

**Improving Alianza Verdes:
Promoting a local crypto currency designed to foster circular
economics and community engagement in Monteverde, Costa Rica.**



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Improving Alianza Verdes: Promoting a local crypto currency designed to foster circular economics and community engagement in Monteverde, Costa Rica

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ABSTRACT:

In the region of Monteverde, Costa Rica, Alianza Verdes implemented a local currency, Verdes, in January 2020 to foster a circular economy. The currency had initial success, however during our research period, Verdes had limited use. Our team was tasked with revitalizing the currency's use by creating educational resources. Our methods included surveying and interviewing Verdes users, interviewing local currency directors worldwide, and assessing Alianza Verdes's informational website. Through our research, we found an informational gap between Verdes users and the resources available to them. Our team provided improved educational resources such as: an informational website, video and infographic tutorials, and storefront information.

EXECUTIVE SUMMARY:

Monteverde, Costa Rica is a geographically limited area and has a small population of around 4,500 residents. During March of 2020 when the COVID-19 pandemic began to affect even these remote regions, travel restrictions were set to minimize the outbreak. However, ecotourism comprises a large majority of the Monteverde economy, and this travel restriction had negative impacts on the community. Many residents lost their jobs, businesses closed, and the region began to enter a recession. Proactive members within the community, including a combination of governmental and non-governmental entities, took several steps to address these issues including simple food distribution and mask supply distribution. Long term solutions were also introduced, such as implementing a local currency within the region to foster a circular economy, as well as help protect the region from future economic impacts. The local currency Verdes was launched and hosted on Cambiatus, a service that provides small communities around the globe with the technology to run a currency on a secure blockchain ledger.

Within the first few months, Verdes had over 2,000 members and was seemingly a success. Members could earn the currency through environmentally sustainable practices and use Verdes to save Colones. However, over the next year, the frequency and availability of Verdes transactions declined and the leaders of Alianza Verdes looked to our team to revitalize the currency. During our research period through January and February of 2022, tourism had almost fully returned and many of the educational resources available to teach members about Verdes had fallen out of date or were inadequate. Our team was tasked with discovering why use had dropped, as well as creating new educational material including a new website, tutorial videos, and infographics that could be used to help increase the frequency and availability of Verdes for the community.

A local currency, or alternative currency, is an example of an asset-based community development program that is typically circulated within geographically limited areas. The use of local currencies has been well documented to have considerable socioeconomic benefits for both the user and the community, including increased revenue for the users, and developing stronger community bonds. Local currencies have been around for hundreds of years, and generally act in the same fashion as fiat currencies. A user can list products or offers for sale which can be purchased using the local currency at an exchange rate set by the community or managing organization. There have been several successful local currencies in the past 30 years, such as the BerkShares located in Berkshire country of Massachusetts, which has circulated since 2005. Local Trade Partners is another, which is circulated in Arkansas and has been used since the recession of 2008. Both currencies work to support local business and are regarded by their respective communities as important tools. Based on this information, Verdes was implemented in Monteverde to keep money circulating in the region and increase community ties. However,

few resources were provided to the members of Verdes, only an incomplete website, and although the currency gained thousands of members in its first months of circulation, use rapidly declined over the next year.

Effective educational resources should consider several factors that affect the viewers experience and retention. Elements such as color scheme, as well as font and font size can influence the effectiveness of educational resources. This ties into creating consistent branding throughout different resources including websites, videos, and infographics, helping tie the learning experience together. It is also important to consider the time length of videos, or the time needed to read an infographic. The most effective learning tools present information efficiently making sure to be thorough, but concise.

The goal of our project was to increase the usage of Verdes by providing educational materials to help the Monteverde community members understand how to use it, as well as understanding the goals and benefits of the currency. Our project included three main objectives:

- 1. Gain applicable knowledge surrounding the Verdes ecosystem**
- 2. Learn successes and failures of prominent local currencies around the world**
- 3. Develop educational videos, infographics, and similar content to provide better information for Verdes users.**

We achieved these goals through 4 main methods:

- 1. Heuristic evaluation and subsequent redesign of the Verdes informational website**
- 2. Semi-structured interviews with Verdes users and local currency directors**
- 3. Surveying Verdes users**
- 4. Developing educational videos, infographics, and similar content to provide better information for Verdes users.**

The Verdes informational website, Verdes.earth, was intended to serve as a web page where users could learn about Verdes, including its mission and tutorials on how to use it. Our team evaluated it using Jakob Nielsen's 10 Heuristics for User Interface design. These heuristics serve as a set of guidelines to ensure the website is intuitive and feels familiar to a user when compared to industry standards. The website did not pass any of the heuristics and had to be redesigned. Our team designed the new website with the goal of creating a central hub for Verdes information. It contains educational videos and infographics developed by the team to reduce the technological barrier to use Verdes, as well as a video showing Verdes being used for

an in-person transaction and a comic strip about a Verdes monthly fair. In addition to these materials, there is information about Alianza Verdes, as well as the general goals and purpose of the currency.

The semi-structured interviews conducted by our team with Verdes users were used to learn about the main problems people in the community experienced while using Verdes. This helped find areas of the currency that needed improvement, as well as areas where the currency was succeeding. We coded our interviews to find common themes about the Verdes user experience. Our team also interviewed directors of other local currencies to discuss what worked for their currencies. Our team lacked economic expertise, so these interviews were critical for us to make effective recommendations to Alianza Verdes.

The survey developed by our team was designed to highlight the general sentiment of Verdes held by the community, as well as common issues and other demographic information that would help us design our educational content, including popular social media platforms within the community.

Our educational materials were designed to help guide the community members through the process of using Verdes, including using the Cambiatus platform to send and earn Verdes. We made tutorials for users to add a shortcut to the Verdes page on their smartphones. In addition to the infographics, we created a video demonstrating a real-life transaction using Verdes to pay for a cup of coffee at a local coffee shop that accepted Verdes. Finally, we made a comic strip demonstrating the Verdes monthly Feria, a community farmers market where users could spend their Verdes.

Confusion about Verdes frequently appeared while conducting research. With a poorly designed and currently expired website, members had no resources to learn about the currency effectively. The website did not meet the standards for website design and caused readability and information retention issues. The information gained from our interviews and survey found that confusion and poor user experience while paying with the currency were the most significant barriers keeping members from using Verdes. Users lacked knowledge of the several ways to gain Verdes; through environmentally sustainable actions, direct purchase of Verdes with Colones, and offering goods or services on the marketplace. Accessing and transferring Verdes from account to account was another barrier, with a sign-in process taking several minutes being a significant complaint. In addition, the currently defunct website Verdes.earth was the only informational hub for the Verdes currency, which lacked a comprehensive list of shops and artisans who would be willing to accept Verdes. Users had trouble finding ways to spend the currency even when available.

Independent sellers responded in interviews and survey responses that finding locations to buy raw materials with Verdes was difficult. They lacked purchase options, and thus quickly

accumulated Verdes. Many businesses that accepted Verdes adopted a partial payment system to circumvent some of these issues, offering between ten and twenty percent of their total bill to be paid in the currency.

We assembled information on managing and producing a successful local currency by conducting interviews with various local currency directors and recording their advice. Some gave insight towards management, one being that many projects fail with a volunteer-based system without determined and profiting advocates for these currencies. Another insight was towards physical and digital currencies, each with its own set of pros and cons. A digital system alone is not enough to ensure ease of use; users expressed issues accessing the marketplace, calling it “too complicated.”

The website designed by the Alianza Verdes failed our heuristic evaluation and was completely redesigned. The website's goal was to provide a central informational hub that contains all the information a Verdes user would need to get started with Verdes. A redesign helped eliminate several barriers of use by providing complete, in-depth tutorials for everything the user needs to know about Verdes. Our survey received 70 responses, finding openness to using Verdes as a modern implementation of their long-standing tradition of bartering between neighbors. Many community members who accumulated Verdes appreciated previous events held, such as the monthly ferias. Many members also expressed that using the Cambiatus platform was confusing and inconvenient. Those we interviewed were anxious about potentially losing their password or having to make new accounts.

After being redesigned by our team, the new Verdes website is ready to be hosted on the internet. Bluehost is a simple and cheap web hosting service, and our sponsor currently has a Bluehost membership, making it the most logical choice given the circumstances. Alianza Verdes was provided the WordPress files so they may make changes as needed. It is important for them to update the website when information becomes outdated. This website will serve as the informational hub for Verdes and should be updated as needed. To further the effectiveness of Verdes, we recommend the group use the social media accounts linked to the website, such as the Verdes Instagram page or WhatsApp group, where users can find consistent updates to the project and news about Verdes community events.

Verdes encounters the same issues as any currency, including supervision, regulation, inflation, and over-accumulation. Successful currencies require proper management. We recommend that Alianza Verdes or the next team of researchers, in their background research, thoroughly explore economic systems and the actions used to manipulate a currency. During our research period, Verdes was run by two volunteers frequently busy with other projects and full-time jobs. These individuals also had little experience with economics. Further research should

be conducted around economics in general, with recommendations made based on successful economic models applied to the Monteverde community.

With a close-knit community such as Monteverde, the most effective way to reach people is to talk to them. A significant majority of members surveyed and interviewed said they heard about Verdes through word of mouth, mainly through neighbors and friends. Other local currency directors often knew many people within their communities. The directors of Verdes already have connections such as these, and we recommend they take full advantage of them when promoting the currency. Their status within the community will allow them an easier time when approaching business owners about accepting the currency and when talking to community members about Verdes.

While going from business to business in person is the most engaging outreach method, it is not efficient for a large audience. Many in Monteverde often peruse social media, and therefore it is equally as essential to take advantage of the reach online posting can have. Though Alianza Verdes does have a branded Instagram page, there are many other popular social media platforms that are not being utilized. We recommend that Alianza Verdes create branded social media accounts through Facebook and YouTube to help expand their reach in the community. This will increase visibility for Verdes and the businesses that accept it alike, giving users a valuable and engaging way to interact with and learn about Verdes.

While conducting interviews and surveys within the Monteverde community, our team discovered that there was a lack of informational material available to the users, leading to misunderstanding and unfamiliarity with the workings of the platform. For this reason, we encourage Alianza Verdes to take full advantage of the resources we have developed. Sharing of the infographic material, videos, web-comic, username sticker templates, and, most notably, the website is expected to bridge a large informational gap and lead to increased engagement and understanding of the platform.

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CHAPTER 1: INTRODUCTION

To help combat the effects of the COVID-19 pandemic on Monteverde's ecotourism-dependent economy, Alianza Verdes, a committee based in the region, developed a community-based alternative cryptocurrency called Verdes. Verdes was designed to help the community by providing a local currency for local businesses and small merchants in Monteverde. Verdes can be purchased with Colones, Costa Rica's national currency, or can be earned in a number of ways that promote environmentally sustainable behavior. The main issue Verdes is currently tackling is its low usage. Although there are many members and over 2000 accounts, the currency cannot be used to pay for many essential items or services. Only eight known stores accept Verdes, and the majority accept only partial payment in Verdes. These stores do not provide the variety or scale of products and services needed for a currency to thrive. Currently, Verdes users lack significant knowledge about what it is, how it is used, or why it is beneficial. Due to this, our project sponsors have asked our team to gather knowledge surrounding the Verdes ecosystem, learn from the successes and failures of prominent local currencies around the world, and develop educational content that will be used to inform their community about the benefits and proper use of Verdes in hopes of increasing the frequency of use.

CHAPTER 2: BACKGROUND

2.1: COVID-19 PANDEMIC: EFFECTS ON MONTEVERDE

Monteverde's stunning ecosystems and wildlife brings in 250,000 tourists a year, making ecotourism one of Monteverde's most prominent economic drivers (Shah, 2020). However, in the past year, Costa Rica has suffered over half a million cases of COVID-19, with seven thousand deaths. This large loss of life prompted the country to close its borders, which aligned with other countries' policies at the time. This decision, while necessary to protect public health, hurt Costa Rica economically. Hotels, tour guides, and restaurants were subjected to diminished profits, with tourists and locals alike voicing worries on a return to normalcy; both parties were fearful of contracting COVID-19 from the other. The region has claimed some government support, with applicants receiving around a third to a half of their average salaries.

The period of diminished tourism and low incomes shed light on the region's dependence on tourism, prompting the community and local leaders to support their neighbors, and build systems that may help prevent such hardships in the future. Local hardware stores have been drained of their seeds and gardening supplies as local agriculture boomed, with more extensive organic gardens selling their crops to their neighbors. There has been a significant push to keep money and resources circulating inside Monteverde. New enterprises have been springing up to lend their aid (Shah, 2020). Local currencies, such as Verdes have been introduced to solidify the idea of a circular, local economy.

2.2: LOCAL CURRENCY

A local currency, or alternative currency, is an example of an asset-based community development program that is typically circulated within geographically limited areas. Communities create and circulate this currency as a complementary facilitator of exchange to their own personal money system (Kwon et al. 2019). The creation and use of local currencies have been well documented to have considerable socioeconomic benefits for users. They can be considered one of the most effective tools local communities hold to handle the globalization of capitalism and hyper-mobility of money (Kwon et al. 2019). Local currencies all function similarly, where a local association is formed whose members list goods or services in exchange for units of the local currency. (Williams, 1996). Users decide what they wish to trade, the amount they wish to trade, and with whom they wish to trade. Currencies, as a mechanism, all function the same, acting to enable an exchange of value between two parties without exchanging physical items (Cohen, 2017). Local currencies can hold value compared to a traditional government-backed currency as they focus on the velocity of community-based transactions amongst peers and local businesses. This works to create a circular economy where

wealth is accumulated and distributed throughout the community, rather than slowly flowing to outside corporations or investors located outside of the region (Cohen, 2017).

By participating in a local currency program, users can also earn intrinsic rewards such as respect or increased self-esteem, or extrinsic rewards of physical goods or money in exchange for their tangible and intangible goods and services. These are exchanges not available in the general market (Kwon et al. 2019). Local currencies have been implemented around the globe in many forms: paper money, vouchers, digital credit, or even verbal promises. Local currencies then act to increase the variety of possible exchange within their region. They also promote social capital such as goodwill, trust, and reciprocity through a cohesive group identity (Kwon et al. 2019). Previous research also suggests that local currencies play an essential role in sustainable community development and improving residents' quality of life.

2.2.1: SUCCESSFUL LOCAL CURRENCIES

One example of a successful local currency is BerkShares. BerkShares is a printed paper complementary currency utilized in the Berkshire County of Massachusetts in the United States. It was implemented in 2005 with the primary focus of supporting local and independent businesses by keeping wealth circulated within the community (Cocheo, 2016). This is expected to maintain economic independence from tourism seasons as well as have environmental and social benefits to the community. Matti & Zhou analyzed the economic impacts of BerkShares, focusing on three primary factors: GDP per capita, unemployment rate, and presence of local businesses (Matti & Zhou, 2021). This local currency is of notable worth due to its lifespan and economic-independence mission. Unlike many other local currencies, BerkShares has been in circulation long enough for its long-term effects to be analyzed confidently. Due to its longstanding status, BerkShares can be utilized as a case study to reflect community response and the economic impacts of local currency systems.

Methods used by BerkShares to remain in circulation include education, funding, reach, and adjusting to demand ("BerkShares bylaws", 2019). The BerkShares community educates citizens through social media, newspaper outlets, and detailed FAQs on their website. This keeps information clear on obtaining and using the currency from both a business and customer standpoint. They maintain funding by charging membership fees to those interested in leadership roles, and as a registered non-profit, BerkShares avoids federal tax ("BerkShares bylaws", 2019). They have expanded their reach by collaborating with nearby businesses to accept and distribute their currency ("BerkShares directory", 2021). Having established many connections with neighboring businesses and service providers, BerkShares is able to have a variety of options for its users, making the currency just as valuable as cash within the region. Additionally, BerkShares has very effectively adjusted to demand to stay afloat. For the first year of its release,

a single BerkShare could be purchased for 90 cents. This is an effective 10% discount compared to the effective 5% discount used at the time of research (Cocheo, 2016). This model was adjusted when the BerkShares committee learned of the strain this put on businesses; those with outside distributors needed to cash in their earned BerkShares for traditional payments to keep their businesses afloat. Therefore, these local businesses would lose 10% of their profits when paid in BerkShares. This adjustment was made on behalf of businesses accepting the BerkShare payment, adjusting the cost of a BerkShare from 90 cents to 95 cents (Matti & Zhou, 2021). BerkShares is also complying with customer demand by allowing the option of committee membership and a transition to include a complimentary online medium in March 2022 (“About BerkShares”, 2021). This ability to conform to the community’s interests and needs, having an extensive reach, maintaining steady funding, and supplying educational resources has allowed BerkShares to sustain itself for over 15 years (Matti & Zhou, 2021). Verdes can improve and grow within the Monteverde community by following their example.

In addition to the example of the BerkShares, there are also hundreds of other local currencies based around the world. Several other local currencies share many of the same organizational structures and resiliencies, such as Local Trade Partners, based in Lafayette, Arkansas; BizX, based in Belleview, Washington; and Ithaca Hours, based in Ithaca, New York. These currencies possess diverse perspectives and beneficial qualities which can be used as an example to improve marketing, usability, and community participation (“BerkShares directory”, 2021). Additionally, the impact and success of a community currency are highly dependent on the community itself; their drive, how they use the currency, and public response are all essential factors. By gathering information and suggestions from a large pool of local currencies, Verdes will have a higher chance of success.

2.3: ENLACE MONTEVERDE

COVID-19 created broad impacts on the community of Monteverde, including a deep economic recession caused by Monteverde’s heavy reliance on ecotourism. Ecotourism accounts for well over half of the region's income. A non-governmental umbrella organization, Enlace, was created to respond to these issues through community outreach programs with the mission statement, “Faced with the crisis, we develop our community, organization, and strengthen the best human values.” This group was a pop-up organization designed to create self-sufficient entities that could help the community well into the future. Its iteration was never permanent. Rather it looked to create several independent organizations that would live after Enlace's dissolution, such as Alianza Verdes, the committee in charge of managing Verdes.

To address the economic and social impacts of COVID-19, Enlace first responded with food collection, food delivery, and mask supply. These steps were the first in alleviating the

pressing issues, while a sub-committee on the circular economy was formed to deal with the recession. This committee developed the idea for Verdes, a local currency that could work to facilitate exchanges and foster a circular economy within the region of Monteverde. Alianza Verdes's goals include reactivating Monteverde's local economy, promoting community solidarity and inclusion, and decreasing dependence on tourism. Enlace chose to implement Verdes through Cambiatus, an open-source platform that hosts social currencies on Blockchain, with the goal of empowering the creation of new organizations through social currencies on Blockchain.

2.3.1: CAMBIATUS

Local currency is not a new concept and has been implemented in various methods around the globe. Local currencies can take the form of paper money, tokens, or Blockchain, as Verdes is. However, each form requires infrastructure to run smoothly. Blockchain currency has many benefits, but just as paper money requires printing, storage, and distribution, using Blockchain technology for currency requires hosting servers and software development. One limiting factor in Enlace's Sub-Committee on Circular Economies efforts is funding. Due to this, the Sub-Committee on Circular economies opted to forgo the creation and hosting of Verdes, outsourcing the job to Cambiatus. Cambiatus provides a simple solution for those looking to form their own local currency. Anyone can apply, and Cambiatus absorbs a large portion of the back-end work and expertise needed to implement a successful Blockchain currency.

Several benefits of Cambiatus' platform influenced Enlace's choice of hosting. Due to Cambiatus hosting communities under 500 members for free, it had no initial cost. For a committee with limited funding, Cambiatus was a great tool. Initially, The Sub-Committee on Circular Economies predicted this would provide time for growth and revision. However, within a short period, Verdes membership surpassed this paywall, forcing Enlace to look towards outside funding and alternative methods of generating funds to pay the monthly hosting fee.

Free initial hosting was not the only consideration made in favor of Verdes' Blockchain implementation. Blockchain currencies have many benefits, mainly security. Cambiatus is also known for its high-speed, low-cost blockchain technology (Andrade et al., 2021).

2.4: WEBSITE DESIGN EVALUATION

When evaluating the user experience of a given application, we can use Jakob Nielsen's 10 Usability Heuristics for User Interface Design (Nielsen, 1994) as a set of guidelines to ensure a well-designed system. The ten heuristics include "Visibility of System Status", "Match Between System and the Real World", "User Control and Freedom", "Consistency and Standards", "Error Prevention", "Recognition Rather than Recall", "Flexibility and Efficiency of Use", "Aesthetic and Minimalist Design", "Help Users Recognize, Diagnose, and Recover from Errors", and "Help and Documentation" (Nielsen, 1994). They were developed with the goal of making the internet easier to use by offering a way for front-end developers to improve their user interface quickly and cheaply. If a website follows the heuristics, the user will be able to understand what is happening with the system they are using, as well as easily diagnose and recover from errors or mistakes. It is crucial for a website to be developed with these heuristics in mind to create an experience that feels up to standard with other websites the user has experienced.

2.5: STRATEGIES FOR THE DEVELOPMENT OF EDUCATIONAL MATERIALS

Our predecessor project conducted surveys with residents to gather insight on how the community interacted with the currency. They found that although the program had grown dramatically, there was a "significant lack of public knowledge" regarding the usage of Verdes on the Cambiatus platform (Andrade et al, 2021). Although many users signed up initially, few people in the community knew of Verdes or how to use it effectively.

Relevant guidelines for the development of educational tools for this project include the development of infographics and the development of educational videos. To develop the most effective and quality informational material, comprehensive and reliable directions are important.

2.5.1: EFFECTIVE STRATEGIES FOR CREATING EDUCATIONAL VIDEO CONTENT

The resource used to help guide this team into creating valuable educational videos comes from a study of educational videos on college undergraduates. They focused on three essential elements of improving educational videos: how to manage the cognitive load of the material, how to maximize engagement, and how to promote active learning from the video (Brame, 2016). These three factors are a significant consideration in creating educational video content.

An easy and important aspect to be considered is the length of the material; A study on educational videos found that students were two times more likely to watch an educational video if it were less than 6 minutes compared to a video of 9-12 minutes in length. Furthermore, they

were five times more likely to watch a video if it were 6 minutes or less compared to a video 12-40 minutes in length (Brame, 2016). Due to this, it may be beneficial to make videos as short as possible to encourage participation (Knott, 2021). As the article eloquently states, “if they don’t watch them, they can’t learn from them” (Brame, 2016).

While analyzing the elements involving student engagement and active learning, surveys conducted at the end of the course revealed that students felt more engaged in the content when there was a conversational tone and excitement from the speaker (Knott, 2021). This tactic is called the personalization principle, and it includes speaking quickly and with enthusiasm about the desired topic to engage the watcher. This is one tactic that the Verdes team can use to keep our listeners focused to best inform them on how to use Verdes and retain the informational content (Brame, 2016).

When creating educational videos, the different cognitive pathways for information must be considered. There are two cognitive pathways: visual and auditory. The visual pathway is for processing visual information, whereas the auditory pathway is for processing verbal information. These two pathways work in tandem when watching a video containing both visual and auditory information. Either of these pathways can be overwhelming and stunt the viewer’s ability to process and retain information. It is crucial to develop videos properly and balance between auditory and visual information so as not to overwhelm either pathway (Brame, 2016).

Matching modality is a tactic used by content creators to match information to a certain pathway to increase the amount of material retained. Different pathways can process certain information easier (Brame, 2016). For example, if you are trying to describe a rainbow, a visual cue may be processed easier and quicker by the brain than a verbal description. Another tactic used to assist a viewer is signaling. This includes visual cues across the screen to direct the subject’s viewpoint to important areas on the screen (“Ultimate infographic design guide”, n.d.). This can be done using bolding, arrows, and bright colors that draw the eye.

2.5.2: EFFECTIVE STRATEGIES FOR CREATING INFOGRAPHIC MATERIAL

Similar to developing effective video content, infographics utilize the visual cognitive pathway to catch attention and help the reader retain information. They make use of different fonts, font sizes, color themes, and icons as signaling to direct the reader's attention (Brame, 2016).

As well as utilizing the visual techniques described for creating educational videos, many guidelines are specific to infographics. Since infographics have limited space, it is essential to be spatially efficient and develop a focused purpose for the flier (“Ultimate infographic design guide”, n.d.). According to the WPI-approved guidelines, “the layout should reflect the theme and enhance communication of it” (“Ultimate infographic design guide”, n.d.). Everything on an

infographic must be purposeful. Most infographics should start with a sketch, allowing the designer to easily play with the design and placement of information (Beegel, 2014). When further developing the infographic, using brand guidelines, as well as consistent fonts and color pallets, are essential to design an effective infographic (Beegel, 2014). Specific advice given for infographics include using two numbers in the title for impact, using a maximum of three fonts, using photography in a consistent style, using 2-3 colors with an occasional accent, and leaving plenty of negative space (“Ultimate infographic design guide”, n.d.). These all assist with impact and visual aesthetics to the reader.

2.6: BACKGROUND CONCLUSION

Monteverde is largely dependent on ecotourism, and the community is looking towards a future with less reliance on outside investment from foreigners. Committees such as Enlace were created to develop plans of local investment as well as create tools that will bring the community back to its roots as an autonomous region. By learning about the region’s use of Verdes over the past year, researching other local currencies around the world, and creating educational videos and other forms of content, we will bridge the informational gap between the community and Verdes’ future success.

CHAPTER 3.0: METHODS

Local currencies can foster community and economic benefits within their geographic region. However, the currency must be trusted and used for these benefits to be tangible. The project's objectives could be consolidated into one main goal: to increase the use frequency of Verdes. To achieve this goal, the first objective of our project was to gain knowledge about why people were and were not using Verdes. Then, to collect information from prominent directors of local currencies around the world specific to their successes and failures and finally, to create and update tools to foster trust and educate members on use. By addressing these objectives, the project developed a range of information and user data, which, once assessed, was used to suggest changes and tools pertinent to Verdes.

Objectives:

1. **Gain applicable knowledge surrounding the Verdes ecosystem**
2. **Learn successes and failures of prominent local currencies around the world**
3. **Develop educational videos, infographics, and similar content to provide better information for Verdes users.**

3.1: GAIN APPLICABLE KNOWLEDGE SURROUNDING THE VERDES ECOSYSTEM

3.1.1: EVALUATION OF WEB RESOURCES THROUGH NEILSON'S 10 USABILITY HEURISTICS

The previous website for the Verdes project, Verdes.earth, has received criticism from the community for being poorly designed. Our team used Nielsen's 10 Usability Heuristics for User Interface Design (Nielsen, 1994) to evaluate the previous Verdes website to find areas what it did well and where it fell short. We used these heuristics when designing the new website for the Verdes project to ensure our website excels in terms of its user experience. Our goal was to create an intuitive, easy-to-use, and easily accessible educational Verdes resource hub for the Monteverde community. Additionally, Verdes.earth lacked visibility on search engines, making our redesigned website search-accessible will allow it to circulate easier within the community.

To perform the evaluation, we iterated through all the website's pages and marked each heuristic with a pass, failure, or not applicable. A failure on a heuristic meant it was either completely absent or was far from meeting expectations. A pass meant the heuristic is implemented in a manner that met all standards. A not applicable grade meant that the heuristic covered an aspect that was not required by the nature of the website. Any heuristic that failed needed to be considered when redesigning the website. A heuristic receiving a pass was considered for reuse when redesigning the website.

Heuristic	Definition
1. Visibility of System Status	The website should keep users informed about what is happening in the system, clearly displaying what section of the website they are on.
2. Match Between System and Real World	The website should use words, phrases, and concepts that are familiar to its target audience.
3. User Control and Freedom	Users should be able to undo and cancel actions.
4. Consistency and Standards	The website’s navigation and informational layout should feel similar to industry-standard websites.
5. Error Prevention	Error-prone conditions should be eliminated, and mistakes should be visible and correctible.
6. Recognition Rather than Recall	The user should not have to recall actionable elements from one part of the website to another. They should be easily visible and retrievable.
7. Flexibility and Efficiency of Use	Shortcuts should be provided for advanced users to use the system more fluently—not necessarily required in this case.
8. Aesthetic and Minimalist Design	Websites should not contain irrelevant information. Images and text should be adequately spaced, and there should not be an overabundance of information in any given section of a page.
9. Error Recognition and Recovery	Errors should have a visual representation to communicate their existence clearly.
10. Help and Documentation	The website should contain information on how to use it—not necessarily required for an informational website.

Table 1: Jakob Nielsen’s 10 Usability Heuristics (Nielsen, 1994)

Table 1 displays Jakob Nielsen’s 10 Usability Heuristics and brief descriptions of their qualifications.

3.1.2: WEBSITE DESIGN

The website design process can be effectively broken into three main stages: gathering requirements, wireframing, and implementation.

The first step we took in our website design was to gather a list of requirements for the website. This included information in the form of text, infographics, videos, pictures, and links for the user. It is essential to know exactly what the website needs to plan our later design stages around them. We compiled a list of requirements from the feedback received from our surveys and interviews. It was important to keep goals at a high level at this stage. We wanted the general ground rules up-front and would dive into the specifics during the wireframing stage (Lopuck, 2012). The information-gathering stage is about determining the end goals of the website and is imperative for accurately fulfilling the client's needs.

To effectively design our website's layout, we used a technique called wireframing to map our initial ideas and decide on a layout for the website before the actual design process. A wireframe is a detailed diagram of a single webpage and can be combined with others to map out a website (Lopuck, 2012). We used the software Balsamiq Wireframes for our wireframing process, as they have an array of powerful and intuitive tools with templates to expedite the process. At this stage, we focused on adding mid-level details, such as the organization and labeling of sections on the pages, as well as putting placeholders for images and other media. This gave us a clear path to follow when completing the last step of implementing the website.

For our website's implementation, we designed a WordPress website, while using the hosting service, Bluehost, to make it available on the internet. WordPress is a powerful but easy-to-use website building tool, and it is simple enough that team members with little or no experience in web design can use it. The Verdes committee has experience with WordPress and will be able to edit and maintain the website after our project's conclusion. WordPress also offers advanced features that team members with more experience in web design will utilize.

3.1.3: IRB ETHICS FOR HUMAN RESEARCH

Safety and protection for respondents and their information was non-negotiable. Our team acted in a manner that did not violate the rights of any human participants to the best of our ability. An IRB (Institutional Review Board) proposal acted to further define our team's mission statement concerning work involving human subjects, such as interviews or surveys. This proposal was submitted to the WPI Institutional Review Board prior to conducting our research and contained the details of our study. This included our expected study population, our study methods, as well as an informed consent form provided in their preferred language, which was used to walk interviewees through our study's purpose. This consent form also stated their rights as human participants. While conducting our interviews, all but one participant gave full consent

to record, transcribe, and include their responses and names in our final report. Although our human research involved minimal to no risk, participant safety is paramount in any study. Before any research was conducted, our proposal was accepted by the Institutional Review Board.

3.1.4: SEMI-STRUCTURED INTERVIEWS WITH VERDES USERS

The Cambiatus marketplace, Verdes.cambiatus.io, is the site to buy and sell goods and services with Verdes. The marketplace, however, had drawn criticism from its users. With that in mind, the marketplace users, both sellers and buyers, were interviewed to gauge what features would improve their marketplace experience.

With Alianza Verdes working with local producers, more communication was needed between the community it supports.

To get a more in-depth look at the desires of this community, our team conducted semi-structured interviews to gauge what users liked and disliked about Verdes. “In a semi-structured interview, the interview is sufficiently structured to address specific dimensions of your research question while also leaving space for participants to offer new meanings to the topic of study... While conducting the interview, you may prompt the participant, rephrase questions, and make changes according to the interview (Galetta, 2013, pp. 1-2) (Galetta, 2013, p. 75).

These semi-structured interviews were neutral, keeping personal biases, conscious or otherwise, out of the interview questions to receive genuine user feedback. The interviewer facilitated the conversation and encouraged the interviewee. If the participant was vague in their answer, the interviewer prompted them to restate or reflect on their answer (Paris, 2007).

In the 2020-2021 Verdes IQP Project interviews, users expressed suggestions for the marketplace site that had not yet been implemented, such as categories to quickly narrow down between products, such as food versus clothing (Andrade et al., 2021). By asking questions related to these changes in our interview, the team was able to gauge whether these changes were still desired by the users and prioritize the more desired features over ones suggested less.

The interviews were conducted in public spaces, such as coffee shops or local businesses. First, a consent script was read to the interviewee prior to the discussion. One team member observed the interview, taking notes. This team member was also responsible for recording an audio recording of the entire interview, which was later transcribed. The second team member led the interview, following the interview guides in their preferred language provided in Appendix C and Appendix D. This interview guide was translated into English and Spanish, allowing our team to increase the available population for our study. Language preference was determined prior to the interview through online communication. The interview was finished by asking the interviewee for other potential community members willing to be interviewed. This

method, called snowball sampling, built a tree network from each interview conducted and is considered an effective technique to access a limited population (Browne, 2002).

3.1.5: INTERVIEW LOCAL CURRENCY DIRECTORS

Due to Alianza Verdes's small budget and recent establishment, the leaders had limited time to experiment with changes, events, or promotions. These were actions that could have a positive, measurable effect on the use frequency of Verdes. However, local currencies themselves are not a new concept and have been around for decades. Around the world, hundreds of local currencies have had years to experiment with the directive to promote their currency. BerkShares, for example, has been in circulation since 2005, giving them over fifteen years to learn what actions have positive and negative effects on their currency (Matti & Zhou, 2021).

To gather information on these currencies, our project conducted online interviews with directors and employees who had worked with local currencies. By gathering this information, Alianza Verdes, creators of a younger currency, could gain valuable knowledge on the types of promotions that would benefit the currency. This information can only be learned from trial and error. Alianza Verdes lacked experience, making this information extremely valuable for Verdes' future.

The first step in this process was identifying local currencies that shared direct qualities with Verdes, such as facilitating barter and focusing on environmental sustainability. Another quality to focus on when choosing local currencies to vet was longevity. Alianza Verdes implemented Verdes to alleviate economic issues due to the COVID-19 pandemic; however, its long-term goals include fostering independence from ecotourism. By interviewing directors of local currencies that had been in circulation for years, actions and ideas that promote longevity could be identified and suggested for use in Monteverde.

Depending on availability, these interviews took place online through video chat (Zoom, Skype, Teams) or by phone. The interviews lasted roughly 30 minutes, focusing on the structure and promotions these directors implemented in their communities. The interview guide also focused on both successes and failures, as it was essential to identify actions to avoid, specifically if they had a detrimental effect on community outlook or use frequency.

3.1.6: SURVEY VERDES USERS

As a new currency, Verdes has only been implemented in the Monteverde region for a year. Due to this, obtaining information from members of the community was vital in developing strategies around informing Monteverde residents about Verdes effectively. To move forward with our project, a survey was implemented and sent to Verdes members to develop an understanding of their knowledge about Verdes, the blockchain technology, the benefits a local currency could bring, and determining popular social media platforms in the region. We were also interested in determining how effective learning of Verdes' strengths related to the frequency of use. If this information was accurately surveyed, the best platform to inform users could be developed (social media, website, physical flyers), including the most relevant information users were missing. Together these could work to create a more educated public view on Verdes, with the goal of increasing total usage by combating confusion and mistrust.

The first step in developing an effective survey was assessing the target population (Thayer-Hart et al., 2010). Before new members could be reached and informed, the current users needed to be addressed and supported to help increase the frequency of use. Verdes users were chosen as the population for this survey, which could be broadly reached through mass email, as all Verdes users submit an email address within the application process. Timing was a crucial step in survey planning (Thayer-Hart et al., 2010). Due to location and accessibility, the survey was conducted during the four weeks our team was present in the Monteverde region. Because this time was limited, the survey was largely developed prior to travel, with all survey materials and logistics planned. This allowed our team to fully optimize the four weeks when we had physical access to the population.

Developing questions for the survey was a vital step, as there is no directly measurable way to assess survey questions (Thayer-Hart et al., 2010). Due to this, it was essential to keep the survey's goal in mind while also formulating questions with consideration of a respondent's preferences (Thayer-Hart et al., 2010). This was especially true for our survey, as it was written in English primarily, then translated into Spanish, the primary language of Costa Rica. Because of the language barrier, it was essential to continually reassess our survey questions both in English and Spanish, as well as test the survey on bilingual respondents prior to questioning the final population. This allowed respondents the best opportunity to provide accurate and useful information, which is paramount for a survey.

Effective question structure is an abstract process. It is based on phrasing questions that are easily understood with a single clause. Question type was also an important variable to consider in effective survey creation. There are two forms of questions: closed questions and open questions. Closed questions provide limited acceptable responses, while open questions allow respondents to answer in their own words (Thayer-Hart et al., 2010). While creating the

survey, a mix of open and closed response questions were used to optimize data collection and survey flow. Closed questions contained limited but fully encompassing responses, including ranking scales. Open questions were used to collect more abstract user information that we could not have predicted or had a wide variety of possible responses.

Once the surveys had been completed and collected, statistical analysis of the data was done via Qualtrics to prepare relevant graphical content. This content was used to gather information leading to more frequent use, as well as the most effective manner to present this information to users.

3.2: DEVELOP EDUCATIONAL CONTENT

To accomplish our project's goal of increasing usage of Verdes, the lack of easily accessible information surrounding the currency was highlighted as a primary barrier keeping members from using the platform. By determining the most relevant information Verdes users were missing and creating different resources, we hoped to accurately educate the largest possible number of Verdes members to increase usage. This information was determined through cross-analysis of collected data in Section 3.1 and then formatted into respective media forms: educational video tutorials and infographics.

3.2.1: CREATION OF VERDES EDUCATION VIDEOS

One of the baselines in the creation of an educational video is to understand how well the audience will absorb the material. Once understood, the creators must take every action possible in the design phase to ensure the video will contain the desired content, is easy to interpret, and has a high retention rate (Knott, 2021).

To determine how to educate the viewer best, the Elizabeth Brame researched the brain's processing of information and applied it to educational videos in an NCBI study. Two important concepts were cognitive load and cognitive pathways (Brame, 2016).

Cognitive load is related to the amount and complexity of information presented to the viewer in the allotted time (Brame, 2016). As content creators, our goal was to minimize extraneous cognitive load. Extraneous cognitive load is unnecessary and potentially distracting information which confuses the viewer while trying to understand the content (Brame, 2016). To get viewers to understand Verdes, it was important that the content was relevant and to the point.

To gather the information we needed to convey, our team interpreted survey and interview results to determine what type of information the community needed to be presented about Verdes. Based on these findings, the core information of our deliverables became clear, and we assessed which format would best communicate the information.

To create our informative videos, there were some supplies that the team had to obtain. The many tools that go into quality video making include a camera, audio recording equipment, a script, proper lighting, and editing.

Before shooting the video, the team had to develop a purpose for each educational video, practicing segmenting of topics. Once the team selected the topic for each video, we brainstormed by creating and adjusting storyboards to our liking. Mock clips were shot to get an idea of how the video would look and feel without going into a full stage of development. Once the team was confident in the video's concept and script, we were able to record the necessary shots.

3.2.2: CREATION OF VERDES EDUCATIONAL INFOGRAPHICS

The creation of infographic material was chosen for two reasons; it would help improve the user experience for a Verdes member, and it could be added to the improved website to increase the available knowledge and options members had in understanding the currency. After receiving data from the survey and semi-structured interviews, the team analyzed responses to determine what type of information was most needed within the infographic material. Then, depending on the topic, a story was developed for the infographic to determine what type of information we wanted to convey to persuade and educate the reader.

Methods to develop social media content, flyers, and website infographics followed WPI Academic Technology's Ultimate Infographic Design Guide. This guided the team in choosing the proper font, size, icon, information, and color selection within the infographics and provided stylistic design tips ("Ultimate infographic design guide", n.d.).

The team created the story concepts by following these guidelines to develop the infographics. Concepts were primarily drafted with pen and paper to establish the intended tone and message. Existing public-use templates were utilized, and unique designs were developed using digital graph paper and suggestions from design guides. The team then selected three main colors to use thematically and began to develop the final products in different styles depending on the intention of the respective infographic.

The final product of these infographics was developed using Krita, Clip Studio Paint, Adobe Illustrate, and Photoshop to create professional-quality infographic material. Original designs were drawn digitally using a Wacom Intuos Pro and a Surface Pro 4 tablet. These materials were created in hopes to better inform Verdes users with the intent to be published through Alianza Verdes's various media platforms as well as the redesigned website.

CHAPTER 4.0: FINDINGS

To increase the use frequency of Verdes, our study took a systematic approach to develop initiatives and educational tools for the currency. Verdes users could utilize these in the future to improve their understanding of the platform. Together, our research could be broken down into three main findings as to why members of the community were not using Verdes on a notable scale: poor user experience, lack of purchase options, and improper management structure.

4.1: POOR USER EXPERIENCE

Confusion about Verdes frequently appeared while conducting research. With a poorly designed and expired website, there were no resources for members to learn about the currency in an effective manner. In addition, Verdes was hosted on Cambiatus, a desktop-oriented exchange platform. This raised several issues. Mainly, while shopping, members of the public only carry a mobile phone. This forced shoppers to use a website with no mobile application, creating several barriers to use.

4.1.1: WEBSITE EVALUATION:

The previous iteration of Alianza Verdes's informational website, Verdes.earth, suffered from design issues causing its effectiveness as an educational resource to diminish. The idea of the website was to serve as a single hub of information that would explain the mission of Verdes, as well as how to effectively use it. During our evaluation, the team found that the website violated many of Nielsen's design heuristics. The website did not meet the standards for website design and caused readability and information retention issues.

Heuristic	Evaluation Result
1. Visibility of System Status	FAIL: Inactive QR code and links, but not a critical heuristic for the site’s nature
2. Match Between System and Real World	FAIL: Outdated information about Cambiatus, Verdes sign-up process
3. User Control and Freedom	Not Applicable: Advanced features not required for the site’s nature
4. Consistency and Standards	FAIL: Site navigation and layout are unoptimized
5. Error Prevention	Not Applicable: No sources of possible user error, including lack of forms to be filled by the user
6. Recognition Rather than Recall	FAIL: Lack of information and dead QR code in the “Registrarse” section
7. Flexibility and Efficiency of Use	Not Applicable: Advanced user shortcuts not required for the site’s nature
8. Aesthetic and Minimalist Design	FAIL: Walls of text and awkwardly placed infographics on entire pages with no supporting text
9. Helps Users Recognize, Diagnose, and Recover from Errors	Not Applicable: No source of user error, site is strictly informational
10. Help and Documentation	Not Applicable: Documentation is not required for use of the site

Table 2: Website Evaluation Table (Nielsen, 1994)

This table highlights and summarizes the results of the heuristic analysis along with why the website received its grade. Red fills represent failed heuristics. Green fills represent passing. Gray fills represent heuristics not applicable (N/A) to this website. In total, the website received 5 failing grades, and 5 N/A heuristics.

Some of Nielsen's heuristics did not apply to our website's evaluation, as they were not required for the nature of the website. Heuristics such as "User Control and Freedom", "Error Prevention", "Flexibility and Efficiency of Use", "Helps Users Recognize, Diagnose, and Recover from Errors", and "Help and Documentation" serve as guidelines for helping the user understand and efficiently use more complex systems; Verdes.earth serves solely as an informational website, and therefore does not need all of these features. We evaluated all heuristics but chose to analyze only those that were relevant to the website.

The first heuristic to evaluate was the "Visibility of System Status", meaning how well a user is kept informed about what is happening. The purpose of this website is to provide information to the community members about how to register for and use Verdes. As such, there is not much occurring technically that isn't visible to the user, such as background processes or information storage. For example, this website did not contain any form of a registration system, only a button hyper-linked to the Cambiatus website and an inactive QR code. This heuristic received a failing grade.

The next heuristic evaluated was "Match Between the System and the Real World." This heuristic is used to ensure the user can understand the website and its contents. This includes the user understanding the language as well as concepts presented by the website. Verdes.earth is intended for all members of the Monteverde community and should not require advanced technical expertise to understand. The website presented the basic concepts of Verdes and listed some of its theoretical benefits. However, not all were accurate representations of the Verdes project at the time of evaluation. The site contained text suggesting that, by using Verdes to pay for basic needs, users would have more Colones to spend on other expenses. This statement was inaccurate, as, through our interviews and surveys, our research found that one of the main complaints with Verdes was the inability to find vendors willing to accept Verdes in exchange for basic necessities. This heuristic received a failing grade due to its lack of clarity.

During the evaluation of the "Consistency and Standards" heuristic, the team compared Verdes.earth to industry standards for websites. While this can be difficult to measure, some aspects of the website were immediately noticeable, mainly how the website includes only infographic images, instead of text, in all pages except for the Frequently Asked Questions (FAQ) section. While these images are easily readable, they offer little depth for users who wish to learn more about Verdes. There is no information about Alianza Verdes, the history of Verdes, or its project mission on the main pages. Instead, users must navigate to the FAQ section, where they are met with a large amount of text. A well-designed website will have its information spread evenly across pages to break it up into smaller and more focused sections. This heuristic received a failing grade due to its lack of consideration during its design.

While evaluating “Recognition Rather than Recall”, the team found that the Verdes.earth navigation is fairly intuitive, except for one page. A QR code was located on the home page with the title “Registrarse” (register) above it and no further explanation. Additionally, this QR code appeared to be inactive. This heuristic failed and needed to be considered when redesigning the website.

The team found many issues when evaluating the website’s “Aesthetic and Minimalist Design” heuristic. The website's visual elements must support its primary goal of providing information about Verdes, and it fell short in several areas. Three of the six pages on the site contain only images, and the FAQ section provided a large wall of text. There were no images in the FAQ section, and it felt overwhelming to use. Additionally, there were language inconsistencies, such as the “Sobre” section being labeled with an English header reading “About” with inconsistent text stylization. Two of the pages, “Recurso” and “Contactanos” contained only WordPress placeholder infographics containing no information related to Verdes. Finally, there were small elements placed randomly around the website that did not relate to Verdes but could be easily edited or removed. This heuristic failed to pass our evaluation.

Although the website's purpose was simply to provide information, it violates many of Nielsen’s heuristics of user interface design. Many of these issues can be easily addressed, such as editing and styling text, whereas other areas require a more thoughtful redesign. The pages on the site are not properly utilized, as many contain only infographics with unrelated information. Together, they provide a poor aesthetic and complex design out of line with Jakob Nielsen’s 10 Heuristics for User Interface Design.

The website our team designed contains updated information, new infographics, and videos made by the team. Much of the information on the old website was outdated, such as the instructions for using the Cambiatus platform, and our group provided up-to-date instructions to help users register and use Verdes. The goal of the website was to provide a central informational hub that contains all the information a Verdes user would need to get started with Verdes or learn more about the currency. Our redesigned website provides a better user experience by breaking up information into smaller segments, using text to support images and infographics, and having more concise labeling and page navigation. This helps to eliminate several Verdes barriers of use by providing complete, in-depth tutorials for everything the user needs to know about Verdes.

4.1.2: POOR USER INTERFACE EXPERIENCE

Information gained from our interviews and survey found that confusion and poor user experience while trying to pay with the currency were the most significant barriers keeping members from using Verdes. When making a transaction in Verdes, a user needs three things: funds, access to their account, and the name of the user they wish to transfer their Verdes to. Responses collected from the survey suggest a barrier at each of these three stages.

Regarding access to funds, members had several ways to gain Verdes: through environmentally sustainable actions, direct purchase of Verdes with Colones, as well as offering goods or services on the marketplace. However, Verdes users are not generally informed of these methods, responding with statements such as: “I am unsure of how to earn Verdes” and “there are not enough opportunities to earn Verdes”. Through our website evaluation, we determined that these uncertainties developed due to an informational gap between users and the platform. Information resources available for users are limited to brief window posters and a currently inactive website. These proved to be inadequate to teach the public thoroughly enough for them to trust and use the currency.

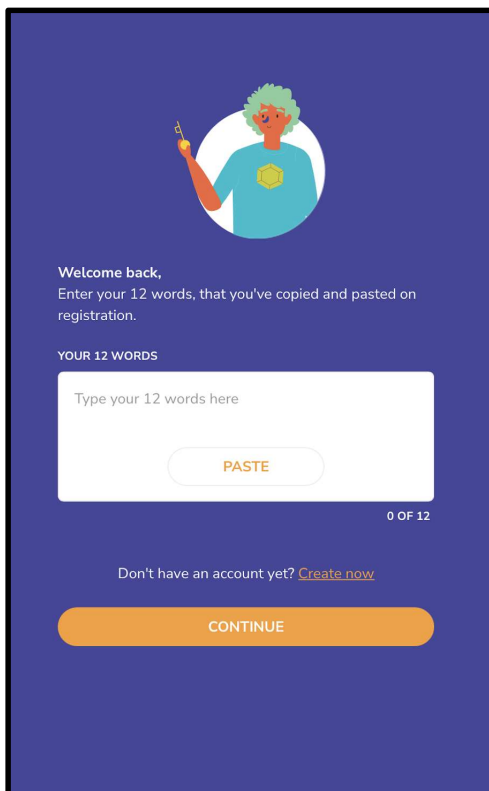


Figure 1: 12 Word Log-In

A screenshot of the 12 word log-in step to be completed with every sign-on.

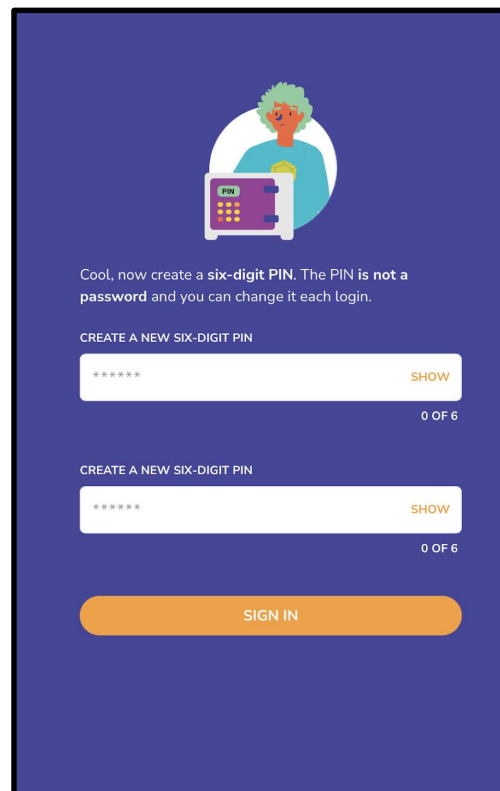


Figure 2: Creating a New 6-Digit Pin

A screenshot of the creation of a new 6-digit pin with every sign-on.

Accessing and transferring Verdes from account to account was another barrier our research identified. Accounts require a password consisting of 12 randomly generated words, shown in Figure 1, which are impossible to recover if lost. Some interviewees expressed anxiety over losing their password or having had to make new accounts in the past for this reason. In addition, each time a user logs into the site, they must also create a new, six-digit pin shown in Figure 2. The site used to exchange Verdes was optimized for desktops, not mobile phones, the latter being more common for users to carry while shopping. Successful local currencies such as Local Trade Partners in Arkansas, USA, also use a digital platform; however, it is downloadable as an application. This provides a way to make mobile transfers simple and easy. With Cambiatus, while making a payment, a user must follow a sign-in process taking several minutes. Our survey found that 55.74% of users had stopped using the currency, and when polled about this, a top answer as to why they had stopped was that using Verdes was “too complicated”.

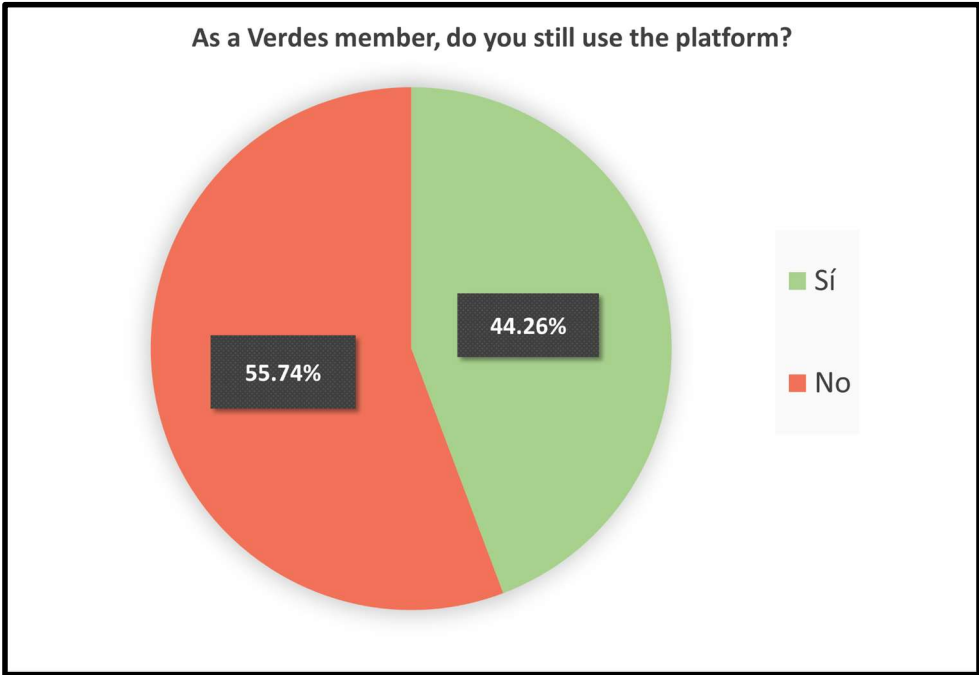


Figure 3: Pie chart by percent of members who still use Verdes.

This is a representation of the information collected from question seven on our survey asserting what percent of members still use Verdes

Reason	Percentage of responses
I'm not interested in anything I can buy with Verdes	26.19%
It is too complicated	21.43%
I forgot my login	21.43%
Incompatible with my phone	4.76%
I don't trust the platform	2.38%
Other	23.81%

Table 3: Survey responses explaining reason for discontinuing use

This table lists the responses and percentages explaining why members discontinued their use of Verdes.

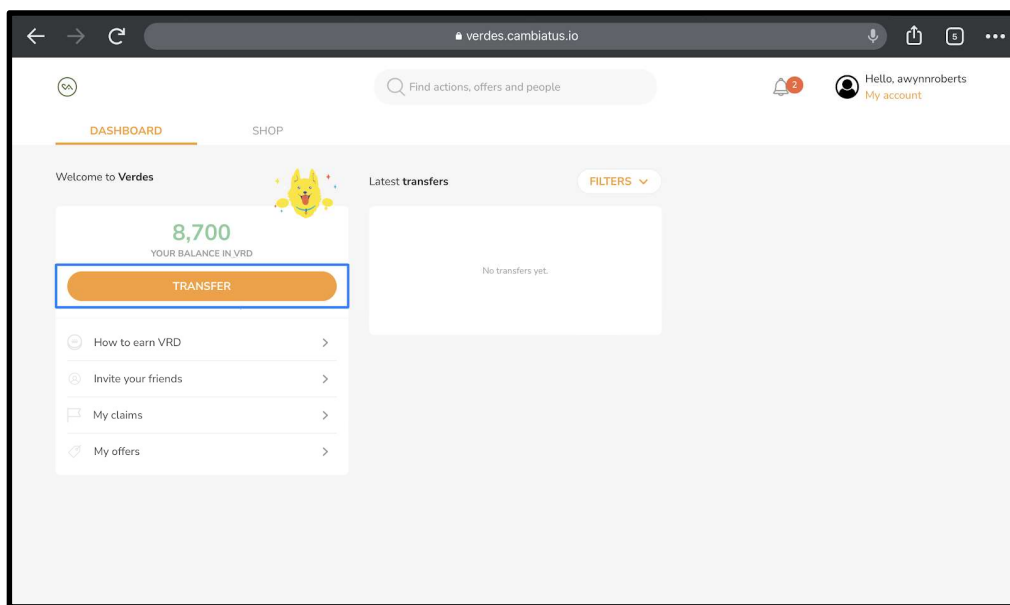


Figure 4: Transfer Button

This figure displays a screenshot of the first page of a Verdes transfer action indicating where a user can click in order transfer Verdes to another account

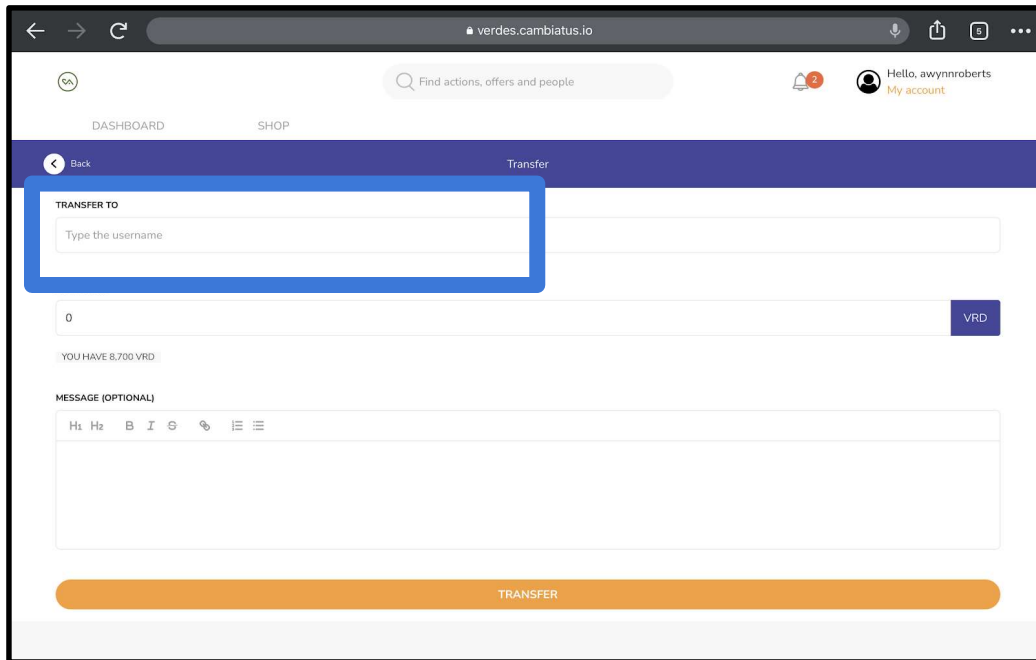


Figure 5: Transfer Verdes

This figure displays the second screen of the Verdes transfer action indicating where a user would input the username of the account they wished to transfer Verdes to, the amount they wished to transfer, and an optional message describing the reason for the transaction.

Finally, to spend Verdes, a user must know that a store accepts the currency. When transferring Verdes from one account to another, it is necessary to know the username of the account you wish to send funds to, as shown in Figure 5. If the store cashier is unfamiliar with Verdes and does not know the shop's username, you cannot complete a transaction. In addition, Verdes.earth was the only informational hub for the Verdes currency. Our team found that it lacked a comprehensive list of shops and artisans who would be willing to accept Verdes through heuristic analysis. This was reflected in our interview with Juliana, an employee of the Monteverde Vet clinic who talked about what she wished to purchase, “...I think food is the most important and, you know, vegetables and fruits and all this kind of produce”. When speaking to local market owners, Juliana stated, “I’ll buy them from them, but not many of them [accept] Verdes. They just accept money because it's easier.” Though Juliana expresses a need for produce available through the Verdes platform, other interviews conducted reveal that options were available. Mario, a local market owner who accepted 10% of sales in Verdes, sold essential items and produce at his shop. Due to a lack of information on stores that accepted Verdes, users had trouble finding ways to spend the currency even when they were available.

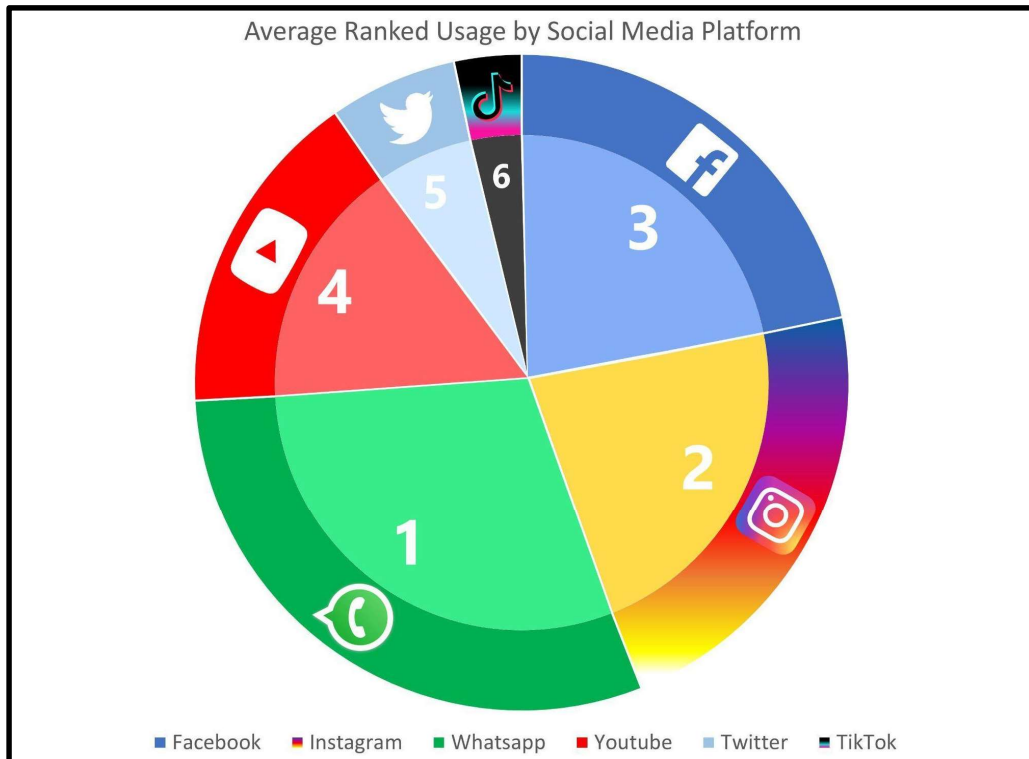


Figure 6: Social Media Usage Ranked

This figure displays the average usage ranking of social media platforms amongst surveyed Verdes members.

We found from our survey that the most used social media platforms in Monteverde included WhatsApp, Instagram, Facebook, and YouTube. Effectively informing the Monteverde community of the businesses that do accept Verdes is crucial to increase the currencies use. By utilizing Verdes positive community sentiment and targeting the most frequently used social media platforms, Alianza Verdes can efficiently target and inform the community through our educational resources.

4.2: LIMITED PURCHASE OPTIONS

One pressing issue identified through our team's research was the perceived lack of purchase options. Survey respondents listed this as the second largest reason for discontinuing their use. A monthly farmers market, called the Féria, was one of the integral locations where users were able to spend Verdes. However, their frequency had slowed during our team's research period as permits were needed to host these events. There were a total of eight stores within the community that accepted Verdes, but these shops were unknown to the majority of users. Additionally, the owners of these stores expressed complications with accepting Verdes. This resulted in currency bottlenecks, preventing the circulation necessary for a local currency's benefits to emerge.

4.2.1: LACK OF OPTIONS

Many users found themselves lost when it came to spending Verdes. Interview participants and survey respondents alike brought up that there were things to buy with Verdes, such as clothing items from the Tilichera. However these were non-essential items and did not reflect the needs of the community. When it came to necessities, such as groceries for the week or raw materials for a business's products, few options accepted Verdes. The locations that did provide essential items were incredibly popular, such as one market owned by Mario. Mario relayed that when he posted produce for sale completely in Verdes, they would be the fastest-selling products in his store. The main problem was a lack of information or marketing about items being sold for Verdes. Due to Alianza Verdes's poorly designed website, Mario only posted his deals in WhatsApp groups, making it difficult for new customers to find his store. Through our interviews with Verdes members, it became clear that there was a lack of knowledge when it came to which businesses accept the currency. Some users expressed the need to purchase certain items using Verdes while these options were, unbeknownst to them, available. This could be attributed to users' avoidance of the Cambiatus marketplace, due to its poor usability and the popularity of WhatsApp in the region.

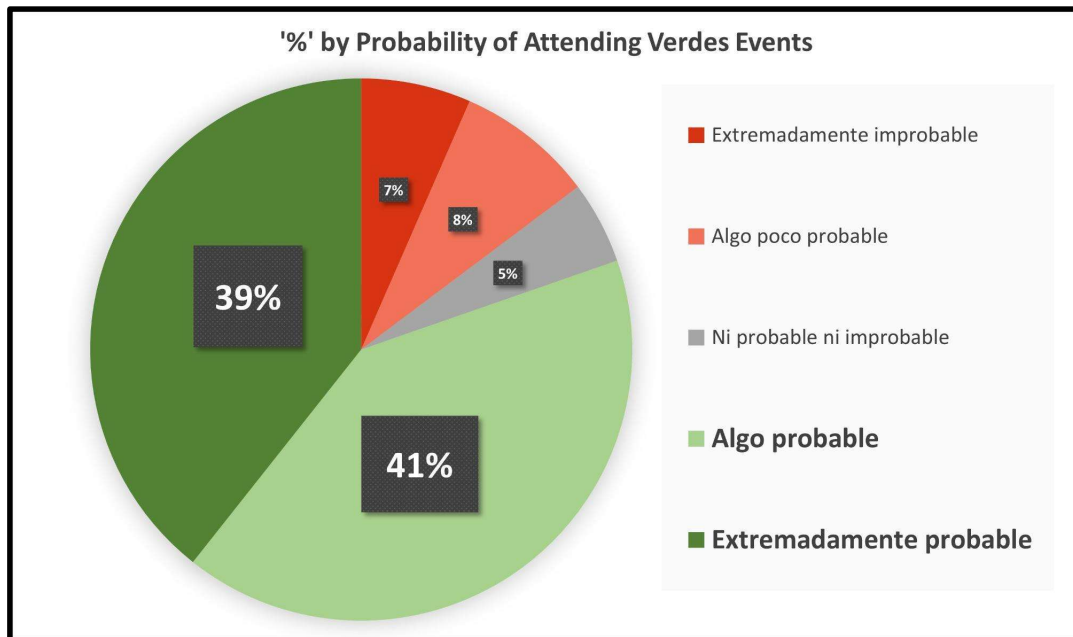


Figure 7: Survey Responses for Probability of Attending Verdes Community Events
This figure includes a pie chart representation of the interest in attending a Verdes community event.

Although users expressed a poor user experience, as well as missing crucial purchase options, Verdes social sentiment was positive. As shown in Figure 7, 80% of our survey respondents indicated they were likely to attend Verdes hosted events. This indicates users would

exchange the currency if outlets were available. We also found from our survey that 100% of respondents who did not actively barter were interested in using Verdes as a means of trade with neighbors. Bartering with neighbors for goods and services has historically been a large part of Monteverde's culture. Their openness to using Verdes as a modern implementation of their long-standing tradition shows there is the possibility of increasing the availability of essential goods such as home grown produce and eggs. However, with Cambiatus's poor user experience, this modern implementation of bartering has failed to gain traction. Providing the community with an improved user experience and effective educational content has the potential to revitalize this tradition, helping to combat the lack of options.

4.2.2: ACCUMULATION OF VERDES IN BUSINESSES

The main issue business owners faced was the inability to use Verdes for business expenses, such as labor and raw materials. As local currency directors our team interviewed described, this was one of the most significant problems a local currency could face.

Of the eight stores that accepted Verdes, the majority did so with a partial payment system. Products would be listed to be purchased in both Colones, and Verdes. Typically, items would be listed for 80-90% in Colones, and 10-20% in Verdes. This allowed shoppers to save some of their Colones for other expenses, while giving store owners some security. This was important as businesses need to pay their fixed costs such as rent and labor which can only be paid for in the fiat currency. Although businesses only accepted partial payment, They still reported that over time they were unable to effectively spend the Verdes they earned, leading to accounts containing millions of Verdes. Local currency directors that effectively prevented their currencies from over accumulating had a large variety of businesses who accepted the currency to prevent this. For example, Richard Creyer, the director of Local Trade Dollars would drive to stores if they over-accumulated trade dollars and give each specific business owner ideas for the best way to spend their trade dollars. However, as specified earlier this required a large variety of businesses who can offer different goods and services. Local Trade Partners launched with over 100 businesses on board, providing significantly more options than Verdes possessed from the start. Through our research we found no significant solution to address over-accumulation. The solution likely correlates with increasing the number of businesses who accept Verdes, however with limited background research into economics, our team was unequipped to address this issue during our short, four-week research period.

4.3: IMPROPER CURRENCY STRUCTURE & MANAGEMENT

Upon conducting interviews with various local currency directors, we compared various technical and management structures of the currencies. This exposure to different structures allowed our team to assess which forms were most effective in the creation of local currencies to

their specific goals. Additionally, local currency directors provided their own advice. Given their respective background and personal experiences running their currencies, we assembled information on how to best manage and produce a successful local currency. Our interviews on local currencies were conducted with Richard Creyer of Local Trade Partners, Mary Jeys of The Brooklyn Torch Project, Jeremy Cordon of Goldback, and Rachel Moriarty of the Schumacher Institute, a non-profit contractor on loan to BerkShares.

4.3.1: FOR PROFIT

Among the four local currency directors interviewed, three of their respective currencies were still in circulation: Local Trade Partners, Goldbacks, and Berkshares. Local Trade Partners, a merchant circle which trades using digital Local Trade Dollars, was founded during the 2008 economic recession, being in circulation for 14 years. Goldback, a state-wide physical local currency, was founded in 2019, being in circulation for three years.

Goldback, BerkShares, and Local Trade Dollars differ in most ways, although one thing they have in common is financial support. Goldback functions as a corporation. Though it is still a local currency and means of exchange, the Goldback bill is also a commodity and collector's item due to its incorporation of gold. Each 1\$ Goldback contains 1/1000 of an ounce of gold. Its identity as a product in addition to a means of exchange allows the Goldback to profit off of Goldback purchases. As of February 2022, the Goldback corporation pays twelve employees. They have also received over 110 million dollars to initially fund their project, spending 10 thousand on the website domain alone. Berkshares is run through a volunteer board, however, grants received allows them to hire outside contractors with economic backgrounds to maintain the platform and ensure reliability and success. Rachel Moriarty is currently paid by the Schumacher Institute, a non-profit established to provide support to local currencies.

Though Richard Creyer, founder of Local Trade Partners in Northwest Arkansas, did not mention any initial source of funding, once established, Local Trade Partners received 10% of all Local Trade Dollar transactions in the national currency. This allows the company's three employees to profit from the currency's success. Richard Creyer stated in our interview conducted on the 31st of January, 2022; "a lot of local currencies fail ... volunteers are not going to drive 40 miles to give somebody the pitch on this and then not make any money... there has to be something that keeps it going." This is something that Jeremy Cordon of Goldback also cautioned, "I would venture to say that the reason why there's so many dead local currencies is because there's usually one guy or two guys that are into local currencies that are really having to advocate for it all the whole time, and as soon as they get tired of doing it, the local currency falls apart and everybody runs for the exits." Without determined and profiting advocates for these currencies, many projects fail with a volunteer-based system. Unfortunately, The Brooklyn Torch Project was an example of this. Run by artist Mary Jeys from 2008 to 2013, The Brooklyn

Torch Project was a physical currency in the Brooklyn, NY region. In our interview conducted on the 4th of February 2022, Mary expressed that she had trouble separating herself from her own project, and people looked to her to be a constant advocate for the currency. She stated, “I feel a little bit, in all honesty, uncomfortable with the fact that I couldn’t figure out how to distance my own authority within my own art project.”

Management of a local currency is logistically difficult, requiring a large time commitment and stamina. As supported by the fate of The Brooklyn Torch and the statements by our interviewees, it was inferred that financial backing and profit for currency directors did make an impact on the success of the currency.

4.3.2: PHYSICAL VS DIGITAL CURRENCIES

One of the primary differences between local currencies includes the medium of exchange. Tying into ease of use, it is incredibly important that the method of transaction, whether it be physical or digital, is intuitive and secure. All of the currencies linked to our interviewees began as physical currencies, with two of the networks, Local Trade Partners and BerkShares, moving to a digital format. BerkShares introduced their digital currency as a compliment, where Local Trade Partners dropped their physical system entirely. According to Richard Creyer, Local Trade Partners began as a check system but moved to a digital format, implementing a QR code payment feature to further improve ease of transaction. As of February 2022, most transactions happen via the Local Trade Partners app with the occasional phone call transaction. Though Creyer expresses that the digital format has been very successful for Local Trade Dollars, the same does not stand for the digital Verdes platform. With ‘too complicated’ being the most popular survey response as to why users no longer exchange the currency. Alianza Verdes has had difficulties making the Verdes marketplace intuitive for users. Juliana, of the animal clinic, and Paula, of the community garden, both expressed issues accessing the marketplace. From our interview with Juliana, “I think that I have noticed that the problem is with the application ... the actual software itself is ... not very user friendly ... So sometimes I could click this, and then it’ll lock me out, and it’ll be back again.” Though the digital system works well for Local Trade Partners, a digital system alone is not enough to ensure ease of use.

When it comes to the physical currencies, both The Brooklyn Torch Project and Goldback had similar, yet differing, issues. Both currencies expressed troubles printing the currency. For Mary of The Brooklyn Torch Project, this was a financial concern. “There wasn’t really a papermaker that was making paper at the level that I could afford to print on.” Making a physical currency does not only concern financials but also safety. Mary stated that many community members were concerned that the currency could be easily counterfeited, and that “part of the work is sort of validating the safety and security of the network of a neighborhood.”

Ensuring people trust the currency and feel safe using it was very important to Mary. In an attempt to keep the bill unique, she embossed it with a seal. Goldback, due to its unique and patented printing technique, was not concerned with issues of counterfeits. However, the use of gold on such a small scale was an expensive and delicate process. Jeremy Cordon explained that the process is so particular and rare that they are out of stock and have not been able to produce more. Though both digital currencies and physical currencies have their benefits: ease of use, printing costs, and safety concerns can change which medium is best implemented for each community.

While Verdes has implemented its currency as a digital platform, our interviews concluded that regardless of physical or digital mediums, the most important quality is ease of use. The choice between implementing a physical or digital currency is highly dependent on the community and its specific limitations. These mediums can be equally successful when structured effectively.

4.3.3: MERCHANT CIRCLE

Many local currencies operate within merchant circles. Merchant circle is a term our team discovered to describe a network of businesses that trade amongst each other. This term was first introduced to us when used by Mary Jeys in our interview about her local currency, The Brooklyn Torch Project. She used this term to describe how many successful local currencies operate. She explains, “I think the most successful currencies that stand the test of time, are actually developed in a merchant’s circle where people who are already running a business understand that that network of merchants is the authority.” This statement implies that having a merchant’s circle will help decentralize authority on the currency, allowing currencies to operate as property of the community rather than as the sole responsibility of its director. Additionally, Local Trade Partners, which does operate as a merchant’s circle, has no issues with accumulation. Since all members involved in the currency are both producers and consumers, there are a large variety of purchase options available on the platform, allowing businesses to spend their earnings in the currency quickly and for in-demand products or services. Operating in a merchant’s circle, where all members of the platform are contributing to the value of the currency, allows the currency to be more independent, avoid accumulation, and have a large variety of purchase options, increasing value.

CHAPTER 5.0: CONCLUSIONS & RECOMMENDATIONS

Monteverde's economy relied heavily on tourism and travel, and Alianza Verdes sought to bolster a circular economy within the community. Verdes was started to allow members of the community to easily barter with one another while keeping the wealth within Monteverde. When used correctly, a local currency acts as a tool neighbors can use to exchange the products and services they would otherwise rely on outside members to provide.

Our project worked to gather information about local currencies around the world, learn from users of the currency, and explore the resources available to members. By collecting this information our project sought to improve the currency's use by bridging the informational gap between the currency and its users. This was done by improving existing resources such as the Verdes.earth informational hub, and by creating new educational resources such as best use infographics and tutorial videos. Furthermore, by collecting information from local currencies based in different regions, we developed recommendations for both the management structure as well as best practices. Examples of best practices include a payment structure for the currency's director, along with using the director's community ties. Best practices would also include catering and leveraging existing events and locations, such as Monteverde's monthly feria, and businesses such as the Tilichera. These recommendations were synthesized throughout our research, where differences emerged between the state of Verdes compared to other local currencies that had higher use and perceived value within their respective communities.

5.1: CREATION OF VERDES EDUCATIONAL MATERIAL

The information gap between Verdes and its users was prevalent throughout the data gathered by the survey and interviews with Verdes users. The original Verdes.earth website lacked a comprehensive list of businesses that accepted the currency. Both survey respondents and interviewees voiced that they were unaware of establishments where they could spend their Verdes. One of the write-ins within the survey even replied, "I thought they were no longer used." Creating informational and educational materials such as tutorials, videos, and infographics will help bridge this information gap and increase Verdes' use.

5.1.1: VERDES APP DOWNLOAD INFOGRAPHIC MATERIAL

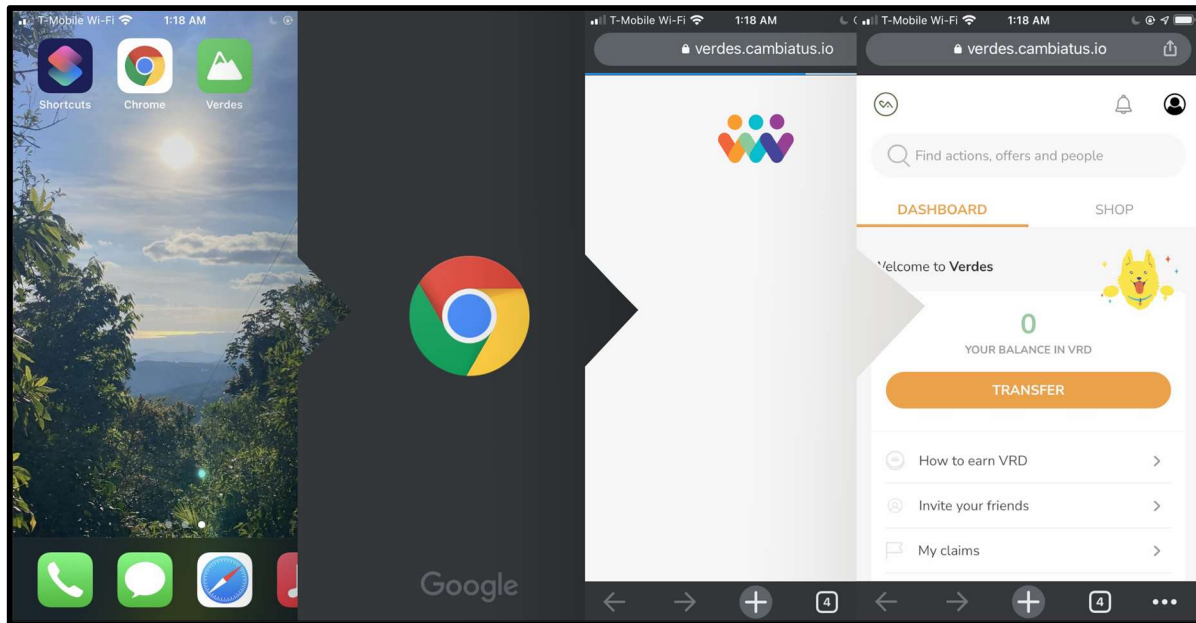


Figure 8: Cambiatus Exchange Platform as Application

This figure displays the simplified experience of accessing the transfer Verdes feature when the website has been downloaded as a home screen application.

Based on our findings, the user experience of buying and selling products or services with Verdes was poor, and a barrier that kept people from using the currency. As stated in section 4.1.2, without a mobile app members had a difficult time using the platform in an efficient manner. Although it is an imperfect solution, mobile phones have the ability to bookmark webpage shortcuts onto their home screens as shown in Figure 8. providing a more elegant solution than simply using a web browser. Based on information gathered and the technology solutions available today, an infographic was created alongside a tutorial video, walking members through the steps to create a homepage shortcut for the Cambiatus exchange platform. By downloading a homepage shortcut users also bypass the tedious sign-in process which significantly improves user experience.

5.1.2: VERDES TUTORIAL VIDEOS

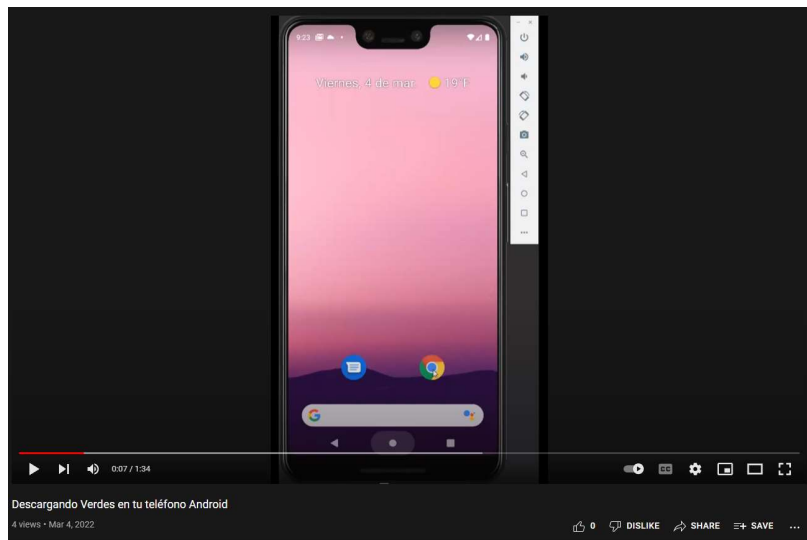


Figure 9: YouTube Tutorial Video for Cambiatus Download on Android

This figure showcases the tutorial video teaching viewers how do download Cambiatus.io as an application on their Android home screen

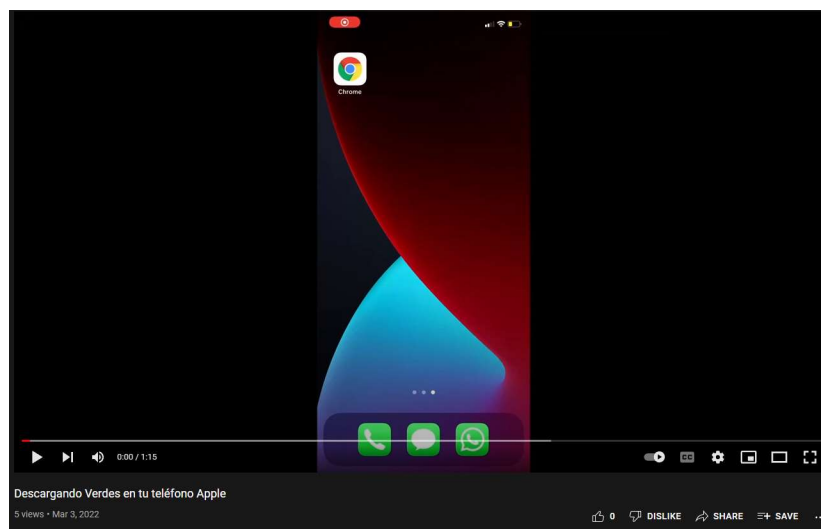


Figure 10: YouTube Tutorial Video for Cambiatus Download on Apple

This figure showcases the tutorial video teaching viewers how do download Cambiatus.io as an application on their iPhone home screen

Our team developed educational videos to assist members of the community in using Verdes effectively. These tutorials include how to exchange Verdes in a physical store, as well as teaching users about simplifying the sign in process as shown in Figure 9 and Figure 10. These tutorial videos work alongside matching infographics in order to provide options for the end user in a manner that best suits their learning style.

5.1.3: REDESIGNED WEBSITE

Verdes.earth was redesigned to be easily visible and readable. It contains all previously mentioned educational content as well as links to the Verdes social media pages where users can find more frequent updates about events and the state of Verdes.

5.2: RECOMMENDATIONS

5.2.1: RECOMMENDATION FOR NEW WEBSITE IMPLEMENTATION

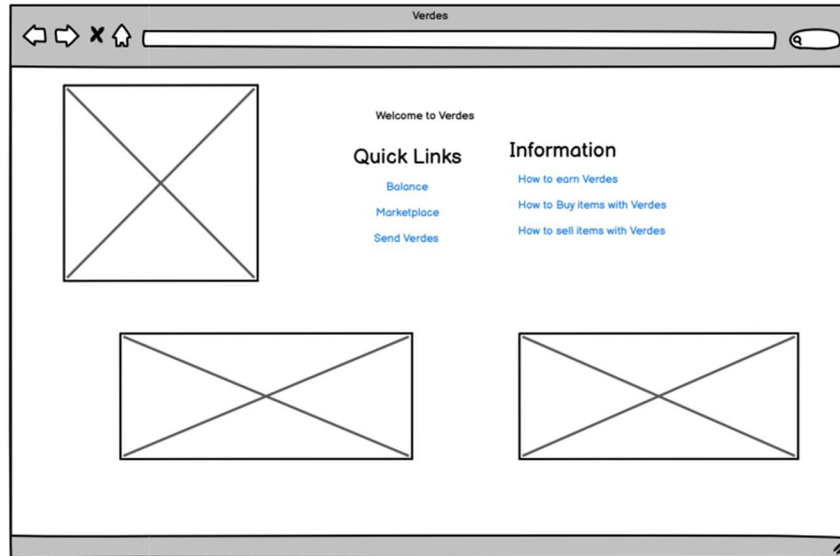


Figure 11: Website Homepage Wireframe

This figure displays the website homepage concept designed during wireframing stage.

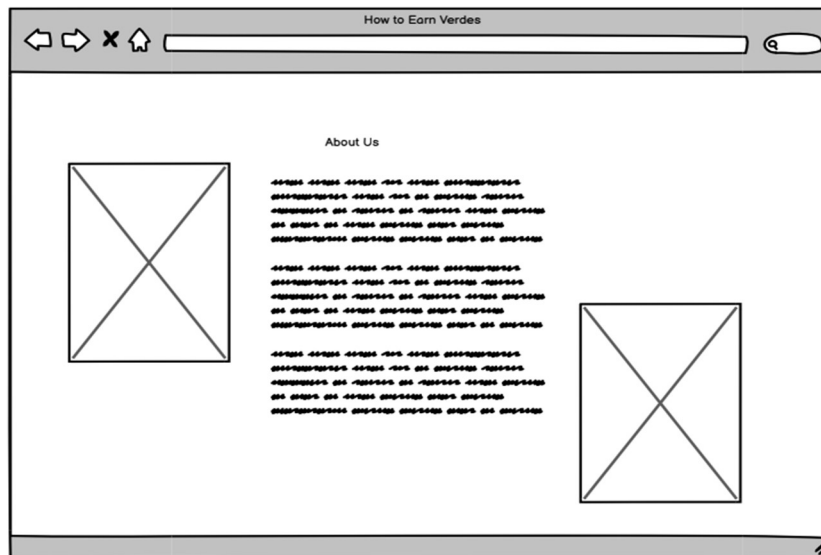


Figure 12: Website "About Us" Wireframe

This figure displays the website "About Us" concept designed during wireframing stage.

During the design process, our team created wireframes to help plan out the website's layout as shown in Figure 11 and Figure 12. Building on these wireframes, the new Verdes.earth website is ready to be hosted on the internet. Alianza Verdes has access to the website's WordPress files. We recommend Alianza Verdes update the website when information becomes outdated, as this was an issue identified in the previous website iteration. The new domain, Verdesmonteverde.com, will serve as the informational hub for Verdes. To further the effectiveness of Verdes, we recommend they also use the social media accounts linked to the website, where users can find consistent updates to the project and news about Verdes community events.



Figure 13: Website Home Page

The top half of the website home page of Verdesmonteverde.com is shown in this figure.



Video de comprar con Verdes en una tienda

En este video, se mostramos cómo usar Verdes en las tiendas

Cómo agregar Verdes a la pantalla de inicio de su Android

Cómo agregar Verdes a la pantalla de inicio de su iPhone

Figure 14: “How to Use Verdes” page

This figure displays a page which contains video tutorials showing the user how to use Verdes at stores and create a shortcut on their phone’s home screen.

Our website implementation included five pages; a home page, a “How to Use Verdes” page, a location page, a contact page, and a frequently asked questions page. The home page, shown in Figure 14, contains basic information about Alianza Verdes and their mission statement. It also contains a quick link to the Verdes registration page on Cambiatus so users can easily get started. In our “How to Use Verdes” page, as shown in Figure 14, we have a video tutorial demonstrating the purchase of coffee from a café that accepts Verdes. Additionally, there are two linked blog posts with our infographics and video tutorials showing users how to add Verdes to the home screen of their phone, for iPhones or Androids. The other sections contain information about places in the community that accept Verdes, as well as a way to contact

Alianza Verdes through email. There is also a frequently asked questions section where our team answered common misconceptions that appeared frequently in our interviews with Verdes users. Verdes social media accounts are linked on the website home page, as well as at the bottom of every section, so the users can easily find the associated accounts. Our final design differed from our wireframes, but it holds the same functionality our team originally conceived during our wireframing process, such as quick buttons to find information about Verdes.

5.2.2: MANAGEMENT STRUCTURE

Conducting interviews with local currency directors and consulting a WPI business professor revealed that local currencies are most successful when conducted in a merchant circle on a non-volunteer-backed system. In many cases, volunteer-based systems fail due to their reliance on few individuals for very intensive work. For this reason, we suggest that Verdes find funding in order to employ someone part-time to sustain the currency. Additionally, Verdes does not operate in a merchant circle, where producers are the ones exclusively using the currency to trade amongst each other. To promote the value brought by a merchant circle without uprooting the structure of the currency, it is suggested that Alianza Verdes implement some minimum contribution to the platform over certain durations of time. This would help increase the value of Verdes by expanding the spending options as well as encourage users to be actively thinking about and using the platform if they wish to continue to be part of this community.

5.2.3: OUTREACH WITH LOCALS TO INCREASE ENGAGEMENT

With a close-knit community such as Monteverde, the most effective way to reach people is to talk to them. A significant majority of members surveyed and interviewed said they heard about Verdes through word of mouth, mainly through neighbors and friends. Other local currency directors also often knew a majority of people within their communities. The directors of Verdes already have connections such as these and should take full advantage of them when promoting the currency. Their status within the community will allow them an easier time when approaching business owners about accepting the currency and when talking to community members about Verdes. Using these connections, the operating director of Alianza Verdes should meet with the businesses they have connections with, and discuss the benefits accepting Verdes can bring to their business.

While going from business to business in person is the most engaging outreach method, it is not efficient for a large audience. Many members of the Monteverde community use social media, and therefore it is equally as essential to take advantage of Verdes' positive social sentiment and the reach online posting can have. For example, Alianza Verdes's Instagram account had 419 followers, giving them advertising potential for new business. Through our

interviews, we found that using a branded account to promote the currency as well as the business accepting Verdes would be an effective tool to increase Verdes' visibility. A branded account will also allow Verdes to separate itself from its directors and organizers, acting as its own separate entity.

5.2.4: RECOMMENDATIONS FOR FURTHER RESEARCH

Verdes encounters the same issues as any currency, including supervision, regulation, inflation, and over-accumulation. Successful currencies require proper management, on a large scale such as the United States Federal Reserve, or small scale, as we found when talking to Richard Cryer, the director of Local Trade Dollars.

We recommend that the next team working with Alianza Verdes, in their background research, thoroughly explore economic systems and the actions used to manipulate a currency. During our research period Verdes was run by two volunteers busy with other projects and full-time jobs. Verdes' directors also had little experience with economics and there was no oversight as to how much, where, and when the currency was being spent. Further research should be conducted around economics in general, with recommendations made based on successful models applied specifically to the Monteverde community.

Furthermore, the next team of researchers should not solely focus on sentiments from the community, but rather focus their attention towards directors of successful local currencies, and the previously mentioned economic systems. Some of the most insightful information we gathered came from these sources; however, they were not an initial focus of our study. Our research was conducted over a seven-week period. Four of these weeks were spent in Monteverde, with the remaining time being remote in Worcester, MA. This short time frame made it difficult to assess the impacts our study had, including the sustainability of our recommended changes. While the information provided in this report is based on our extensive research, these background research recommendations will help further improve the quality of recommendations to Alianza Verdes.

5.3: CONCLUSION

By hosting our redesigned website and posting frequently on social media, Alianza Verdes's presence will be felt more in Monteverde, and it will be easier for people to get involved. Keeping the community updated about upcoming events and changes to Verdes is important to support the active user base, as well as draw in new users. The website has everything a Verdes user needs to know while getting started with Verdes, and helps the user easily find the social media accounts they can follow to be involved with Verdes news. The resources we created were designed to close the informational gap. By streamlining the poor user

experience, one of the main barriers members encountered, we hope to revitalize the currency and see an increase in Verdes' use.

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APPENDICES:

APPENDIX A: IRB APPROVAL LETTER AND IRB ORAL CONSENT SCRIPT

WORCESTER POLYTECHNIC INSTITUTE

100 INSTITUTE ROAD, WORCESTER MA 01609 USA

Institutional Review Board

FWA #00030698 - HHS #00007374

Notification of IRB Approval

Date: 13-Jan-2022

PI: Sarah Strauss

Protocol Number: IRB-22-0331

Protocol Title: Alternative Currency Expansion for Monteverde

Approved Study Personnel: Roberts, Andrew W~Aloise, Megan E~Whalen, Nicholas J~Colon-Heyliger, Allison~Strauss, Sarah~

Effective Date: 13-Jan-2022

Exemption Category: 2

Sponsor*:

The WPI Institutional Review Board (IRB) has reviewed the materials submitted with regard to the above-mentioned protocol. We have determined that this research is exempt from further IRB review under 45 CFR § 46.104 (d). For a detailed description of the categories of exempt research, please refer to the [IRB website](#).

The study is approved indefinitely unless terminated sooner (in writing) by yourself or the WPI IRB. Amendments or changes to the research that might alter this specific approval must be submitted to the WPI IRB for review and may require a full IRB application in order for the research to continue. You are also required to report any adverse events with regard to your study subjects or their data.

Changes to the research which might affect its exempt status must be submitted to the WPI IRB for review and approval before such changes are put into practice. A full IRB application may be required in order for the research to continue.

Please contact the IRB at irb@wpi.edu if you have any questions.

Informed Consent Agreement for Participation in a Research Study

Principal Investigators: Sarah Strauss: sstrauss@wpi.edu

Student Investigators: Megan Aloise, Allison Colon, Andrew Wynn Roberts, Nicholas Whalen

Team Contact Information: gr-verdes2022@wpi.edu

Title of Research Study: Increasing Verdes Use: a local currency designed to foster economic independence through a circular economy.

Sponsor: Alianza Verdes

Purpose: To gather information about personal experience around the Verdes local currency

Hello, thank you for joining us. We are a team of American university students who attend WPI, or Worcester Polytechnic Institution in Massachusetts, USA. We have been working with the local committee Alianza Verdes surrounding the use of the local currency Verdes over the past few months. Today we are looking to ask you questions relating to Verdes to build information on how it can be improved. The information we gain from these interviews will be recorded and analyzed, and this is going to be used to create educational material for the local currency Verdes.

Today, with your permission, we will be recording your responses, which may be used and published in our final report. Is that ok with you?

YES | NO

When our project is published, would you like your name to be kept confidential?

YES | NO

If **not**, we are looking to capture pictures that show our interview processes. Do you give us permission to take photos of this interview?

YES | NO

Also with your permission, we would like to audio record your responses today which may be transcribed and referenced within our project. However we will be taking precautions to protect your information, including storing any information on a locked computer. The information gathered from this interview will contribute to our final report, which will be published by WPI and also made available at the Monteverde Institute Library. Do you give permission for us to record this interview?

YES | NO

PRESS RECORD. The microphone is now recording the interview and we will be walking you through our questions. Please answer to the best of your ability, and if you do not know an answer, wish to skip a question, or want to end your interview you may do so when you like.

[Spanish] Informed Consent Agreement for Participation in a Research Study

Principal Investigators: Sarah Strauss: sstrauss@wpi.edu

Student Investigators: Megan Aloise, Allison Colon, Andrew Wynn Roberts, Nicholas Whalen

Team Contact Information: gr-verdes2022@wpi.edu

Title of Research Study: Increasing Verdes Use: a local currency designed to foster economic independence through a circular economy.

Sponsor: Alianza Verdes

Propósito: recopilar información sobre la experiencia personal en torno a la moneda local Verdes

Hola, gracias por acompañarnos. Somos un equipo de estudiantes universitarios estadounidenses que asisten a WPI, o Institución Politécnica de Worcester en Massachusetts, EE.UU. Hemos estado trabajando con el comité local Alianza Verdes sobre el uso de la moneda local Verdes durante los últimos meses. Hoy queremos hacerle preguntas relacionadas con Verdes para generar información sobre cómo se puede mejorar. La información que obtengamos de estas entrevistas se registrará y analizará, y se utilizará para crear material educativo para la moneda local Verdes.

Hoy, con su permiso, registraremos sus respuestas, las cuales podrán ser utilizadas y publicadas en nuestro informe final. ¿Está bien contigo?

SÍ | NO

Cuando se publique nuestro proyecto, ¿le gustaría que su nombre se mantuviera confidencial?

SÍ | NO

Si no, buscamos capturar imágenes que muestren nuestros procesos de entrevista. ¿Nos das permiso para tomar fotos de esta entrevista?

SÍ | NO

También con su permiso, nos gustaría grabar en audio sus respuestas hoy, las cuales pueden ser transcritas y referenciadas dentro de nuestro proyecto. Sin embargo, tomaremos precauciones para proteger su información, incluido el almacenamiento de cualquier información en una computadora bloqueada. La información recopilada de esta entrevista contribuirá a nuestro informe final, que será publicado por WPI y también estará disponible en la Biblioteca del Instituto Monteverde. ¿Nos das permiso para grabar esta entrevista?

SÍ | NO

PRESIONE GRABAR. El micrófono ahora está grabando la entrevista y lo guiaremos a través de nuestras preguntas. Responda lo mejor que pueda, y si no sabe una respuesta, desea omitir una pregunta o desea finalizar su entrevista, puede hacerlo cuando lo desee.

APPENDIX B: SEMI-STRUCTURED INTERVIEW GUIDE FOR VERDES USERS

ENGLISH VERSION

Interview Questions:

Before we begin: read oral consent script

- What has been your experience with Verdes so far?
 - o Do you know why Verdes was established?
 - o Do you use Verdes in your everyday life?
 - o Do you know the two ways of getting Verdes?
- Have you used the marketplace to buy or post items for sale?
 - o Tell me about your buying/selling experience.
 - o What has kept you from using the marketplace/buying or selling Specifically?
 - * If they have used the marketplace: Have you continued to use the marketplace?
If not, what made you stop?
- What would you like to see implemented/changed in the marketplace?
 - o Ask them to compare the marketplace with other online retailers such as Amazon and Ebay.
 - o Do you trust the marketplace?
 - > Is there anything that would increase your trust in the marketplace?
 - > If you knew more about how to use the marketplace, such as through a tutorial, would you use it more?
 - > Are you comfortable meeting a stranger from the marketplace in order to sell a listing?
 - o Would you be more likely to use Verdes on your phone if there was an App?
- Where would you like to use Verdes?
 - o Any store that you wish accepted Verdes?
 - o What do you wish you could buy with Verdes? (Goods, services)
 - o Would you participate in community events centered on Verdes?
- Verdes is considering creating a monthly lottery. Tickets would cost around 650 Colones, with first place winners receiving a prize in Verdes, and runner ups receiving items donated from the community
 - o Would you participate in a lottery?
 - o (if yes) How many trinkets would you buy?

- o (if no) what would keep you from participating?

- Post-interview, ask for follow-up contact, and references to others who may be willing to be interviewed.

SPANISH VERSION

Preguntas de Entrevistas:

Antes de Empezar: leer el gui3n de consentimiento oral

- ¿Cuál ha sido su experiencia con los Verdes hasta ahora?
 - o ¿Sabes por qué se creó Verdes?
 - o ¿Usas Verdes en tu vida diaria?
 - o ¿Conoces las dos formas de conseguir Verdes?
- ¿Ha utilizado el mercado para comprar o publicar artículos para la venta?
 - o Cuéntame sobre tu experiencia de compra/venta.
 - o ¿Qué le ha impedido usar el mercado/comprar o vender específicamente?
 - * Si han utilizado el mercado: ¿Ha seguido utilizando el mercado?
 - Si no, ¿qué te hizo parar?
- ¿Qué le gustaría ver implementado/cambiado en el mercado?
 - o Pídale que comparen el mercado con otros minoristas en línea como Amazon y Ebay.
 - o ¿Confías en el mercado?
 - > ¿Hay algo que aumentaría su confianza en el mercado?
 - > Si supiera más sobre cómo usar el mercado, por ejemplo, a través de un tutorial, ¿lo usaría más?
 - > ¿Se siente cómodo conociendo a un extraño del mercado para vender un listado?
 - o ¿Sería más probable que usaras Verdes en tu teléfono si hubiera una aplicación de teléfono?
- ¿Dónde le gustaría usar Verdes?
 - o ¿Alguna tienda que desee que acepte Verdes?
 - o ¿Qué te gustaría poder comprar con Verdes? (Bienes o servicios)
 - o ¿Participaría en eventos comunitarios centrados en Verdes?
- Verdes está considerando crear una lotería mensual. Los boletos costarían alrededor de 650 Colones, los ganadores del primer lugar recibirían un premio en verde y los finalistas recibirían artículos donados por la comunidad.

- o ¿Participarías en una lotería de Verdes?
- o (en caso afirmativo) ¿Cuántos boletos compraría?
- o (si no) ¿qué le impediría participar?

- Después de la entrevista, solicite contacto de seguimiento y referencias a otras personas que puedan estar dispuestas a ser entrevistadas.

APPENDIX C: SURVEY GUIDE FOR VERDES USERS

ENGLISH VERSION

Guide:

Q1 - Where did you first hear about Verdes? If other, write where you first heard of Verdes in the text box.

Q2 - Are you aware that you can earn Verdes through environmentally sustainable behavior?

Q2.1 - How often do you claim Verdes by acting in an environmentally sustainable way?

Q2.2 - How likely would it be that you would use Verdes knowing that it helps the local environment?

Q3 - How often do you barter with members of your community instead of paying for goods or services?

Q3.1 - Would you consider using Verdes to trade with members of your community?

Q4 - Do you prefer to shop online or in person?

Q5 - Do you sell products online? (Using Facebook Marketplace, eBay, Verdes Marketplace, Etsy, etc.)

Q5.1 - Do you often sell things online outside of Verdes Marketplace? (Ex. Facebook Marketplace, Etsy, etc.)

Q5.2 - How often do you sell products, services or trade in the Verdes market?

Q6 - What are the chances that you will participate in a community event promoted by Verdes? (for example, a farmers market where they accept Verdes, community fair/feria, etc.)

Q7 - As a Verdes member, do you still use the currency?

Q7.1 - Please provide the reason why you stopped using Verdes. Please select all valid answers

Q8 - Please rank your social media usage by time online (1 - most used, 5 - least used)

To sort the listed items, drag and drop each item in order of usage time.

Q9 - Which of the following groups contains your age?

Q10 - Select your gender

Q11 - What is your occupation?

Q12 - When did you create a Verdes account?

Q13 - Would you be willing to participate in a short interview (~30 minutes) with our team to discuss how we can improve Verdes for the community? If you select "Yes", you will be asked to provide your name, email address and WhatsApp. Our team will conduct these interviews in person to gain a greater understanding of how to improve Verdes. Your contact information will be used solely to contact you to schedule a time and place for our interview.

Thank you for being open to the interview! Can we receive your name, email and/or WhatsApp for future contact?

Q13.1 - Name:

Q13.2 - Email address:

Q13.3 - WhatsApp:

SPANISH VERSION

Survey:

Q1 - ¿Dónde se enteró por primera vez de Verdes? Si es otro, escriba dónde escuchó por primera vez de Verdes en el cuadro de texto.

Q2 - ¿Es consciente de que puede ganar Verdes a través de un comportamiento ambientalmente sostenible?

Q2.1 - ¿Con qué frecuencia gana Verdes actuando de manera ambientalmente sostenible?

Q2.2 - ¿Qué tan probable sería que usara Verdes sabiendo que ayuda al medio ambiente local?

Q3 - ¿Con qué frecuencia realiza trueques con miembros de su comunidad en lugar de pagar por bienes o servicios?

Q3.1 - ¿Consideraría usar Verdes para intercambiar con miembros de su comunidad?

Q4 - ¿Prefieres comprar en línea o en persona?

Q5 - ¿Venden productos en línea? (Usando Facebook Marketplace, eBay, Verdes Marketplace, Etsy, etc.)

Q5.1 - ¿A menudo vende cosas en línea fuera de Verdes Marketplace? (Ej. Facebook Marketplace, Etsy, etc.)

Q5.2 - ¿Con qué frecuencia vende productos, servicios o comercia en el mercado de Verdes?

Q6 - ¿Qué posibilidades hay de que participe en un evento comunitario impulsado por Verdes? (por ejemplo, un mercado de agricultores donde aceptan Verdes, feria comunitaria, etc.)

Q7 - Como miembro de los Verdes, ¿todavía usa la moneda?

Q7.1 - Proporcione la razón por la que dejó de usar Verdes. Por favor seleccione todas las respuestas válidas

Q8 - Clasifique su uso de las redes sociales por tiempo (1 - más usado, 5 - menos usado)

Para clasificar los elementos enumerados, arrastre y suelte cada elemento en orden de tiempo de uso.

Q9 - ¿Cuál de los siguientes grupos contiene su edad?

Q10 - Selecciona tu género

Q11 - ¿Cuál es su ocupación?

Q12 - ¿Cuándo creaste una cuenta de Verdes?

Q13 - ¿Estaría dispuesto a participar en una breve entrevista (~30 minutos) con nuestro equipo para analizar cómo podemos mejorar Verdes para la comunidad? Si selecciona "Sí", se le pedirá que proporcione su nombre, dirección de correo electrónico y WhatsApp. Nuestro equipo realizará estas entrevistas en persona para obtener una mayor comprensión de cómo mejorar Verdes. Su información de contacto se utilizará únicamente para comunicarnos con usted a fin de programar una hora y un lugar para realizar nuestra entrevista.

¡Gracias por estar abierta a la entrevista! ¿Podemos recibir su nombre, correo electrónico y/o WhatsApp para un futuro contacto?

Q13.1 - Nombre:

Q13.2 - Dirección de correo electrónico:

Q13.3 - WhatsApp:

APPENDIX D: SEMI-STRUCTURED INTERVIEW GUIDE LOCAL CURRENCY DIRECTORS

Interview Questions:

Before we begin: read oral consent script

- What is your background?
- How would you describe the operation of your local currency? i.e. How do businesses and consumers use it to their gain?
- How did you get people to sign up (and actually use it)?
- What kind of incentives were most effective at getting ppl to sign up?
- Was the currency created with any particular goals in mind?
 - o how has the currency/goals evolved over time?
- What is one thing you wish you had done differently when you launched the currency?
- What were your biggest challenges with getting people to use the currency?
- What advantages does your currency offer over the national currency?
- How did you promote the currency?
- How did you maintain interest in the currency?
- What is the most common method of transaction -- code, app, website, etc?
- What did you do to get business to accept your LC as payment?
- What do businesses do with their accumulated currency?
 - o Do you pay employers in part?
 - o Can they pay distributors in LC?
 - o Can they buy Fiat currency with LC?
- Do you have any questions for us?

