- Interviewees did not see significant engagement of CDS or other entrepreneur or startup support programs with universities;
- Researchers need to think beyond teaching and own research to innovation and proof of concept;
- A few examples of collaboration programs between companies and universities were collected, including UTP and Banco Henera, Aviation college, PITT Lab with CAPATEC and COPA;
- Students "feel" discouraged – low expectations for good paying jobs and lack of private sector engagement in education;
- Planning happens at national level, e.g., ICT and Logistics plan – but as a new government comes into power, the goals and programs change;
- Universities need continuity with a plan to ensure change and innovation occurs.

- Foreign universities in Panama – Georgia Tech and Florida State University – offer good programs – but cannot scale to impact Panama City or the country
- Similarly, Aden University offers entrepreneurship and IT skills, but lacks the scale and reputation to lead the country;
- Students appear to collect Panamanian culture traits:
    - Resistance to change;
    - Risk avoidance;
    - Go to class, do homework, complete testing, receive diploma and then get a job; and
    - No real motivation to engage in extra-curricular idea-to-product programs.
- University curriculum needs actual training in creativity, training in innovation, training in entrepreneurship;
- Universities should be places where innovation is in the culture – but that is not true in Panama.

SENACYT

Interviewees universally appreciated SENACYT and its programs. The normal governmental turnover every 5 years appears to not significantly affect SENACYT making its leadership, programs, and impact most consistent. Further, the program's (early-stage government funding for startups as grants with no pay back) synergy with learnings from CORFU in Chile, RutaN in Medellin Colombia, and Innovato in Peru was viewed as critical. Seed funding offered:

1. Seed funding: $30-35,000 – no high requirements
2. Innovation company funding: $200-250,000 with more requirements, including bank statements, financials, forms to fill out, project plans, reporting transparency.
    a. Empreso Practora – large established company and small company collaboration
    b. More often large company is just a letter of support
    c. VERY hard to sell B2C in Panama, easier B2B

The process was presented by SENACYT and perceived by entrepreneurs as highly selective. For example, of 86 received proposals in one call, only 7 were funded. Rigor in project is required, but also writing and compliance with proposal contents and implementation and documentation.

However, many interviewees had comments about the programs and desires to see improvements. Comments included:

- "Lots of paperwork" is required to apply, upon award, and throughout grant lifespan:
    - Funding can be so slow that the work is completed, and innovators must pay themselves back;
    - All benefits, such as tax exclusions require "mountains" of paperwork;
    - Some entrepreneurs say that too much paperwork is required making the grants not attractive;
    - Note – we did not directly review the "paperwork" requirements, so we do not have recommendations here – just information.
- Companies are consistently staying in "seed" form or as sole proprietorships
    - Entrepreneurs can see grants as savings account;
    - May not use funds to drive growth of company;
- Where is funding after SENACYT? The lack of VC, Angel or other funding mechanisms leave companies in a "Valley of Death."

Companies offered the following recommendations through meetings for SENACYT consideration:

- Waive university requirements to apply:
    - A university education does not necessarily mean that the innovations will be more sophisticated nor more likely to succeed. One entrepreneur felt that many of her peers were self-taught, particularly within skills like coding, and that this requirement excluded a lot of people like them who are interested in building digital startups.
- More freedom over how they can spend their grants:
    - SENACYT revised how one company could spend their 2-year grant three times, once in the middle of the year, requiring specific expenditures. This occurred due to SENACYT's budgetary circumstances and resulted in one 14-month year and one 10-month year for the company.
- Consolidation of requirements for tax documents showing that you owe no taxes
    - These tax documents are valid for 30 days and are required to receive funding, but SENACYT took more than 30 days each of five times that they requested these documents of one company, so it took months to process correctly. These documents must be retrieved and delivered in person. The suggestion was that the government department printing the documents open an office inside SENACYT.
- A better application portal:
    - CVs had to be submitted as one single PDF, as the system could not accept multiple files, but there was no notification of this, resulting in failed applications after the fact.
    - Budgets have to be adjusted manually in Word—no Excel spreadsheets can be used.
    - Contribute services to the success of the project they are funding, similar to an SBDC.

The success of the SENACYT programs, and those of Ampyme for small businesses (see below), provide critical funding oxygen for companies. However, the reliance on public funds without links to articulated private funding vehicles can lead to unhealthy reliance and lack of resources. Linking in new funding sources would be viewed of strong importance.

ENTREPRENEURS

We had the opportunity to interview a broad range of entrepreneurs – from those with nascent ideas only, to those with a successful Panamanian presence, to those who have international market footprints established. As would be expected, a variety of experiences, stories, and archetypes of people and businesses were discovered. A case study of Wisy is provided in this report as one such archetype interacting inside and outside of the Panamanian ecosystem. Further, student perspectives of Munily are provided. The following points represent a summary of findings and may not directly apply to any individual company:

- Most successful entrepreneurs or managers of scalable startups received university education outside of Panama. This was learned through interviews and comments from those we spoke with;
- Experience and perspective were key to entrepreneurial success. When resource and access reached a block in Panama, those entrepreneurs with U.S. or broader experience or education reached out to non-Panamanian support structures to accelerate their businesses. Many businesses relocated to Canada, U.S. or other as a result;
- Of the entrepreneur interviews we conducted, ~35% could be categorized as traditional small business owners with no true "innovative" offering; 25% would be suitable for NSF I-Corps on topic and stage; 25% would be in a typical technology accelerator in the U.S., and 15% have received significant venture or angel funding;

- The entrepreneurs were split between one group that skewed young (some had just graduated). Entrepreneurs who have received funding or scaled their businesses skewed older and brought more experience to the table. Several had recently moved from established careers or left significant family businesses. Three were serial entrepreneurs;
- Most had deep experience with Ciudad del Saber or the Founders Institute;
- Only the more experienced entrepreneurs (generally foreign educated) were deeply aware of international startup ecosystems or accelerator programs;
- Innovators found it hard to raise funds with just LAC business traction, must get U.S. traction – must move there to engage, build reputation, and find customers in U.S. or EU;
- It is hard to add and grow customer base in Panama:
    - Innovators "make 100 products but not sell one;"
    - Panama could be a great testbed for new products – diversity, connected, small population – but this is not happening;
    - Panama offers established companies with significant innovation needs which could benefit from and sell innovative products and services; but
    - It is very hard to get a minimal viable product or MVP tested in Panama!!!
- Most companies – by far – are in Panama City, with few in David, Colón, or other cities;
- Male CEOs and leadership were common – but new policies and programs promote women founders. It should be noted that many of the most impressive entrepreneurial leaders we interviewed were women;
- Most startups are IT or agricultural in focus for most entrepreneurs. There was not a deep innovation or technology focus from STEM – e.g., engineering, natural sciences;
- Most lamented about the lack of VC, Angel, or other funding – all funding was government sourced;
    - Most said it was hard to find qualified talent at the quantity needed:
    - Most established entrepreneurs looked to Venezuela, Argentina, Mexico, or other countries – even EU – for hiring talent;
    - They said salaries are too high in Panama.
- What talent is needed:
    - STEM technical talent – computer science and engineering, then artificial intelligence, data science, machine learning, etc.;
    - Entrepreneurial talent and experience;
    - Soft as well as tech skills are needed;
    - Panamanians work hard – just need to direct training and engagement. Too few are ready to hire.
- Successful entrepreneurs inspire Panamanian students. We encourage successful entrepreneurs – even those present in the U.S. to partner with university entrepreneurship programs and CDS to provide mentorship for the next generation of innovators.

STARTUP SUPPORT GROUPS

The mindset of Panamanians was repeatedly characterized as "service" or "employee" not "innovative" or "employer." Three quotes express the opportunity and the challenge for entrepreneurs:

- "Panamanians are very creative – once engaged, they can make something from nothing."
- "You must get them through the door" for help.
- "95% of country does not know there is help from entrepreneurs, no understanding for tech or startup world."

The following support groups seek to tap the potential of local entrepreneurs and grow new businesses locally.

CIUDAD DEL SABER

Ciudad del Saber (CDS) is well known and spoken of by virtually all we interviewed. It is known as the most reliable and consistent player in Panama. However, some noted that its reliability and consistent offerings may not provide the freedom to be innovative and dynamic in action. Entrepreneurs note several important offerings and benefits, listed below:

- Offers a center of gravity for entrepreneurship in Panama City;
- Benefited from space for meetings, officing and customer discovery;
- Beautiful and inviting setting;
- Momentum is created through mentor interactions and pitches;
- Met co-founders and built teams there;
- Support of women-led entrepreneurship has been excellent and programmatic in nature;
- Met angel investors there;
- Created a density of contacts – without these opportunities, it is very hard to find banks and investors;
- Wished it offered more connections to big logistics and supply hubs and companies;
- Feels far from main Panama City, with traffic, it will be 30-60 minutes to get there;
    - Once there – feel isolated with no link to downtown or social gatherings;
    - Wish there was more participation at events;
    - No link to non-City places, small cities or rural;
    - For client meetings or market interviews, have to travel back and forth which is very time consuming.

One can see the services and strategies offered by CDS are well respected, appreciated and noted as significantly impactful. There is a desire to see CDS's influence be shared with the center of Panama City and more rural areas.

FOUNDER INSTITUTE

The Founder Institute is also a well-known startup support group. They have completed two cohorts to date. We were told that 40 entrepreneurs started one cohort and only 5 finished. As with their model, they offer strong mentor linkages – locally and worldwide, take an equity position for services and offer events to attract funders. We were told that only one VC attended events from a cohort (not sure which one). The startups that engaged with Founder Institute spoke highly of the training, networks and impact of this group.

PANAMA PACÍFICO

Panama Pacífico occupies a mixed-use development with housing (single family + multi-family condos), some restaurants, office space, industrial space. They offer real estate development facilitation and no extant innovation support or incubation currently. They mentioned interest to partner with CDS and they have possible opportunities around science and business parks. Greater transportation access is needed to make the Pacífico site more attractive.

AEI

Alianza para el Emprendimiento e Innovacion (AEI) helps entrepreneurs to build business and financial models for businesses. They offer a network of allies or mentors and encourage entrepreneurs to build production capacity and sell products outside of local jurisdictions. As an articulator in the ecosystem, AEI seeks to connect entrepreneurs to market and one-to-one relations to expert mentors.

AMPYME

As noted earlier, Ampyme addresses entrepreneurs of need – generally for local small business not scalable businesses. It can provide a $2,000 grant linked to an 80% guarantee loan program up to $20,000. The seed funding seeks to help primarily standard, local small businesses but they desire to impact technology and agricultural businesses. They offer some business training; however, they acknowledge the need for more advanced small business and entrepreneurial training offerings.

SUMMARY

There are many "articulators" in the ecosystem and several solid support groups benefiting entrepreneurs. Where does one go after the startup support groups? "I cannot think of a good accelerator in Panama" was a quote from an entrepreneur. There are few "next step" groups for logistics, agtech, fin-tech, e-commerce, etc. Most entrepreneurs engage with CAPATEC to seek broader networks and possible clients. They engage with CAF or Banco de Desarrollo de America Latina and other entrepreneur-friendly banking and loan access are sought. However, the value of bank loans if one seeks venture financing is doubtful. Collaborations with Georgia Tech, Florida State or other universities can be a track for advanced entrepreneurial training and new ecosystem introductions. Many entrepreneurs seek international accelerators in LAC or hope to be accepted by Y-Combinator as Ivan Barria of Pandata did, followed by Cuanto, Munily, and PayCaddy.

In addition to the lack of local business accelerators and funding access, startups seek laboratories and proof of concept spaces. The lack of laboratories and other resources selects for "laptop" based entrepreneurs who can use personal tools to build and test minimum viable products. Engineering, medical, agricultural, and other solutions requiring fabrication, building, and testing will struggle for support. Finally, all startups struggle to find data or company testers for products and services. As will be discussed under open innovation, the gap of collaboration by larger companies is very apparent.

Common concerns shared are summed up in these quotes:

- "Lots of groups doing the same thing, little sharing of information, support and collaboration;"
- Most groups would "rather compete than collaborate – hard to fund them all;"

Regardless of the numbers of groups and new institutions that are built, a culture and funding model of cooperation and collaboration is needed.

FUNDERS

From interviews and studies, it appears that Panama has sought to find best practices from LAC neighbors to accelerate its entrepreneurial ecosystem. Examples explicitly supplied during interviews included:

- Ecuador – legal approaches, “entrepreneurship law” – make it easier for business registration and work
- Chile – investors, incubators
- Colombia – investors and incubators

Interviews with startup founders point to the importance of funding sources from primarily public sources to get their venture started. As noted previously, the $30-35,000 available through CDS participation was generally the first money into a venture. This moved ventures into the CDS orbit of networking, mentoring, and training. Quickly companies looked to obtain up to $250,000 in funding through SENACYT available to startups with collaborations with larger companies. Following these funds, revenue, bank loans, convertible notes, or funds outside of Panama were sought to support company operations, technology development and growth. Ampyme appears to focus on micro-business – funding, training, and possible ecosystem engagement. They look to help entrepreneurs of NEED, not entrepreneurs of OPPORTUNITY.

Most venture funding has been obtained through regional funds and migration of companies to the U.S. or other countries. The Table below captures the aggregate funding activity of startups from Panama as of June 2021[32].

Table 2. Funding activity of Panamanian companies through June 2021.

Indicator	Total	Panama City	Other**
Number of companies*	230	169	61
Total funding amount in million U.S. dollars	183.7	172.9	10.8
Number of funding rounds	38	31	7
Number of investors	24	21	3

The funding totals are unclear who are the investors and where they reside. It should be noted that >90% of funding is aggregated in Panama City with low participation in numbers and capital to non-urban sites. Crunchbase lists Arca, Digital Currency Group, SevenX Ventures, FirstMark, Ascensive Assets, Y Combinator, Huobi Ventures, and Yield Guild Games as active funders in the region. Announcement of the launch of the Panama Development Fund by the NoTarc Management Group in conjunction with Fuel Venture Capital Partners 2021 is interesting[33]. It seeks to expand technology investments through Central and South America using Panama as its hub. It indicated that there were $7B in infrastructure, real estate, and renewable energy investments in their pipeline. This does not appear to favor new company investments but assist existing portfolio companies to have LAC market access through this initiative as well as make larger investments in projects. Unfortunately, this does not appear to be a new startup funding vehicle – but the VC having Panama presence could be leveraged for relationship and possible new fund creation.

What about local funding sources? Through our ecosystem interviews, it was exciting to see successful entrepreneurs return to Panama to reinvest their time, talent, and treasure in the startup community.

[32] https://www.statista.com/statistics/1246322/startup-investment-key-figures-panama/
[33] https://www.globenewswire.com/news-release/2021/09/28/2304768/0/en/Panama-Development-Fund-Makes-Significant-Investment-in-Fuel-Venture-Capital-Alongside-Notarc-Management-Group.html

The will is there, but the momentum is hard to capture. The Venture Club was set up in 2009 as the first organized investors focused on innovative venture support in Panama. With support from the International Development Bank who provided management cost support, the group formed a hybrid fund - between Angel Investors and Venture Capital. From this $2-3M in private funds, they provided a funding source as well as mentorship or coaching to help entrepreneurs achieve their goals. The goal was to introduce the culture of innovative company growth to Panama. The mission was to introduce into the Panamanian society a philosophy of leadership that will pave the way to the creation of innovative companies. Several investments were made but the success of these was not able to be ascertained. There was desire to grow a follow-on fund of ~$10M so that management fees could be covered. This was not successful, so the Venture Club is more of a loose Angel Network currently.

INNOVATION IN LOGISTICS AND SUPPLY CHAIN

The shipping, air, and road logistics industry are reported as traditional – led by historic companies and with concerns for corruption, skewed agent recommendations, kickbacks and other questionable tactics mentioned. There is a strong push to beat and eliminate corruption through policies, regulations and permits.

However, compliance in action, due diligence across actions and actors is necessary to maintain rights of workers, safety and cleanliness of transport vehicles and vessels, transparency of payments, and rapidity and efficiency of shipped goods. To accomplish these, three factors must be ensured for legality and efficiency, ultimately international competitiveness:

- Transparency,
- Traceability,
- Clarity.

Interviews indicate that although digitization and "artificial intelligence, machine learning" and other claims be made, most supply chain and logistics companies struggle with connectivity, data sharing and maintain records primarily through spreadsheets. If Panama will compete in the world logistics stage, digitization and efficiency must happen quickly, thoroughly, and relationally. **Overall, there seems to be extreme overconfidence due the position and potential value of the Canal and little urgency to improve offerings or bulwark against global competition.**

Further, the logistics and shipping industries appear not connected with other government goals such as integrated, local tourism. Each year, >250,000 crew members go through Panama/year with day off for potential tourism. We were told that they must stay on board vessels and not go into the City or countryside due to a $200 charge to leave and return to the vessel. There is not a link or offering for tourism for crew members such as launch services, shared fees to get to city, tourism itineraries, etc. This appears to be a very large gap and opportunity. But it reflects the disconnection between industries in Panama – each working without collaborating with the other.

1. Need anchor companies and multinationals to collaborate;
2. Open innovation – need big data to show difference and value;
3. Need innovation and entrepreneurship training programs to build new leaders in Panama;
4. Move from "employee" mindset to "talent" mindset in large companies;
5. Need to connect with universities to invent, train and innovate; and
6. Large companies need to not steal or compete for talent with startups.

LARGE COMPANIES

As noted previously, Panama is dominated by large companies and their offerings locally or connected with multi-national businesses. 3M and other technology companies have put facilities in Panama and are pleased with worker access and performance. These are more manufacturing sites, not innovation. Outreach to many other companies did not yield deep conversations. The opinion of entrepreneurs and members of the entrepreneurial ecosystem is that large companies do not know how to work with entrepreneurs, startups from a practical point of view:

- Sharing problems;
- Testing MVPs;
- Co-developing products of services;
- Sharing data;
- Developing business deals;
- Starting joint ventures;
- Encouraging intrapreneurial innovation;
- Disruptive product/service development;
- Etc.

The Interamerican Development Bank Lab's Open Innovation program with CAPATEC is detailed in a case study to illustrate successes and challenges working with large companies.

AVIATION

The Aviation industry offers interest as they have educational collaborations and links to future innovation. For example, the COPA Training Facility:

- Located at CDS, COPA has several full 737 flight simulators to train pilots. Simulators are also rented to other Latin American airlines to train their pilots. Simulator time is in high demand and most simulators are fully booked.
- Innovation at COPA extends from technology, to training to policies. Well-crafted and creative training procedures are important innovations to maintain safety and compliance.
- There would appear much opportunity to synergize with the Canal and associated companies and Authority. There is much shared knowledge, similar problems, and possible shared solutions available.

TOURISM

The Texas Global team spent a day in Chiriquí, which is considered the breadbasket or agricultural center of Panama. It is about 6 to 7 hours from Panama City and borders Costa Rica. The region was found to be a beautiful area with mountains rising and cool temperature at elevation. The team visited a coffee plantation (Hacienda Mamecillo), a coffee estate (Elida Estate/Lamastus Coffee) and a chocolate factory (Perez Perez Planta de Chocolate). Mamecillo and Perez were small family operations with just a few people employed. Elida was larger but still modest. The opportunities for finished products and exports as well as ecotourism was obvious from the visit. Interestingly, the region just launched a coffee trail where you can go from estate to estate and sample coffee. The Geisha coffee grown in Panama is widely regarded as the best coffee in the world and at auctions it fetches the highest price paid in the world. These "family" farms could use support. Perez even discussed how he is white labeling his high-end chocolate bars and product which sell for $8-10 in the store, but he's only getting $2-3 for them from his customer and missing out on so much of the value add because he doesn't know

and have the resources to get into the retail stores. The concept of branded products, regional and global distribution channels can assist with agricultural success and the draw of ecotourism.

One can review the comments surrounding Canal ship offshoring above to see additional gaps and opportunities to connect “land” days with tourism in “Logistics and Supply Chain Companies.”

WISY – STARTUP CASE STUDY

We had opportunity to meet with many exciting and strong startups during the interview process. We thought Wisy was an excellent example of a highly successful Panamanian startup illustrating the common pathway adopted by similar companies to scale outside of Panama. The findings are provided below:

- Orlando Reyes met co-founders, Min Chen, Ricardo Chen at CDS in 2016.
- Innovation began as a game to gather and manipulate data in platform for analytical engine.
- After participation in the Switzerland Startup Summit, they obtained a U.S. Market entry prize.
- MMT Bank proved not a pathway for fundraising but proved to be source of data for experimentation.
- By October 2017, 20 meetings with funders, but no funds yet.
    - Feedback example: Amazon Ventures – raising capital in Panama may create challenges for later stage funding
    - For example, 5% of company could be owned by a bank if it is used to raise money
    - Do not want banks on cap-table
- Company changed strategy – moved bank from ownership position to facilitate external funding
    - Incorporated in US
    - Raised $400K in one meeting, then filled $1.2M seed round
    - Min Chen moved to Silicon Valley
- Pivoted to focus on Retail
    - Tested in Panama, Colombia, Argentina, etc.
    - But hard to raise money with only LAC traction
    - Got into Plug and Play, NASDAQ Entrepreneurship, and Google Women and AI program
    - Focused on companies to collect data from stock shelves, inventory, and sales
- Moved to SAP/IO Acceleration Program
    - Linked to U.S. and Tele Viv partnerships
    - Linked to SAP to sell portfolio
- Added image intelligence into analytics
    - First company to offer
    - New value proposition: Run smarter operations with granular analytics for a complete and updated view of each product category at the store and SKU level. A game changer for retail.
    - Raising a $5-7M Series A in U.S. with Wilson Sonsini.

Key elements of success:

- Panamanian ecosystem, particularly CDS, provided access for team, training, and initial MVP;
- Knowledge and pre-existing connections to foreign resources was critical to engage in competitions, market access, and awards.
- Knowledge and connections to U.S. accelerators and funders for scaling capital.

STUDENT AWARENESS OF STARTUPS

In my Management 327 Innovation and Entrepreneurship course at the McCombs School of Business at UT, Rougier Arango was one of my students. He is originally from Panama. Upon learning of this project, he was excited to communicate his enthusiasm about the potential for innovation in Panama. I include his quote to help show the awareness and energy conferred to students through the success of Panamanian startups. Success begets interest and desire to participate.

> As I told you in class, there are some interesting startups going on in Panama, especially Munily who recently participated in Y Combinator. In the podcast that I will be attaching to this email, Mayer Mizrachi, a known entrepreneur in Panama, interviews Carlos, which is co-founder of Munily and COO. Mayer Mizrachi has also been involved in some startups, lately, he founded GeekyDrop, which actually I thought about when writing on the insecurity and trust issues that Facebook Marketplace currently has, in my understanding GeekyDrop functions as an intermediary between the buyer and the seller, mostly focus on electronics and expanding to other product categories, they have a really interesting procedure for authentication when you create an account and some interesting policies going on, all to create a safer marketplace. On the other hand, Munily is a startup that focuses on security for residential places, I didn't finish the podcast but from what I heard, they want to become an app that facilitates and integrates all kinds of services for residential places through their platform, in example: you would be able to set up internet connection when you become a new resident of the place, and so on. In the video, they go off-topic every once in a while, and bounce back between politics, the startup landscape in Panama in comparison to other places in Latin America, and other topics, some of which might not be of interest, but still, I believe there is good content, especially now that you are traveling to Panama. Hope you enjoy learning about this interesting startup.
>
> Best,
> Rougier

The purpose of this quote is to communicate the interest startup success has among Panamanian students – even those in the U.S. They are aware of the challenges of funding, market access, and innovation in Panama and across the LAC. However, with positive role models such as Wisy and Munily, a pathway for young innovators is blazed and can instruct future action. We did not outline the Munily startup journey but wanted to use student perspective to guide recommendations. We encourage the founders of successful Panamanian startups to return to Panama and engage university students and CDS innovators as mentors – inspiring and directing – so more will follow in their footsteps.

OPEN INNOVATION PROGRAM - INTERAMERICAN DEVELOPMENT BANK LAB

The Interamerican Development Bank Lab launched the “DEVELOPMENT OF AN ECOSYSTEM OF DIGITAL BUSINESSES: A CASE STUDY IN PANAMA” project with CAPATEC in 2018 (Figure 17).

Figure 17. Front page of report.

As project leads Mariana Bernés and Xoán Fernández noted, “Panama's economic development the last decade has not been reflected in an improvement in its capacity of innovation, which is lower than that corresponding to countries of its income level. The "Global Innovation Index 2020" places Panama in position 75 among 131 countries, having fallen several positions with respect to previous editions. “ The authors graciously shared their report with us. The interview notes and report provided materials for this case study – some elements are drawn as English translations from the report.

The digital business and open innovation connected project was initiated to help Panama initiate innovative systems, metabolize innovation through startups or other vehicles, and encourage large companies in the country to move technology into their practice so they will be competitive in the coming decades. Digitization especially in the supply chain and logistics space will determine winners and losers in the modern economy – especially of Panama. With Panama being a potential hub of hubs in supply chain, physical and digital logistics, improvement is necessary.

This was a challenging project due to culture – that of established companies toward innovation integration, change of business practice, and collaboration with small companies. These challenges along with the COVID-19 pandemic delayed and limited the program overall. As the project leaders reported:

> Anchor companies are largely unaware or mistrust the technological capabilities of local startups and suppliers. The startups do not have access to or fear collaborations with large companies due to concerns of appropriation of their products, technologies, intellectual property or even a hostile takeover. Finally, Panamanian universities do offer systematic ties or strategic with corporations, working, in generally disconnected from the local industrial sector.

A further challenge was funding – the seed funds from the IDB were not effectively matched by SENACYT and AMPYME, and anchor companies due to leadership changes and pandemic economic shock. However, the pandemic itself offered a new approach through Idea-a-thons where:

1. The large, anchor companies provided details into their pandemic-induce challenges to entrepreneurs;
2. The entrepreneurs developed a solution proposal;
3. With support and feedback, entrepreneurs build MVPs that could be tested by companies.

Through this process it was hoped that MVPs could be adopted by large companies for use. Training and mentoring were provided to entrepreneurs so that they could define problems, propose solutions, and pitch solutions to anchor companies.

Pitch events benefited from support from local and regional authorities: the first was a $20,000 convertible debt note from Escala Latam, the second provided by Panama Maritime Chamber that encouraged member companies to test solutions, and the third by AMPYME with its internal company financing program. The key goals achieved included:

- Engage innovators in the ideation to commercial MVP collaboration processes;
- Get anchor companies to share challenges with innovators:
- Break down siloes startups and anchor companies; and
- Simulate linkages between knowledge, innovation, and commercial application of new ideas.

Additional data detailing engagement and outcomes is provided in Figure 18 below from the report.

Figure 18. Open innovation project outcomes.

This program created an important template for ideation, testing, and collaboration between startups and anchor companies. It is an excellent start to open innovation in Panama. This model could be used beyond digitization to other logistics, supply chain, medical, agritech, and markets.

The program uncovered several key challenges for the Panamanian ecosystem, including:

- Reluctance of anchor companies to engage with innovators in solution creation;
- The desire by anchor companies to use contracts and other traditional mechanisms for business dealings not appropriate for early innovation;
- There was need for capital, expertise, and collaboration to turn an innovative idea or MVP into a possible product or service. This was not offered; and
- Funding for the program to induce participation by top entrepreneurs, continued cycles, and learning.

As the authors state, “Open innovation implies interconnections both institutional and personal, arising from knowledge and mutual trust.” Such interconnection of goals, development and trust necessitates new business mechanisms. The recognition of risk, management of future value from early-stage innovation, and creative business deal structures where all parties - anchor companies and innovators are fairly treated - must be developed. Models exist for each but companies in Panama are not familiar with these practices. Creating joint investment models to build trust, build new products, implement new business models, and share profits are essential.