



# **COSTA RICA AND INDUSTRY 4.0**

Partners in Technological Excellence  
A PROCOMER white paper

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# Executive Summary

With an estimated global market value of US\$665 billion, the Fourth Industrial Revolution – Industry 4.0 for brevity – is an example of how digital technology is becoming a far-reaching impactful force of socioeconomic change, transforming how the world approaches the productive use of technology in all aspects of business and in life.

As digital becomes more integrated with the physical side of manufacturing, companies in Costa Rica are making huge strides towards successfully positioning themselves as experts in this transformation. Players in this segment are focusing on some of the most globally in-demand technological categories, including cloud computing, big data, internet of things (IoT), robotic process automation (RPA), and artificial intelligence (AI), among others, all of which support the growth and evolution of Industry 4.0.

In a 2019 study of Costa Rica's Industry 4.0 competencies and offerings, PROCOMER was able to uncover a vast amount of valuable and insightful data that will guide business leaders on their decision to partner with world-class, value-added partners in technology. The

objective of our research was to understand the level of experience in Costa Rica's Industry 4.0 sub-sector while determining the potential to scale business models internationally.

What we found was that the country's technology players are developing products with high-value applications in Industry 4.0 that are primed for global scalability. Successful examples of this include the use of IoT sensors and drones in the agricultural sector, automation in the life sciences sector, and Big Data in the food industry, which is helping to identify consumption patterns and market trends.

Reflecting on deeper analysis, it's clear that the country's Industry 4.0 companies are helping their clients with the challenges of innovation and go-to-market strategies, revealing important competitive opportunities and fostering growth through valuable cross-border partnerships.

This white paper uncovers the key findings of the study in more depth and gives readers exclusive insights into how Costa Rican companies support global clients in their exploration of Industry 4.0, both now and into the future

# Costa Rica:

## A Hotbed of Industry 4.0 Activity

As a key driver of continuous transformation around the world, ICT innovation is radically altering the way we produce, consume, trade, and even work.

Although many of today's most impactful technologies have been in existence for some time, companies are discovering new ways to combine their benefits and create significant disruptions in numerous industry verticals. Industry 4.0 is linked to a series of these disruptive technologies, each of which has the potential to revolutionize economies and societies on a massive scale.

In this PROCOMER study, we intend to focus on the most prevailing Industry 4.0 products and services in Costa Rica, along with their overall impact on the technology ecosystem, national employment, export partnerships, and enterprise revenue streams.

### SNAPSHOT OF THE SUB-SECTOR

According to PROCOMER's extensive surveys and interviews, Costa Rica is home to a total of 450 companies offering ICT products and services, such as digital transformation, process automation, software development, technology integration, and product creation, among others.

Of those 450 companies, 56 (12%) represent

the sub-sector of the ICT industry that specializes in Industry 4.0 technologies, including cybersecurity, IoT, AI, cloud computing, blockchain, RPA, and others. The majority of these companies (80%) are SMEs, with 30 or fewer employees.

### EMPLOYMENT DISTRIBUTION

Companies in the sub-sector directly employ 970 staff members on Costa Rican soil, with an average of 17 people per company. The highest concentration of Industry 4.0 specialist providers is in the Central Valley, with 73% in San Jose, 14% in Heredia, 7% in Alajuela, and the remaining 5% in Cartago.

Some companies have operation centers and decentralized workplaces located in Perez Zeledon, San Ramon, Naranjo, Ciudad Quesada, Guanacaste and Limon, allowing them to cast a wider net when hiring human talent and thus presenting a more competitive cost structure to clients.

Three-quarters of the Industry 4.0 companies we interviewed are either training their teams internally, bringing in international advisers to enable higher specialization, or leveraging production centers abroad for their technological or HR requirements. The remaining 25% are facing challenges in this area, such as a lack of available talent, high cost of training, and limited access to specialized education programs surrounding Industry 4.0.



## EXPORT CAPACITY

Costa Rica's Industry 4.0 specialists are seeing good levels of foreign demand for their offerings. On average, 44% of their sales in Industry 4.0 technologies are represented by exports, showing experience and capacity to capture customers abroad.

The United States is the most popular destination for exports, with 40% of exporting companies boasting U.S. customers, followed by Mexico (27%), Colombia (21%), Guatemala (17%), and Canada (10%). The sub-sector exports to most countries in Latin American and the Caribbean, with some companies extending their reach to European countries like Spain (4%), the United Kingdom (4%), France (4%), Finland (2%), Netherlands (2%), and Ireland (2%).

This widespread client footprint is proof that Costa Rica's Industry 4.0 technology providers are already overcoming the challenges of cross-border collaboration, positioning them as strong partners and highlighting the ecosystem's potential to become a one-stop-shop for foreign companies.

## SALES AND CLIENT PROFILES

Costa Rica's Industry 4.0 companies describe their customers as being at the vanguard of the Fourth Industrial Revolution, primarily focusing on innovation and long-term

benefits rather than the cost of services. These clients value the benefits of resource optimization, process efficiency, organizational transformation, and competitive advantages that come with the application of Industry 4.0 innovations.

In terms of client verticals, the food industry accounts for 40% of all Industry 4.0 products sold in Costa Rica, followed by medical devices (35%), pharmaceutical (23%), and agricultural (21%). On the services side, 42% of companies report sales to the logistics and distribution sector, followed by information technology (31%), banking and finance (29%), and entrepreneurial services (29%).



The main difficulties that clients come up against internally are lack of investment into Industry 4.0 technologies, human resource issues surrounding technology implementation, and sub-par data management practices, according to their partners in Costa Rica. These obstacles – though inherently challenging – are not insurmountable, particularly for organizations that focus on diversifying their partner network, both locally and abroad.

# Targeted Technological Focus

The country's Industry 4.0 offering is comprised of over 16 technology categories, with companies specializing in an average of 3 at a time. Here we break down the top 10 technologies in Costa Rica in relation to their economic potential and impact on the subsector.

## CLOUD COMPUTING

**Global Market Value: US\$272 billion, 13% CAGR through 2025.**

Cloud computing enables businesses to operate both hardware and software resources over the internet, including services in business process, infrastructure, security, and others. As a platform for open-source collaboration, cloud tech allows companies to centralize processes and information while expediting and refining research that can boost gains in their industry.

In Costa Rica, 54% of Industry 4.0 companies offer cloud computing services, making it the most prevalent technology in the sector. Avantica is a notable player in this space, offering several cloud migration and cloud professional services to nearshore clients.

More examples include Altus Consulting, which was named a CISCO Digital Transformation Partner for its contribution to the development of cloud applications for omnichannel CISCO solutions, while companies like Smartsoft, Infoware, Legadmi, and Toursys have each developed unique

Cloud solutions with applications in fraud prevention, project management, and business management.



## INTERNET OF THINGS (IOT)

**Global Market Value: US\$190 billion, 29% CAGR through 2025.**

IoT is based on networks of low-cost sensors for data collection, monitoring, decision-making, and process optimization. It has significant applications in security, data management, real-time analytics, and network bandwidth management, making it a driving force in the evolution of Industry 4.0.

Almost half (46%) of the companies in Costa Rica's Industry 4.0 ecosystem specialize in IoT offerings. Moreover, the country is currently the second most well-prepared to implement IoT solutions in the region, according to a study by Deloitte and the Center for Telecommunications Studies in Latin America. The conditions are right for Costa Rica to leverage IoT as a valuable ecosystem across both local and international markets.

Costa Rican company Lantern Technologies is one of the country's most important players in this segment. Lantern develops IoT solutions in three major technological areas—Smart Industries, Smart Farming, and Smart Cities—specializing in innovative IoT applications, augmented reality, cognitive computing, artificial intelligence, and machine learning.



expertise, Lantern has been an attractive partner for U.S., Central American, and European clients looking to implement next-generation IoT solutions and compete in Industry 4.0.

Read one of Lantern Technologies' success stories in the medical devices industry here.



## CYBERSECURITY

**Global Market Value: US\$116 billion, 11% CAGR through 2025.**

The potential impact of Industry 4.0 cybersecurity incidents can be devastating, with manufacturers especially vulnerable to production downtimes, damage to equipment, or product spoilage, leading to possible financial and reputational losses.

Cybersecurity products or services make up 23% of the offering in Costa Rica, with products and services ranging from enterprise and endpoint security to cloud, networks, mobile security and more.

In this segment, ATTI Labs stands out above the crowd with its Cyberlabs division, the first of its kind in Central America and the Caribbean. ATTI Cyberlabs provides managed cyber defense services and customized solutions for public and private companies, as well as specialized training. One of ATTI's flagship products is Shockwave, a methodology that enables organizations in all verticals to test and analyze their security practices, resulting in a tailored roadmap of

cyber maturity and a strategy for increasing security throughout the company.



## BIG DATA AND ANALYTICS

**Global Market Value: US\$36.8 billion, 16% CAGR through 2025.**

As manufacturing processes become more digital and automated, they also become more reliant upon how Big Data is collected and analyzed. Processing data is vital for Industry 4.0 practices such as energy management, process optimization, quality monitoring, and predictive maintenance of machinery and equipment, among numerous others.

Exactly half (50%) of Costa Rica's Industry 4.0 companies currently offer Big Data and Analytics products or services, providing cognitive software platforms, enterprise data warehouse optimization, data storage, analysis, and other related IT services.

One of the pioneers in Costa Rica's agritech industry, Technagro, has developed a big data application to support the entire operational and supply chain process in the industry, from crop estimates, management dashboards, and traceability to business intelligence, packaging, maintenance, and equipment control.

Another example is Inventum, a company that develops affordable big data and advanced analytics solutions such as real-time KPI dashboards, natural language processing applications, predictive analytics, and intelligent visual inspection tools, among others.



## ARTIFICIAL INTELLIGENCE (AI)

**Global Market Value: US\$21.5 billion, 37% CAGR through 2025.**

The application potential of AI in Industry 4.0 is massive. When combined with Big Data, its predictive capabilities make it suitable for fostering more precise, higher-quality manufacturing, lower operational costs, less downtime, and fewer injuries on factory floors.

Approximately one-third (36%) of Costa Rica's Industry 4.0 companies currently specialize in AI, with most offering development capabilities and engineers with related programming languages, such as Python. Some examples of this are Kinetos, Dnamic, Symbiotic and Grupo Babel, which leads Costa Rica's AI implementation with Power BI solutions.

IndigolA is another notable player, combining AI and IoT to develop Industry 4.0 solutions for the agricultural sector. The company has built autonomous drones that optimize the agricultural process by fumigating fields, identifying planting patterns, analyzing reductions in production, and delivering environmental alerts, among other tasks. IndigolA was the first company in Central America to develop this type of solution.

In one case, IndigolA's drones were programmed to capture aerial photographs to detect healthy and unhealthy crops, vastly

reducing the time it would take to collect that information manually. Along with cutting operation costs between 40% and 75%, productivity costs by 35%, and the use of herbicides and insecticides up to 50%



## 3D PRINTING

**Global Market Value: US\$9.9 billion, 20% CAGR through 2025.**

Viewed as a cornerstone of digital manufacturing, 3D printing is a key part of the next manufacturing revolution. It has applications in prototyping, product development, low-volume manufacturing, medical products, and more, making it a competitive technology to be a part of.

In Costa Rica, a modest 5% of the country's Industry 4.0 companies offer 3D printing services, such as direct metal laser sintering, multijet fusion, selective laser sintering, fused deposition modeling, stereolithography, and more.



## X-REALITY (VR/AR)

**Global Market Value: US\$7.9 billion, 28% CAGR through 2025.**

In the world of Industry 4.0, the combination of augmented reality and virtual reality creates new ways for companies to interact with machines or tools, overlaying useful information onto a worker's view of the real world. The adoption of XR represents a paradigm shift in the use of functional interfaces and is expected to result in big business benefits



X-Reality is a focus for 16% of the companies we interviewed, with specializations in software development kits, cloud-based services, and VR content creation for cross-border clients. For example, X-Reality solutions provider WOW Emotions has carried out more than 300 successful XR projects for important brands and companies in Latin America, Australia, and the United States.

Another example company is Pixdea, which combines virtual reality with applications designed for experiential learning, mainly for school-age students, as a means to improve the process of teaching and transform traditional learning dynamics.



## **SIMULATION**

**Global Market Value: US\$7.16 billion, 13% CAGR through 2025.**

Simulation involves the digital imitation of a real-world process or system, giving companies the ability to study that process or system in a controlled, repeatable environment. As it relates to Industry 4.0, simulation technology allows organizations to identify manufacturing bottlenecks, find new opportunities for cost savings, and validate performance validation, among numerous other benefits.

In Costa Rica, 29% of providers specialize in this technology, both on-premise and cloud-based. As an example, Processim Labs in San Jose has developed an app that simulates a medical device manufacturing company with two independent production

lines, creating an educational experience for students of business or manufacturing.



## **BLOCKCHAIN**

**Global Market Value: US\$1.6 billion, 47% CAGR through 2025.**

With the highest growth projection in the list, Blockchain is a secure, robust data storage technology that has numerous Industry 4.0 applications outside of its cryptocurrency roots. One example of many is that industrial blockchains could include identifying information on products or components that would help to deal with quality problems with high accuracy.

Provided by 16% of the Industry 4.0 companies in Costa Rica, Blockchain still has plenty of room for growth in the country. However, companies like EOS Costa Rica see the potential and are offering training programs to increase opportunities in the blockchain space, as well as providing infrastructure, development services, and open-source tools.

One of the most well-known players in this space is Nimiq, which has launched a simple, secure and censorship-resistant cryptocurrency, built on blockchain technology with the goal of enabling the most accessible, censorship-resistant payment solution on the market.

Covalent is another notable example, with its focus on making blockchain and DLT technology accessible enough to enter the mainstream. The company's most impressive solution is Forma, which allows organizations to deploy and operate a multi-cloud blockchain without risking vendor lock-in.



## ROBOTIC PROCESS AUTOMATION (RPA)

**Global Market Value: US\$1.3 billion, 17% CAGR through 2025.**

Robotics is widely used in several industries to increase operational efficiency, productivity, and levels of compliance, but as digital transformation impacts the manufacturing industry at a higher scale, new use cases for RPA are becoming apparent, such as bookkeeping, maintenance, and administrative tasks, among others.

Costa Rica has one of the strongest shared services and BPO industries in Latin America thanks to decades of learning and growing through various industry disruptions. Today, several multinational and local BPO providers are beginning to implement new RPA practices to better serve their clients, such as Auxis, Sykes, and many more. In these instances, automation is of particular interest to industries like cosmetics, consumer goods, retail, and manufacturing.

One example in this segment is Sabana Tech, a company that specializes in RPA and AI solutions in the food, financial, insurance, and human resources industries.

Another player is Vester Business, which counts one of the largest and most prolific telecommunications operators in Latin America among its clients. For this particular client, Vester leveraged its RPA capabilities to implement an online emergency plant monitoring tool that can communicate and send operational signals in real-time, establishing the technology in more than 2,000 locations. In the health sector, Vester has implemented RPA at medical centers where the tools collect real-time data on terminal patients enabling treatments from a monitoring center.

With the same coverage as AI, 36% of Costa Rica's Industry 4.0 companies work with RPA, highlighting how both technologies may be attractive to the same companies.



# Industry 4.0's Collaborative Future

No matter where a company is located, solid business partnerships are essential to developing disruptive Industry 4.0 technologies. These relationships flourish when they allow for a better understanding of the client company's production dynamics, leading to successful prototype tests and high-value models of cooperation.

Organizational culture is also vital for capturing value from the Fourth Industrial Revolution, part of which involves working with multicultural teams that can foster innovation and are free to experiment—most of the fast victories in Industry 4.0 come from these experimentations into operational improvements.

Global companies looking to expand their Industry 4.0 capabilities should consider Costa Rica, where they can find strong technology partners that have been innovating and supporting their cross-border clients for several years.

## **CHOOSING SUITABLE INDUSTRY 4.0 PARTNERS**

Before jumping into a new partnership, it's important to create and assess a comprehensive portfolio of suitable technology providers and third-parties. Industry 4.0 is disrupting the traditional model of working with single suppliers and groups of specialized, so the value-added, integrated partners are becoming far more beneficial to organizations.

Look for partners that can demonstrate a customized, industry-specific approach to technological products and services, as they will often have a better understanding of their customers' business and will have developed thorough protocols for safeguarding data in that particular sector.

Furthermore, companies on both sides of the partnership should make great efforts to visualize and quantify the return on investment associated with Industry 4.0 innovations, primarily through savings based on productivity and operations costs. This is a collaborative process that requires strong communication practices, so look for partners that can communicate in your language—both your native mother tongue and industry language. The companies profiled in our recent study are mainly dedicated to applying, providing, or commercializing solutions and services as third-party providers. Even so, it's more important that companies focus on implementing a limited number of Industry 4.0 technologies instead of trying to cover all bases at once, especially those organizations in the manufacturing sector.

Together, Costa Rica's providers represent a one-stop-shop for Industry 4.0, offering world-class, value-add services and talent for attractive prices, so we recommend considering the nation as part of any organization's Industry 4.0 vendor procurement targets.

# About PROCOMER

We are the Government Agency responsible for promoting exports of Costa Rican goods and services worldwide. We are a facilitator to introduce you to the best Costa Rican companies, products, and services. Our goal is to establish a mutually beneficial business relationship that helps your company to grow internationally. If you are sourcing products and services, we are your key contact.

PROCOMER is a powerful network of professional experts understanding business problems to match international companies with the right solution partners in Costa Rica. We are constantly studying and reviewing the mechanics, foundation and business models of industries like: Agriculture, Food Industry, consumer goods, education, advanced manufacturing industries (engineering, medical Device, aerospace), software development in verticals like banking and supply chains, Creative technologies, and more. We not only provide expert advice on each

industry but also provide case studies about the application of the new technologies in various industries.

We invite worldwide companies and organization to contact us to learn how we can support your growth:

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