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# The Role of the Orange Economy in the Digital Age: An Exploratory Study in Costa Rica

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**Abstract:** The emergence of the *orange economy* in the digital age is vital in boosting economic and social progress, particularly in culturally rich nations like Costa Rica. Often referred to as the creative economy, it spans activities such as arts, culture, design, music, and audiovisual industries, nurturing cultural diversity and national identity while also creating jobs and stimulating innovation. In Costa Rica, this economy thrives due to its dynamic cultural landscape and dedication to sustainability and social inclusion. However, the shift toward digitalization brings both opportunities and challenges, such as incorporating innovative and revolutionary technologies that enable the creation, distribution, and consumption of creative goods and services. This research aims to examine these barriers and offer solutions via a qualitative method rooted in action research. Data were gathered through case study review and document analysis, with thematic categorization methods used. Findings indicate that restrictive administrative procedures and insufficient digitalization hinder business growth. Technology-based companies emerge as crucial for measuring the *orange economy's* impact and driving innovation. Among the recommendations are digitizing and simplifying administrative chores as well as using governmental policies encouraging technological usage to support economic development, thereby improving the engagement of the technology-based industry and building a more inclusive and effective ecosystem.

**Keywords:** orange economy, creative economy, digitalization, cultural heritage, disruptive technology, crowdfunding

## 1. Introduction

Particularly in light of the digital age, the *orange economy*—a term that sums up the intersection of creativity and economic development—has become more crucial in guiding Costa Rica's economic landscape to be rebuilt [1]. Emphasizing the necessity of the *orange economy* in forming national development through digital innovation, this introduction aims to provide a comprehensive picture of the effort. Costa Rica is a special case study as its rich cultural heritage and rapid adoption of technology allow countries all over to navigate the complexities of globalization to remain unique [2]. This study is to investigate the dynamics of the *orange economy* in this digital world, thus clarifying how one may employ creativity for economic growth.

Beginning with a thorough awareness of the *orange economy* and its relationship to Costa Rica's economic growth helps one better appreciate the scope of this study. Areas including arts, design, entertainment, and media driven by creative industries—that is, the "*orange economy*"—are referred to as Amado Mateus, Guzmán Rincón, and Cuero Acosta [3]. Building on this basic knowledge, it will go into the whole definition and breadth of the *orange economy*, where it will investigate how the small and medium enterprise (SME) sector in technology-based companies interacts with more general economic patterns in Costa Rica.

In Costa Rica, the concept of *the orange economy* has been in existence for approximately eight years, and efforts have already been made with various government institutions to promote it [4]. However, Crecente, Sarabia, and Teresa del Val [5] and Zaldívar [6] agree that there are few success case studies on this topic and even fewer on specific success cases in the technology-based sector as part of the *orange economy* in the country. Therefore, the present research contributes to the identification of relevant factors to guarantee entrepreneurial success.

Also, technological advances and high labor demand have driven a significant increase of professionals in the technology-based sector, fostering innovation and the creation of new ventures within this growing economy [7]. However, the transition from creative ideation to launching new businesses remains uncertain due to obstacles such as resource allocation; for instance, during the COVID-19 pandemic, many startups opted to market their products informally, which accelerated processes but also led to the demise of companies that failed to digitize and adapt [8].

Therefore, it could be thought that to participate and achieve success in business objectives in the *orange economy*, it is enough to have talent, generate formal income, and maintain continuous innovation to remain in the market [9, 10]. However, when identifying empirical evidence that demonstrates that the use of the *orange economy* helps with the achievement of business strategy in a state of the art, it is observed that there are not enough documented studies, which opens the opportunity to explore this knowledge gap and contribute scientific knowledge in this area.

This allowed us to establish the research question that guided the present study: What are the main success factors when using the

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*orange economy* to achieve business goals? To achieve this goal, the analysis of a successful case study in the technology-based SME sector in Costa Rica was proposed, mainly due to the resilient aptitude of the business sector in the country and its attitude to promote models based on the *orange economy*, combined with the challenges and difficulties that this business sector must overcome due to bureaucratic obstacles, financing limitations, and limited access to crowdfunding, among others [11, 12].

Therefore, the results of this study contribute to the business sector by offering a vision of the path to follow for the achievement of the business strategy with a sustainable approach and paving the way toward the 5.0 revolution.

## 2. Literature Review

The *orange economy* encompasses a diverse set of economic activities linked to the cultural and creative industries, including visual arts, design, content software, video games, advertising, and other creative services [13]. Also, Ferreiro-Seoane, Llorca-Ponce, and Rius-Sorolla [14] and Malavera Pineda, Malavera Pineda, and Calle Piedrahita [15] agree that it is a set of activities that, in a chained manner, make it possible to transform ideas into cultural goods and services, whose value is determined by their intellectual property content. Global consolidation of this idea has also been facilitated by organizations such as the United Nations Educational, Scientific, and Cultural Organization (UNESCO), with its term cultural and creative industries, and the World Intellectual Property Organization (WIPO), with its concept of copyrighted industries. This concept stems from the description of the creative economy, which characterizes this system as a tool for the creation, trade, and consumption of creative goods [16, 17].

Increasingly acknowledged is the ability of the *orange economy* to support artistic and cultural sectors of economic development [18, 14]. Analyzing the corpus of current studies on this topic helps one to grasp its unique qualities and cultural consequences, especially concerning Costa Rica. Apart from creative activities, the *orange economy* is progressively acknowledged to include sectors like digital media, music, movies, design, and digital tools [19]. These industries improve cultural identity and drive invention, therefore benefiting society.

One of the main characteristics of the *orange economy* is its fit with economic theories of creativity and invention [20, 21]. Many models have been suggested by researchers to show the mutually reinforcing link between innovation and economic growth. For example, the creative economy is often understood through the prism of "clusters," wherein many kinds of companies and firms cooperate to boost output and innovation [22, 23, 24]. Costa Rica's attempts to create a creative ecosystem therefore show how these ideas may be used to show how regional and cultural elements might raise the profitability of investments in the creative sectors [25].

Another important issue that has been investigated in the literature is the part that digital transformation contributes to changing the creative scene. New technologies are forcing creative industries to change, drastically influencing production as well as consumption [26, 27]. Digital platforms have democratized content dissemination, therefore allowing a wider reach and engagement formerly unattainable [28, 29]. Costa Rica is a shining example of how such developments may help local artists and producers access overseas markets, thus fostering a combination of local culture with worldwide trends [30, 31].

Moreover, various research studies underline the advantages and difficulties related to the *orange economy* in Latin America. Countries are realizing their cultural treasures on a regional level and using them to attract local as well as international creative sector investment. Still, problems like inadequate money, poor infrastructure, and legal restrictions continue [32, 33]. According to the literature, tackling these issues is essential to guarantee the viability and expansion of the *orange economy* in different areas [34, 35]. The qualitative effects on local communities can remain poorly evaluated even with the investments being made.

The Interamerican Development Bank (IDB) classifies the creative economy into three fundamental components: (1) the cultural economy, which includes traditional artistic activities such as cultural tourism and cultural heritage; (2) the creative industries, which encompass innovative media such as design and video games, and areas that support creativity, such as research; and (3) intellectual property rights and technical expertise [36]. These activities are essential for preserving cultural heritage and fostering innovation and highlight the creativity in industries to generate significant global revenues, contributing US$2,250 billion and 29.5 million jobs, with Latin America accounting for 6% of revenues and 7% of jobs in the sector [37].

Costa Rica has current studies that demonstrate opportunities within the state of the art to identify the gaps in interaction between digitalization and the orange industry. Although the research has looked at world patterns, particular regional evaluations are few, emphasizing Costa Rica, a thorough investigation of how digital technologies affect local creative processes and the distinctive cultural narratives resulting from these crossroads is much needed. For example, the emergence of music streaming services has changed the way local musicians present their work; nonetheless, the consequences of these developments on conventional cultural representations are not fully known [38, 39, 11, 40].

Measuring the economic impact of the *orange economy* faces significant challenges, due to the intangible nature of many of its contributions; since the introduction of the Culture Satellite Accounts (CSA) in 2012, Costa Rica has achieved greater precision in assessing the contributions of the creative sector [41]. According to the Ministerio de Cultura y Juventud, more than 11,000 cultural enterprises were registered in 2015, which employed more than 42,000 people and generated 2.2% of the national gross domestic product, and CSAs have included only a limited subset of creative industries, such as video games, within the audiovisual section [42, 43].

Despite the progress made, SMEs face numerous obstacles to formalization and access to the benefits of this economy, as formalization, an essential requirement to participate in the formal market, access financing, and export, is a complex process that can take up to four months and requires paperwork in multiple government institutions, such as the Registro Nacional Público, Ministerio de Hacienda, and Ministerio de Salud [44, 45]. In addition, the Defensoría de los Habitantes revealed that SMEs face barriers in accessing credit due to the lack of traditional collateral and the disconnect between the messages of the Sistema de Banca para el Desarrollo (SBD) and the practices of financial institutions [46, 47, 48].

Table 1 shows the behavior of the information and communication technology sector over the last seven years, showing a mixed picture, with employment generation for the period of 5.41% and an average export record of US$ 3,962.5 million, under conditions such as limited access to financing and the impact of the COVID-19 pandemic; however, the sector has experienced growth, thanks to the search for sources of financing such as crowdfunding as a mechanism for innovation and momentum for emerging initiatives [49, 50, 51].

**Table 1**
**Costa Rica's information and communication technology (ICT) growth**

| Year | ICT jobs | Approximate annual growth (%) | Exports (USD million) | Growth (exports) (%) |
|---|---|---|---|---|
| 2018 | 45 | – | 2,800 | – |
| 2019 | 47 | 4.4 | 3,000 | 7.1 |
| 2020 | 49 | 4.3 | 3,300 | 10 |
| 2021 | 52 | 6.1 | 3,700 | 12.1 |
| 2022 | 55 | 5.8 | 4,100 | 10.8 |
| 2023 | 58 | 5.5 | 4,500 | 9.8 |
| 2024 | 61 | 5.2 | 4,900 | 8.9 |
| 2025 | 65 | 6.6 | 5,400 | 10.2 |

Bai, Quayson, and Sarkis [52], Lee et al. [53], and Rupeika-Apoga, Petrovska, and Bule [54] agree that during the pandemic period, the difficulties for the business sector were exacerbated, driving the need to digitize organizational processes to reduce bureaucratic procedures, with the technology-based sector in Costa Rica being one of those favored by the acceleration of digitization and the demand for technological services, which boosted job creation. Matus-López and Chaverri-Carvajal [55] emphasize the promotion of innovation processes in Costa Rica, through the national strategy called Costa Rica Creativa y Cultural 2030, whose purpose is to foster an ecosystem of creative SMEs to promote entrepreneurship, innovation, and collaboration capabilities in the sector, with the objective of this strategy being to close the business gaps that hinder the promotion of the *orange economy* in the country. However, there is evidence of successful cases in Costa Rica that should be documented, and the objective of this research is to identify and document them as a starting point toward a sustainable *orange economy* model.

Amado Mateus, Guzmán Rincón, and Cuero Acosta [3], Estrada et al. [56], and Spreen et al. [57] highlight that the growth of the *orange economy* in Latin America has been largely due to the initiatives promoted by the IDB within its development programs, but outside this activity, the processes in the region are slow and unattractive for the business sector since they do not show benefits to be obtained in this activity, being a fundamental piece to be considered for the entry into the 5.0 revolution. Therefore, this study seeks to contribute to the basic inputs to understand the importance of this model in the face of a new era.

## 3. Methodology

The study used a qualitative method as it produced the object under examination using the discovery of regularities and linkages between the components of the research [58, 59, 60, 61, 62]. Since it found the traits of the object of research related to the identification of the main characteristics for the achievement of business goals based on an *orange economy* strategy in the technology-based sector, it established a subcategory inside the exploratory approach allowing it to explain the benefits and impacts of the studied phenomenon [63, 64, 65, 66, 67, 68, 69]. Moreover, a subcategory of transversal or synchronic observation emerged because statistically evaluating the occurrences in line with the emergence of a picture during the data collection period looked interesting [70, 71]. Joshi and Kansil [72], Khanfar et al. [73], and Martínez-Fernández et al. [74] maintain the need to do more thorough research to understand the use and possible evolution of the *orange economy* in companies, the qualitative method of the technique that would allow deepening in this area.

First, a narrative and critical analysis of previously published material in the field of *orange economy* in the technology-based sector was done to provide a solid conceptual framework based on prior research [75, 76, 77, 78, 79]. The strategy used a logical line of thinking to structure the research proposal approach systematically and efficiently.

Under this aim, a bibliometric review of scientific publications between the years 2020 and 2025 was conducted by searching the Emerald, ScienceDirect, Scopus, and Web of Science electronic databases; the selected databases were selected based on strict scientific publication criteria, to ensure the quality and relevance of the contents connected with the phenomenon of the research. Moreover, the search was conducted in English and used specific search criteria like "*orange economy*," "Creative hub," and "Costa Rica." Thus, one bibliographic reference related to the focus of the study was selected (see Table 2).

**Table 2**
**Matrix of contrasting finding**

| Database | Search criteria | Quantity |
|---|---|---|
| Emerald, Science Direct, Scopus, and Web of Science | "Orange economy," + "Creative hub" + "Costa Rica" +"articles only"+ "English only" | 1 |

The case method is applied as a qualitative research technique based on the outcomes of Table 2 since it allows a deep knowledge of the events, entities, or phenomena [60], which makes it possible to identify the traits in the search process and perform a more exact systematic analysis of the phenomenon examined. As such, the case study looked at assets and research solutions grounded on a successful organizational strategy based on *the orange economy*. Then, throughout the data analysis phase, a documentary study of the salient features of the *orange economy* strategy used by the organization was conducted.

Thanks to the strength and stability of its business processes and strategic vision, the case study chosen matched *creative hubs* and *startups* since it was a technology-based sector in Costa Rica with, at the time, a successful and publicly recorded case of the implementation of an *orange economy* strategy that allowed it to achieve its business goals, allowing the use of the company's documented experience to conduct thorough research of its innovative approach. Finally, the acquired data were systematized to identify a general trend of an *orange economic* strategy as an input to be used by the next companies.

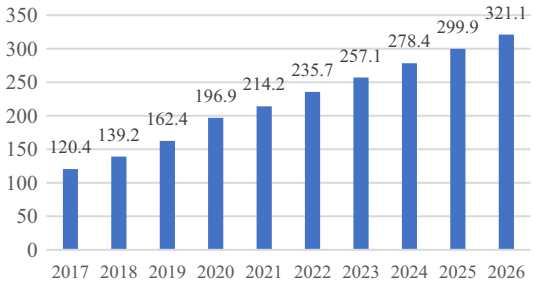
## 4. Results

After finishing the literature research, we moved on to the examination of a representative case study for the *orange economy* approach and an exploratory search.

Leveraging its rich cultural legacy, talented workforce, and supportive environment for startups and creative businesses, Vargas-Halabi and Yagüe-Perales [80] contend that Costa Rica has become a lively center for creativity and innovation in Latin America. As a main engine of economic growth, employment creation, and social development, the nation has been aggressively advocating its *orange economy*—creative and cultural sectors. The wide expansion and transformation of Costa Rica's *orange economy*, which spans sectors like creativity and intellectual labor, drive economic development and depend critically on technology-based companies. Promoting national and worldwide competitiveness, creating jobs, enhancing economic diversity, and supporting an innovation-led growth model all depend on companies now more than anything else. These technologies enable not just sophisticated technical services but also the manufacturing of artistic and cultural products with possible global market value [81].

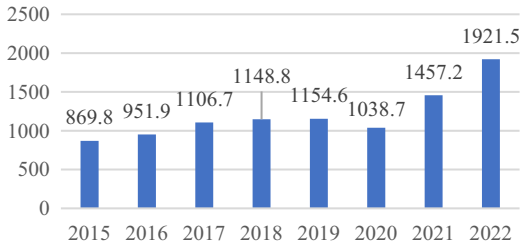
By bridging the gap with foreign markets using virtual expos, training courses, and innovation challenges, companies like Promotora de Comercio Exterior (PROCOMER) significantly strengthen local enterprises [82]. Being a profitable sector that directly affects results and accomplishments surrounding the overall economy, Figure 1 demonstrates the steady expansion and prognosis of the video gaming industry [83, 84].

**Figure 1**
**Global video games revenues ($ billions)**




However, several structural challenges hinder the complete realization of technology-based companies within the *orange economy*. Bureaucratic complexities in formalization processes, often involving cumbersome tasks like registration with multiple governmental bodies and obtaining land use permits, impede entrepreneurial agility [85]. This is particularly problematic for digital businesses where traditional requirements might not be applicable. Additionally, financial access poses ongoing difficulties, as creative startups are frequently compelled to self-finance due to conventional banking practices failing to address the sector's unique conditions, such as inconsistent revenue streams and lack of collateral assets [14]. Although alternative funding methods like *crowdfunding* are gaining traction, their widespread adoption remains limited. Figure 2 shows the economic contributions of technology-based companies, which exceeded $1,921.5 billion in exports in 2022; however, there is an absence of official recognition within Costa Rica's *orange economy* metrics [5, 6]. Aligning national definitions with those of the IDB, which considers technology-based companies integral to the *creative economy*, could support better policy coordination and exploit industry potential [86].

**Figure 2**
**Economic contribution to technology-based companies ($ billions)**




Further strengthening technology-based companies as a basic component of Costa Rica's *orange economy* depends on a coordinated effort. This requires collaboration among legislators, businesses, and inventors to turn current problems into opportunities, thereby enhancing competitiveness and accomplishing inclusive growth. Steps in the right direction include government efforts like digital transformation and educational programs under *creative hubs* and *startups* in Costa Rica, yet they must expand in breadth and integration to have a significant influence. Eliminating pointless obstacles by centralizing operations on digital platforms and changing virtual process requirements might help build a strong *orange economy*. Complete with case studies and examples, this is a comprehensive history of Costa Rican startups and creative hubs.

### 4.1. Creative hubs in Costa Rica

García-Lirios, Carreón-Guillén, and Sanchez-Sanchez [87] say Costa Rica's creative centers are hubs for innovation, resource sharing, and creative project creation; Soto Kiewit and Vienni Baptista [88] startups, creativity, and cultural expression advancement depend on these facilities.

#### *4.1.1. Important features of Costa Rican creative hubs*

1) One may find creative conference rooms, studios, and co-working areas in collaborative spaces.
2) They connect with industry experts, investors, and mentors for company owners via networking and mentoring.
3) Workshops and Training: They provide courses to progress expertise in disciplines like design, business, and technology.
4) Cultural Impact: They help to preserve and advance Costa Rican civilization.
5) Many of the centers stress sustainable techniques and social effects.

#### *4.1.2. Costa Rican creative hub examples*

##### *4.1.2.1. Impact Hub San José*

1) Description: Comprising a component of the Global Impact Hub network, this hub helps Costa Rican social entrepreneurs and creative businesses.
2) Activities: Accelerator programs, networking gatherings, and co-working areas abound.
3) Impact: It has helped several businesses in sectors such as digital media, ecotourism, and sustainable design get out.

##### *4.1.2.2. Centro de Innovación y Desarrollo (CID)*

1) Description: A center meant to encourage Costa Rican innovation and entrepreneurship.
2) Activities: It provides businesses access to training, mentorship, and finance.

3) Impact: Supporting digital and creative industries, new companies have stimulated the economy and created jobs.

*4.1.2.3. Espacio Virilla*
1) Description: An artistic and cultural expression encouraging an atmosphere created by design.
2) Events include art shows, cultural activities, and conferences.
3) Impact: It has become a crucial stage for regional artists and creatives to present their works.

## 4.2. Costa Rican creative economy startups

According to Mutira, Yazid, and Bastian [89], Sumarsid et al. [90], and Torres and Jasso [91], Costa Rica's startup ecosystem is blossoming with a growing number of creative and cultural sectors' innovative enterprises. By using technology, innovation, and Costa Rica's unique cultural attributes, these companies produce items and services that appeal to both local and foreign customers.

*4.2.1. Important features of Costa Rican startup hub*
1) Startups usually combine modern technologies with elements of old culture.
2) Many companies give sustainability—along with social and environmental concerns—a top priority.
3) Startups export original goods and services to international markets with global reach.
4) They may work with creative centers, academic institutions, and governmental agencies.

*4.2.2. Costa Rican startup examples*
*4.2.2.1. Simbiosis*
1) Description: A recently founded business creating sustainable design products from natural materials.
2) Impact: Globally, its ecologically aware attitude and imaginative designs have drawn interest.

*4.2.2.2. Agencia La Lupe*
1) Specialties for this creative company include digital marketing, design, and branding.
2) Impact: Working with reputable local and international companies, has encouraged Costa Rican innovation.

*4.2.2.3. Costa Rica film commission*
1) Though not a startup, this organization supports the growth of Costa Rica's film sector.
2) Impact: Using overseas film projects, has stimulated the local business and jobs.

*4.2.2.4. Tico Games*
1) Description: A Costa Rican culture-inspired video game production firm.
2) Impact: It has grown in popularity both domestically and abroad, demonstrating Costa Rican innovation in the gaming sector.

## 4.3. Examples of Costa Rican startups and creative hubs

*4.3.1. Case study 1: Impact Hub San José*
1) Background: Impact Hub San José is a member of an international network of innovative hubs that assist *startups* and social entrepreneurs.
2) Activities: Co-working spaces, networking events, and accelerator programs are available.
3) Impact: By helping more than 100 entrepreneurs, the center has promoted innovation and created employment in industries including sustainable design, digital media, and ecotourism.

*4.3.1.1. Key success factors*

Figure 3 shows the main common success factors for the *impact hub*.

**Figure 3**
**Impact Hub San José**

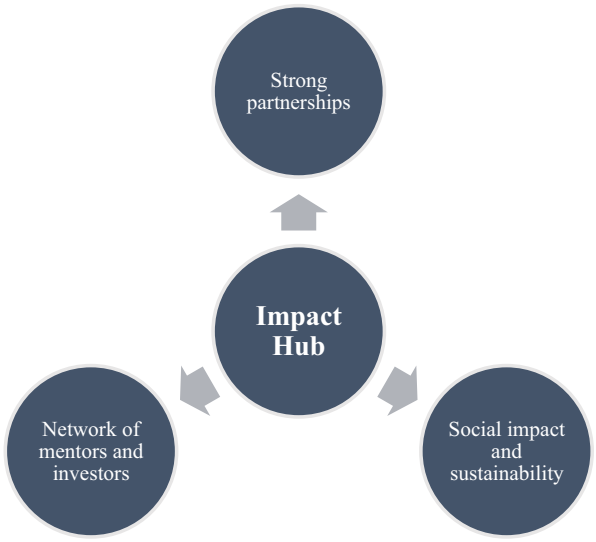



Figure 3 illustrates the three pillars that support effect hubs' strategy: (1) solid collaborations with public and private sector entities, (2) emphasis on sustainability and social effect, and (3) availability of a worldwide network of investors and mentors.

*4.3.2. Case study 2: Simbiosis*
1) Background: Simbiosis is a firm that uses natural materials to make sustainable design goods.
2) Activities: It creates accessories, furniture, and home décor influenced by the Costa Rican environment and culture.
3) Impact: Exporting goods to markets in North America and Europe, the firm has become well-known worldwide for its creative designs and environmentally conscious philosophy.

*4.3.2.1. Key success factors*

Figure 4 shows the main common success factors for Simbiosis.

The three pillars supporting the impact Simbiosis approach are shown in Figure 4: (1) a focus on cultural heritage and sustainability, (2) cooperation with regional designers and craftspeople, and (3) a robust web presence and e-commerce plan.

*4.3.3. Case Study 3: Tico Games*
1) Background: Tico Games is a video game production company that makes games with cultural references to Costa Rica.
2) Activities: It creates and releases games for desktop and mobile devices.
3) Impact: The studio has grown in popularity both domestically and abroad, demonstrating Costa Rican ingenuity in the video game sector.

*4.3.3.1. Key success factors*

Figure 5 shows the main common success factors for the Tico Games.

**Figure 4**
**Simbiosis**

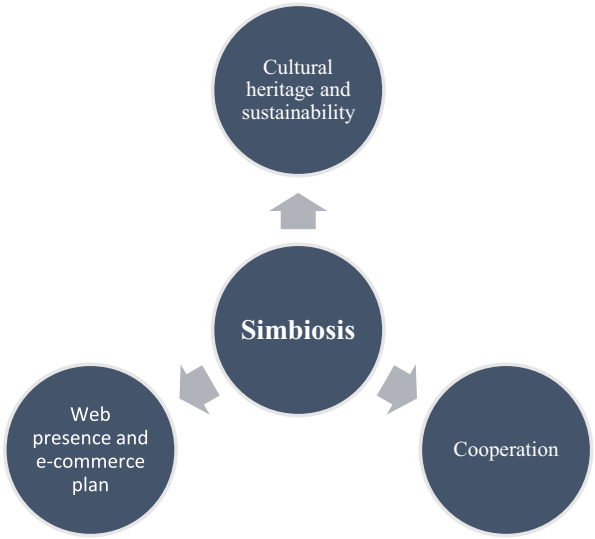



**Figure 5**
**Tico Games**

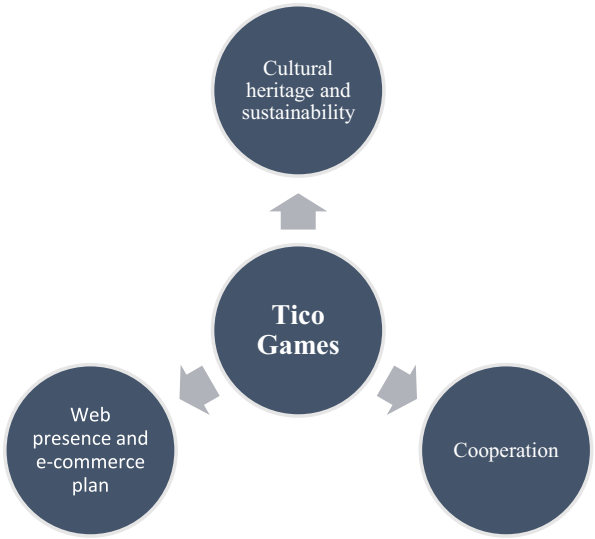



Figure 5 illustrates the three pillars that underpin the impact of the Tigo Games approach: (1) participation in international gaming events and competitions, (2) partnership with colleges and creative centers for talent development, and 3) unique cultural themes and narrative.

### 4.4. Challenges and opportunities

Table 3 shows the common challenges and opportunities faced by companies embarking on an *orange economy* strategy.

In conclusion, the model that promotes innovation, cultural expression, and economic growth, as well as the development of an ecosystem in the nation, helped Costa Rica position itself as the leader of the creative and cultural industries in Latin America. This was made possible by business models based on *creative centers* and *startups* in technology-based companies.

**Table 3**
**Challenges and opportunities**

| Challenges | Opportunities |
|---|---|
| • Limited financial resources are available to businesses in their early stages.<br>• More specialized training programs are required.<br>• Competition from more extensive international markets. | • Rising demand for cultural and creative goods worldwide.<br>• Possibility of making use of Costa Rica's abundant biodiversity and cultural legacy.<br>• Growing interest in socially conscious and sustainable companies. |

## 5. Discussion

In the current digital landscape, the *orange economy* has gained substantial significance through the fusion of innovative technologies that facilitate creativity and innovation. This economy spans diverse sectors like art, culture, technology, and research, where the intrinsic value of products and services is defined by their intellectual and creative essence. Technology has enabled the growth and diversification of these sectors by making the creation, dissemination, and worldwide consumption of cultural products more feasible [7]. Yet, transitioning modern society toward this model introduces both notable challenges and new prospects.

Among the foremost challenges highlighted by Amado Mateus, Guzmán Rincón, and Cuero Acosta [3] is the safeguarding of copyrights and intellectual property. In a digital realm rife with piracy and unauthorized sharing, platforms must enforce stringent measures to secure creative works and ensure creators receive deserved compensation. Another major issue, as outlined in Zirena-Bejarano and Choquecahuana-Valverde [92], is the digital divide. Not all creators have the technological means to craft and distribute their unique products, making the promotion of policies for equal access to technology vital. Additionally, finding sustainable avenues for monetization remains a crucial hurdle, as highlighted by Duan [93]. While platforms like streaming services and social media increase visibility, they do not always provide sufficient income for creators.

Despite these challenges, the digital era offers promising opportunities for the *orange economy*. Dionisio et al. [94] note that digital tools and platforms have amplified creative capacities widely—from design applications to crowdfunding services—thereby offering creators unprecedented resources to develop and fund their initiatives. Digitalization has also erased geographical boundaries, allowing cultural products to captivate global audiences, as per Elfaki and Ahmed [95]. This expansion not only broadens market reach but also enriches cultural diversity and exchange. Chi et al. [96] and Deák and Kumar [97] point to the convergence of fields such as technology, art, and science, which generate novel forms of expression and innovative products. This interdisciplinary constructive collaboration stands as a monumental opportunity for the *orange economy* within the digital era.

The study's findings highlight the crucial role that *startups* and *creative hubs* have played in the growth of Costa Rica's *orange economy*. In addition to encouraging creativity and invention, these areas and endeavors have made a substantial contribution to employment development, economic expansion, and the advancement of regional culture. The main conclusions and their ramifications are examined below.

The growth of creative ideas and cooperation is greatly aided by creative hubs like Espacio Virilla and Impact Hub San José. By offering tools, networking opportunities, and mentorship, these places help entrepreneurs get over typical obstacles including a lack of infrastructure and money. Costa Rica is positioned as a model in the area due to its emphasis on sustainability and social effect, which mirrors a worldwide trend toward more responsible corporate strategies.

There are still issues, however, such as the need for more funding for infrastructure and specialized training initiatives. Furthermore, these centers' long-term viability rests on their capacity to make money on their own and preserve strategic partnerships with both the public and commercial sectors.

The examined firms, including Simbiosis and Tico Games, demonstrate how local culture combined with creativity and technology can produce distinctive goods and services that have a global reach. These businesses have helped to preserve and advance Costa Rican cultural identity in addition to successfully differentiating themselves in cutthroat marketplaces.

The emphasis on sustainability, which has enabled these firms to draw in customers from across the world who are aware of their social and environmental effects, is a pertinent discovery. Access to venture financing, particularly in the early phases, continues to be a significant barrier to these businesses' expansion and scalability.

The growth of the *orange economy* has been greatly aided by the backing of the Costa Rican government and institutions like PROCOMER. Internationalization of innovative goods and services has been made easier by government regulations and export promotion initiatives. The innovation ecosystem has also been reinforced by partnerships among universities, creative centers, and entrepreneurs, which have produced a steady stream of talent and expertise.

To overcome obstacles like the shortage of funding and the need for more accommodating legislative frameworks that promote investment in creative industries, ecosystem players must coordinate more.

The study's findings demonstrate the *orange economy's* ability to propel Costa Rica's sustainable growth. This industry fosters innovation, creativity, and culture, which not only boosts the economy but also aids in social inclusion and cultural heritage preservation. Furthermore, Costa Rica's emphasis on sustainable practices is in line with the Sustainable Development Goals (SDGs) of the United Nations, especially those related to responsible production and consumption (SDG 12) and decent employment and economic development (SDG 8).

The *orange economy's* pivotal role in the digital age and advancement toward the 5.0 revolution cannot be overstated. While challenges persist, such as copyright violations and digital inequality, the opportunities posed are remarkable. By integrating advanced technologies, promoting globalized markets, and encouraging interdisciplinary collaborations, the *orange economy* can significantly contribute to sustainable development and enhance human well-being. Coordinated efforts between creators, businesses, and governmental bodies are essential to mitigating challenges and maximizing the transformative possibilities of this new era.

The conclusions of this research are limited in their generalizability since they concentrated on instances of Costa Rican *startups* and *creative hubs*. Future studies can compare the Costa Rican ecology with those of other Latin American nations or extend the examination to other parts of the nation. Furthermore, examining the long-term effects of governmental policies on the expansion of the *orange economy* and assessing the contribution of innovative technologies like artificial intelligence to the creative industries would be beneficial.

Given the circumstances, the study's conclusions highlight how crucial entrepreneurs and creative centers are to the growth of Costa Rica's *orange economy*. In addition to fostering creativity and innovation, these players have supported sustainability and local culture. Addressing issues like funding availability and the need for increased ecosystem actor collaboration is crucial to maximizing their effect. Costa Rica can establish itself as a regional leader in the *orange economy* and set an example for other developing nations if given the proper assistance.

## 6. Conclusions

For a technology-based company to be part of the *orange economy* in Costa Rica, it must be formally registered and dedicated to the development of video games. This is because the creation of video games is the only subsector currently supported by government programs and accounted for in the CSA.

## 6.1. Opportunities

The *orange economy* is key to the economic development of Latin America and the Caribbean, driven by innovation, creativity, and participation in the digital revolution. Costa Rica has taken significant steps to promote this economy, starting with the creation of the CSA in 2012 and the Política Nacional de Derechos Culturales (PNDC). These initiatives seek to foster innovation, as well as promote entrepreneurship and creative enterprises.

In addition, technology-based companies can benefit from general opportunities available to SMEs, such as public and private support networks, training and mentoring programs, accelerators, incubators, and innovative financing methods such as crowdfunding.

## 6.2. Challenges

One of the main challenges for SMEs in Costa Rica is the formalization process, which lacks a centralized administrative platform that allows for legal registration and formalization in a single procedure. Although some steps have been digitalized, many procedures are still face-to-face and cumbersome. For example, the land use permit is still mandatory, even for technology companies that operate virtually and do not require commercial premises.

Another major challenge is access to financing. Startups without an operating history cannot easily access loans, forcing entrepreneurs to rely on their capital to cover startup costs. Only well-positioned companies obtain financing, leaving out many initiatives with creative potential.

In addition, government support focuses exclusively on video game development, leaving aside other technology-based sectors such as software development and telecommunications, which have a significant share of exports and contribute substantially to the economy. Integrating these sectors could significantly increase the impact of the *orange economy*.

## 6.3. Recommendations

1) Centralize and digitize processes: It is recommended to create a centralized and fully digitized administrative system to streamline, reduce costs, and optimize the formalization process of SMEs.

2) Make requirements more flexible: Eliminate the land use permit requirement for technology companies that operate virtually, since they do not need physical facilities for their services.
3) Improve access to financing: Implement financing plans that include initial capital for creative enterprises, eliminating the barrier of two or three years of operation currently required to access credit.
4) Broaden government focus: Include all sectors of technology-based industries, not just video game development, in government support programs to maximize economic impact and foster innovation in various technological areas.

By implementing these recommendations, the development of the technology-based sector within the *orange economy* can be enhanced, boosting creativity, competitiveness, and sustainable economic growth in Costa Rica.

The findings from this study highlight a pivotal shift in strategic approaches concerning the *orange economy* within the digital era. These insights offer a framework for businesses that could significantly influence their strategic success by focusing on data-informed decision-making and appreciating the constructive collaboration between sustainability and technology in digital business contexts. The practical implications offer stakeholders a structured guide for crafting strategies that utilize technological advancements and promote sustainable practices.

From a theoretical standpoint, the results encourage further academic research, exploring how *orange economy* trends and challenges can be woven into business strategies and the importance of resilient stakeholders in an ever-evolving digital landscape. Since the field is relatively new and expansive, future research possibilities are abundant, promising a wide range of exploration into emerging trends and unexplored areas within this vibrant economic sector.

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## Ethical Statement

This study does not contain any studies with human or animal subjects performed by the author.

## Conflicts of Interest

The author declares that he has no conflict of interest in this work.

## Data Availability Statement

Data sharing does not apply to this article as no new data were created or analyzed in this study.

## Author Contribution Statement

**Gabriel Silva-Atencio:** Conceptualization, Methodology, Validation, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Supervision, Project administration.

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