Unveiling The Invisible Web of Blockchain and Enhancing Agribusiness Sustainability

Leveraging Sensedia and blockchain technology, Uisa, a major biorefinery in Brazil, guarantees end-to-end traceability from the supply chain to the consumer.

By The Shift Marketing*

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Spanning across a whopping 90 thousand hectares of sugar cane farmland in Nova Olímpia (MT), all the way to those everyday supermarket shelves, Demerara Itamarati's sugar undertakes a journey that's powered by none other than the consumers.

Accessing the details is straightforward – **grab a phone, position its camera towards the QRCode on the packaging, and voilà!** All the information about the creation of this batch of sugarcane becomes available.

And here's the interesting bit – all this information is managed using Sensedia's platform. They're the tech experts operating behind the curtain, making sure you get a deeper understanding not only of the sugar's journey but also uncovering **Uisa's notable sustainability initiatives**. And when it comes to Uisa, they're a major contender. Positioned as one of Brazil's major biorefineries, their purpose revolves around converting renewable resources into useful items such as biofuels, biomethane, clean energy, and even animal feed, alongside several other environ mentally friendly products that benefit the planet.

Behind that unassuming **QR code** lies a groundbreaking and ambitious project in the world of agribusiness. Driven by ambitious goals and the integration of blockchain and tokenization to ensure traceability throughout the company's bio-product chain, the project goes a step further by giving customers the power to make a real impact.

They have the opportunity to offset the carbon footprint by purchasing **"carbon credits."** This initiative plays a part in Uisa's commitment to social and environmental impact. **As a certified bio-refinery under RenovaBio**, it's authorized to trade carbon credits (CBios). In the 2021/22 harvest alone, it generated 113,000 CBios.

Starting in 1993, **Uisa has been generating bioenergy from sugar cane biomass for its own use**. Then, in 2001, they took it a step further by selling clean and renewable energy to their supply chain, making a significant contribution to Brazil's energy efficiency endeavors.

They've got a remarkable track record: **92% of all residues resulting from agricultural and industrial processes are reused and recycled.** By embracing renewable agriculture, Uisa not only keeps their sugar cane farming soil healthy but also plays a part in carbon capture. The farming process itself chips away at the carbon footprint, as the sugar cane absorbs carbon from the atmosphere, leaving a positive environmental impact in its wake.

In 2022, the collaboration between Uisa and Sensedia took shape, **aiming to enhance and streamline all operations.** They worked on integrating legacy systems into the blockchain ecosystem using Sensedia's platform. This move paved the way for complete product and component traceability right up to clients and consumers.

Once they had meticulously outlined and documented all their sustainability endeavors in their company reports, the next step was to bring this technology to the market in an appealing manner. The incorporation of blockchain and tokenization in this initiative underscores a comprehensive dedication to sustainability. It's an impressive collaboration involving Uisa's IT and innovation departments, seamlessly orchestrated with the expertise of tech partners like Sensedia, AWS, Google Cloud, and IT Lean.

According to **Rodrigo Gonçalves, Uisa's Director of Tech and Innovation**, "Uisa's green mindset is a prominent aspect."

Rodrigo Gonçalves
Uisa's Director of Technology and Innovation

We had a conversation with Rodrigo about this project. Check out some excerpts from his interview below:

Thoughts on innovation

"We find ourselves in the third largest state in Brazil, a home to **3.8 million residents**. It's a vast land brimming with opportunities. If we took on challenges with the same dedication and strategic approach as our counterparts in the south and southeast, we could essentially reshape the entire country. Our focus is on utilizing technology and innovation to catalyze growth in our enterprise. Whether it's within the **Agribusiness sector**, our administrative processes, or any facet of our operations, we're committed to integrating innovation to simplify our procedures. Naturally, this translates to increased revenue and the kind of growth our investors are seeking."

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"We like to innovate, we're drawn to exploring diverse approaches and we're far from content with traditional methods. Be it in the context of this blockchain project or any of our numerous other initiatives, we consistently pose the question: 'Why can São Paulo do this, and why can't we do the same here in Mato Grosso?'"

Sustainability at its core

"The project kicked off roughly two and a half years ago, prompted by a challenge from one of our investors to shift our thinking and integrate blockchain for achieving complete product traceability. Also, our inclination to disrupt the norm stems from the fact that our industry often faces scrutiny and skepticism, especially being situated in Mato Grosso."

"There are misconceptions about controlled burns, logging, deforestation, and encroachments, not only in Brazil but globally. With **42 years in the business and the distinction of being the third-largest industrial sugar cane biorefinery on a global scale**, we're committed to pushing boundaries."

"Partnering with our innovation department, we made the call to build a blockchain system. We're able to lay out precisely what we do, how we do it, and emphasize our commitment to **100% renewable energy**, sustainability, and innovation. We stand behind eco-consciousness – our operations neither pollute nor involve deforestation."

The primary challenge was to make all this information accessible to consumers through our packaging – **information that could be perched on tables and within easy reach of consumers far and wide**. In our initial endeavors, we collaborated with technologies that could seamlessly tie into the blockchain, ensuring the integration of all our systems into Sensedia's robust and dependable platform. As we took our first steps into the realm of blockchain, a realization dawned – we were just a step away from creating NFTs.

It struck us that not capitalizing on the opportunity to commercialize the **"carbon credits"** we generated would be a huge waste. Consequently, we obtained the I-REC (International Renewable Energy Certificate) certification, a step that allowed us to offset individuals' carbon footprints stemming from their daily electricity consumption in their homes."

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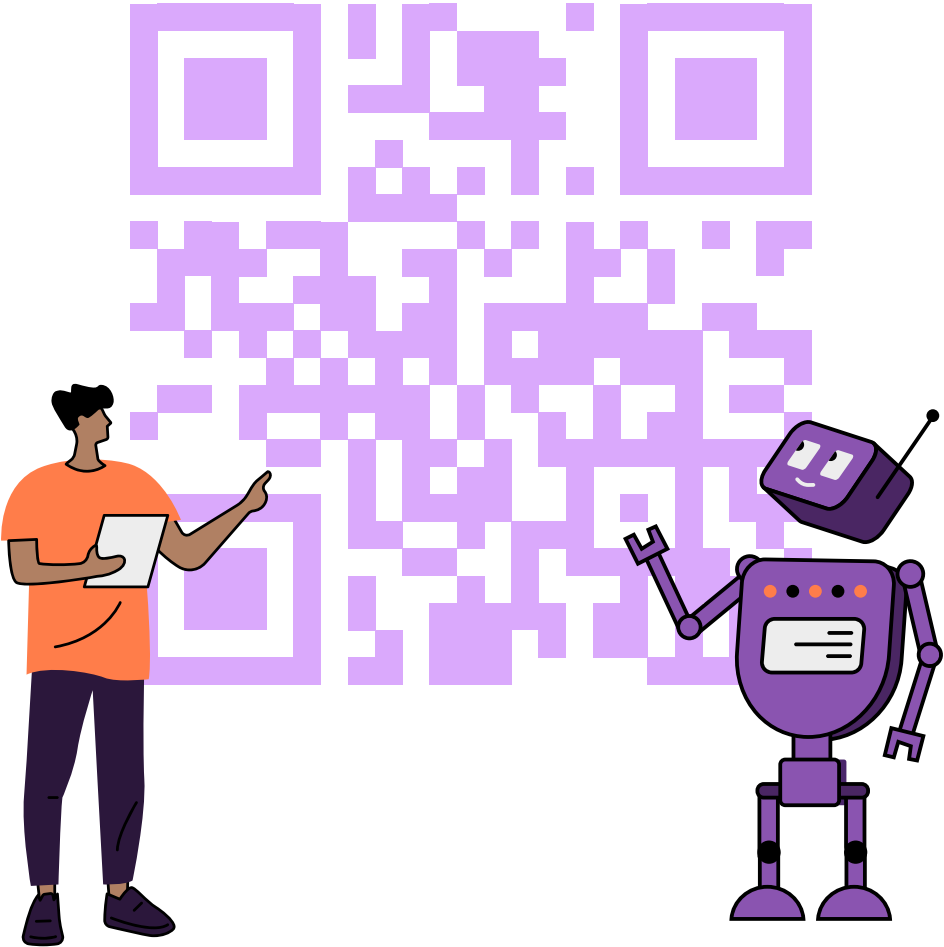
"We stumbled upon a remarkable market opportunity. People are increasingly inclined to purchase a product when they're armed with knowledge about its origins, production methods, unique attributes, and most importantly, its environmental impact and recyclability status. Today, we manage to cultivate more on the same expanse of land, **triggering enhanced photosynthesis and producing a greater volume of clean energy.** However, this achievement often goes unnoticed. The introduction of blockchain technology has changed the game – it empowers me to vividly showcase and substantiate our deep-seated commitment to sustainability and renewable practices."

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Sustainability from day one

"Approximately two and a half years ago was when this journey began. When one of our stakeholders challenged us to explore product tracking through blockchain. Meanwhile, the industry we're situated in, Mato Grosso, has been under constant scrutiny, often tainted by misconceptions. These distortions, both at home and abroad, have created a skewed perception associating our region with wildfires, deforestation, and encroachments. However, in truth, our company, with a legacy spanning 42 years, holds the distinction of being the third-largest sugarcane industrial plant globally."

Synergy with the board

"That's when we, in collaboration with our innovation team, made the call to build a blockchain and showcase our operations, processes, and our commitment to being a company fueled by **100% renewable energy and driven by innovation**. We take pride in being a force that doesn't contribute to pollution and certainly doesn't partake in any form of

"We initially presented this concept to our advisory team. I recall one member posing a question – **why would consumers be willing to pay extra for sugar simply due to traceability?** Our marketing team researched this matter through focus groups and unveiled a fascinating discovery. Consumers are willing to pay up to **30% more for a product if they can vouch for its origin**. We managed to substantiate that our sugar held a hidden value. This insight further amplified the project's appeal as it provided us with the ability to discuss margins at our advisory discussions."

"Subsequently, one of our investors posed a challenge: we hold the conviction that carbon credits are an irreversible step towards offsetting carbon footprints.

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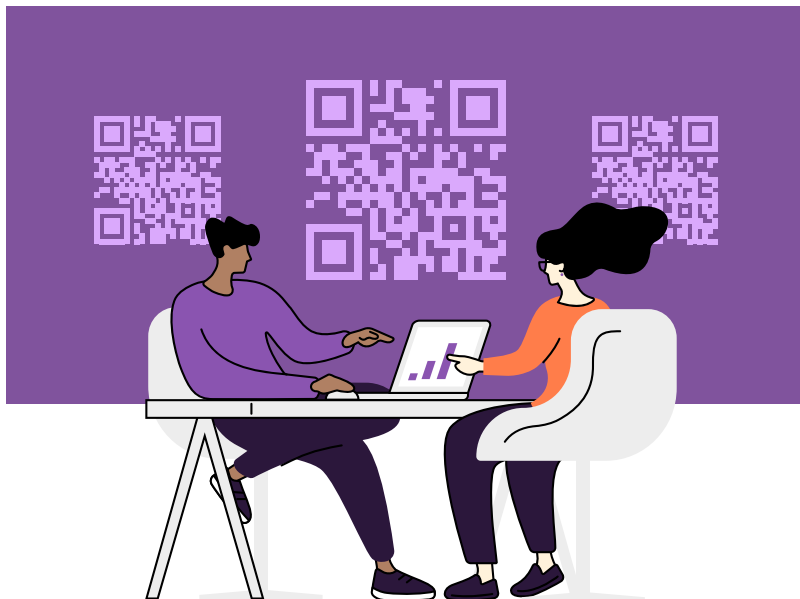
So, let's channel our efforts and resources into showcasing our commitment to erasing our carbon footprint and offer people the chance to do the same. It was the board's challenge that propelled us forward, **motivating us to develop NFTs, smart contracts, and transition our entire operation onto the blockchain**."

"Moving into the project's second phase, we resolved to infuse traceability into all our products. In fact, we're launching a fresh line of animal feed this month. This range caters to cats, fish, cattle, and more. Interestingly, our research into the reception of such products, intended for animals yet purchased by humans, yielded incredible results. The acceptance rate surpassed our expectations. We were approached by companies willing to purchase our entire production. Their motivation stemmed from the traceability aspect. **They highlighted that their customers exhibited interest in the diet of the beef they consumed, emphasizing the value of a sustainable and healthful product.**"

"When we began the NFT phase, particularly involving carbon credits, our team focused on addressing the entire chain. This entailed employing market standard metrics to calculate various links while forging partnerships with specialized enterprises for project management. The outcome? Individuals now have the opportunity to acquire carbon credits, which not only counterbalances their carbon footprint but also encourages Uisa's initiatives in social responsibility. This is facilitated through the "Florescer" project, **a community initiative that took root in 2006 and has already made a profound impact on 32 thousand individuals.** When someone purchases a credit, they receive an NFT and a certificate signifying their contribution to erasing their carbon footprint. This model is equally applicable to both individuals and organizations."

"We would like to to keep evolving the product with a strong emphasis on transparency, showcasing our positive environmental impact more effectively. Currently, we're evaluating the potential risks tied to a depletion of carbon credits. This challenge arises from the lack of a precise understanding of our national demand. Notably, **carbon credits are being sold at lower prices in Brazil compared to Europe**, owing to differing market credibility. The concerns around greenwashing and double-dipping in credit sales are valid but, in our case, the blockchain guarantees traceability and credibility. This was a key factor in our decision to adopt blockchain technology in the first place."

The technological point of view

"Our internal IT and innovation ecosystem is remarkably robust and has seen significant acceleration over the past five years. We've seamlessly integrated over 60 to 70 systems that gather automation data, including IoT integration, and a wide range of developmental systems."

"We chose to build the blockchain within a secure cloud computing environment, and in our case, we went with **Google Cloud**. As we started assembling standard templates and APIs, we realized the necessity of incorporating governmental data to ensure the accuracy of our records, perform validations, and the like.

However, we soon encountered challenges in efficiently monitoring and managing real-time activities."

"Sensedia stepped in as our dependable API reliability engine. **It played a crucial role in interconnecting all our systems and facilitating the integration with the blockchain.**"

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Integration of technology, business, and innovation

"We had to convey the significance of the entire process to everyone. Many here have been excelling at their roles for 35 years. Yet, we needed to educate about blockchain, smart contracts, and the value of integrating this data into the network and its potential impact. While many used spreadsheets and even paper to manage these tasks, all these processes underwent digitization. Naturally, it took some convincing."

"And there was fear: Would the figures we've consistently showcased to the market alter once the process is finished?" Well, they didn't. Digitalization actually validated our metrics. It triggered a deep awareness across the entire company."

"Marketing was a big ally. Our marketing team got on board with the idea of promoting blockchain technology and showing off how valuable our product is. **We weren't sure how people would react when we put a price on our premium demerara sugar with blockchain**, but to our surprise, it sold out within a month."

"We crafted an approach for kids, getting them interested to scan the QR code and see 3D images on their phones. Parents got to know about our product with blockchain technology all thanks to their kids."

The carbon footprint challenge

"This happened in April this year. We focused the launch in the Midwest, up north, and the border regions of the country – basically, all the places we cover. At first, we tested the idea of carbon footprint offsetting with folks from different parts of the country. That's when the requests to buy the sugar started rolling in. We held off on launching our e-commerce to make sure everything went smoothly, but now we're opening it up. So, customers from other areas can place orders, giving them a chance to try it out and join in on reducing their carbon footprint."

"**We crunched the numbers and found that offsetting the carbon footprint costs about 23 cents for every 100 grams of sugar.** But here's the thing: we decided not to add this cost to the product itself. Instead, we're giving customers the choice to buy the carbon credit NFT on our online platform."

"This approach helps us avoid impacting consumers, especially in places where sugar is a big part of people's diets."

"**This is still linked to the product, you use the QR code on the packaging to make the purchase.**"

"On our online platform, you can get the credit as an NFT. And here's an important detail: 1% of what you spend goes to support our Florescer Institute. Plus, you'll get exact details about the specific part of the plantation your lot comes from – the exact lot that's helping offset your carbon footprint."

"We follow global standards. When it comes to carbon credits, we've been working with Future Carbon for 30 years (they're a Brazilian ClimateTech company focused on carbon projects and solutions). We're also looking into different approaches and, together with our ESG team, **trying to grasp the changes in the market as it's still in its early stages of development.**"

Rodrigo Gonçalves
Uisa's Director of Technology and Innovation

(*) This content is a result of collaboration with The Shift, under their Marketing Services initiative.

Sensedia's role

Sensedia simplifies enterprise architecture and integrations to improve business efficiency and flexibility. Sensedia's solutions go beyond API management, working in partnership to help customers do more, faster and better with APIs, microservices and their architecture. Whether leveraging legacy systems for open innovation within a modern platform, unlocking data with agile architecture, creating new customer digital experiences or expanding business models and partner ecosystems, Sensedia empowers its clients' businesses to become more adaptable, composable and connected

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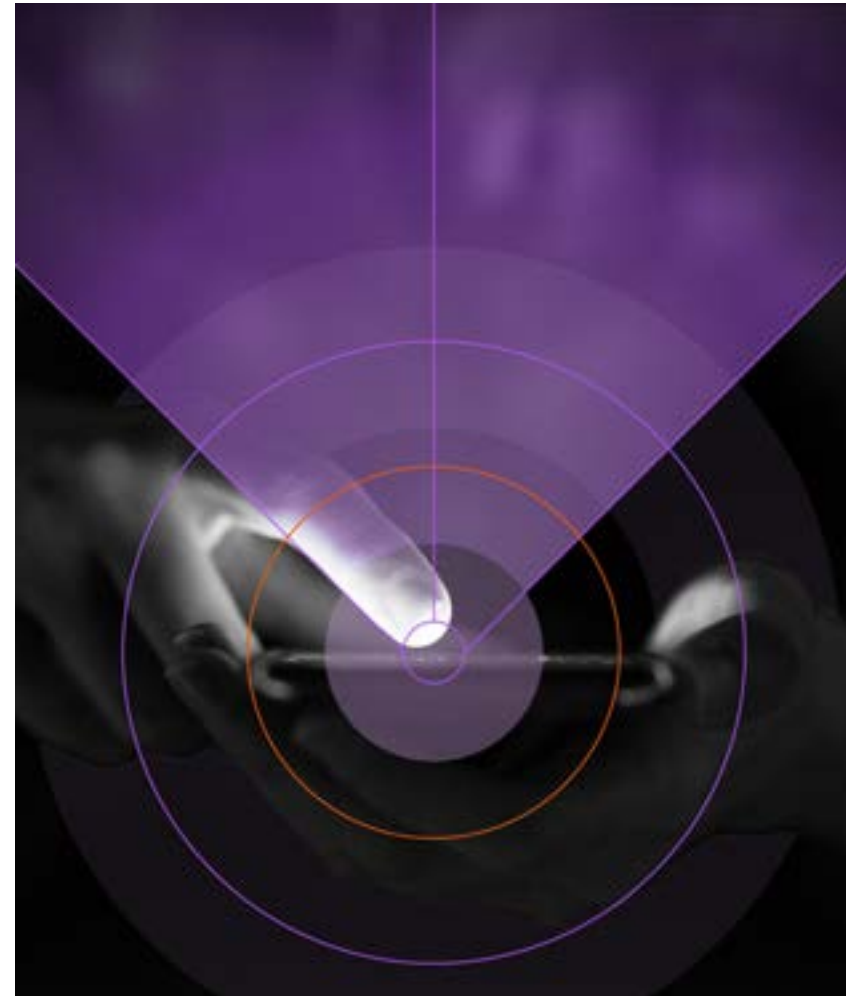
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