

Adaptation of Green IT Practices in Small Businesses with Case Study at Frut Campo in Santarém - Pará

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Abstract:

The growing need for sustainable business practices drove the realization of this study, which analyzed the implementation of Green IT at the company Frut Campo, located in Santarém, Pará. The survey explored three main axes: energy efficiency, digitization of documents and perception of sustainable certifications. Among the results, it is highlighted that 70% of the company already adopts the use of LED lamps, and 80% of the administrative documents have been digitized, showing important advances, but also identifying points to be developed. The study concludes that, even with financial limitations, small businesses can adopt sustainable practices with positive impacts both operational and environmental, as long as there is planning and internal awareness.

KeyWords: *Green IT; Corporate Sustainability; Energy Efficiency; Document Digitization; Environmental Certifications.*

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I. Introduction

The growing concern with sustainability has encouraged companies of different branches and sizes to adopt environmental practices. In the Information Technology (IT) sector, this movement is manifested through Green IT, which aims to reduce environmental impact through technology, energy efficiency, resource optimization, and waste reduction. Although large corporations have already implemented several sustainable strategies, small companies still face challenges in adopting these practices, either due to lack of knowledge or financial constraints, which can limit these companies from applying their sustainable implementations. The importance of this study lies in the fact that the adoption of Green IT in small businesses can represent not only a positive impact on the environment, but also on the operational environment of companies, since with Green IT we can reduce operating costs and increase market competitiveness, adding more visibility and confidence in their products and operations. The implementation of sustainable practices can help small businesses optimize their processes, reduce waste, and improve their energy efficiency, becoming more aligned with the growing demand for sustainable means in companies. In addition, the implementation of Green IT can contribute to the construction of a corporate image more aligned with environmental concerns in society and in the business sector, adding value to the brand and strengthening its reputation.

Another relevant aspect of this study is its ability to serve as a reference for small businesses that want to adopt sustainable practices without compromising their financial viability. This study seeks to demonstrate that sustainable solutions do not need to have a high investment or very high complexity to be adopted in the desired environment, small changes in the daily business can generate significant impacts to help managers and entrepreneurs understand the advantages of Green IT and make more consistent and sustainable strategic decisions to have greater benefits without harming the environment.

In this scenario, this article aims to make a simulation and analyze the positive impact by addressing the implementation of Green IT in the small business Frut Campo, located in Santarém PA, which operates in the food sector and seeks sustainable improvements to stand out from the others, where we will identify possible improvements that can be implemented in an affordable and sustainable way. The study focuses on aspects such as energy efficiency, cost reduction, implementation of solar panels, with returns that benefit both the environment and the company. In addition, the implementation of sustainable certifications that improve operational efficiency and strengthen the company's corporate image will be evaluated, identifying viable and affordable initiatives that can have a positive environmental, social, and economic impact.

II. Bibliographic Reference

With the advancement of technology and the increase in environmental impact caused by the industrial and technological sectors, the concern with sustainable practices has intensified. Green Information Technology (Green IT) emerges as an effective alternative to mitigate this impact, reducing energy consumption, promoting the proper disposal of electronic waste, and encouraging eco-friendly practices. One of the main differentials of Green IT is its ability to combine sustainability with business efficiency (ASCENTY, 2023).

Sustainability and Green Information Technology

Sustainability, defined as the preservation of natural resources for future generations, plays a central role in the modern business context. Sustainable practices help reduce waste, promote social responsibility, and strengthen corporate image. Corporate sustainability, according to CEBDS (2020), consists of economically viable and socially responsible actions that ensure sustainable development and compliance with environmental standards, such as ISO 14001. The concept of Green IT encompasses technological practices that aim to minimize environmental impacts through energy efficiency, equipment updating, and proper disposal. According to MJV Innovation, Green IT is not limited to technology, but implies a cultural transformation in companies, reflecting in greater competitiveness and recognition in the market.

Sustainability offers several benefits for small businesses, such as attracting customers, standing out from other companies, as well as boosting business reputation, providing a competitive advantage. It strengthens the environmental and social environment, meeting the environmental requirements requested by companies, and environmental standards such as ISO 14001 can be maintained, which is responsible for establishing an environmental management system that aims to comply with environmental laws and regulations. Sustainability also contributes to employee encouragement by helping to attract and retain talent, as many specializations can arise internally within the company. Another benefit is reduced waste and lower operating costs resulting from more efficient manufacturing processes, improved energy efficiency, and compliance with local environmental regulations. Complying with regulations is essential, as failure to comply can result in fines and damage the company's reputation. Companies with green credentials become more attractive to investors. As quoted in the magazine (BRITISH BUSINESS BANK, 2025). The need to be more sustainable drives innovative ways of working, generating new processes, products and alternative markets, to increase operational efficiency.

Sustainable Strategies in Green IT

Sustainable tactics in Green Information Technology (Green IT) include actions that seek to lessen the environmental impact of business activities through the effective use of technology. Such measures not only foster environmental sustainability, but also improve the internal resources of companies, helping to reduce operating expenses and strengthen corporate social and environmental responsibility. Below, some of the main strategies that can be implemented in small businesses in the context of Green IT will be addressed.

Document Scanning

Organizations need to enable technologies to reduce paper usage and shift to digital workflow processes. Digitalization is the necessary first step on the path to pure digital. It is important for organizations to digitize paper records to truly create a paperless environment going forward. Daily scanning strategies are necessary to eliminate paper entirely, where all new records from a selected date will be digitized and the company will no longer keep paper records. Scanned records are usually stored in a new, more efficient document management system. In both cases (backfile conversion and next-day scanning), scanning is used for document digitization, to achieve digital transformation goals (KODAK ALARIS, 2021). According to the article published in (Eval Digital, 2022), the advantages of using digital documents are many. Among them, we can highlight.

- Storing documents on a cloud server allows employees to have access to information whenever they need it, regardless of the device used (computer, cell phone, or tablet). The documents are protected against loss, theft or robbery in addition to being super organized.
- The quick search for information is another benefit of using digital documents. With documents organized into virtual folders and indexed by keywords, it is possible to quickly find what you want to know without having to search one by one.
- Data security is a key aspect in the information age. With documents stored on servers, the chances of information leakage are reduced considerably, making everything safer and more efficient and with less spending on paper or degradable materials.
- Finally, operational costs can be significantly reduced with the use of digital documents. Paper printing consumes a significant amount of office inputs. Nowadays, this is no longer necessary, as all documents can be printed directly from the computer.

Energy Efficiency

Energy efficiency is one of the most discussed topics when we think about Green IT, its concept consists of ways of generating and using energy that can make the least use of natural and financial resources. Its objective is to avoid waste as much as possible, so that equipment uses only the energy necessary for its operation, from an electric light bulb to entire industrial facilities. And for it to be used more efficiently, equipment that performs well is required, that is, it uses less electricity to generate the same amount of useful energy compared to similar ones (POTENCIALIZEE, 2023). Energy efficiency is a crucial factor within small businesses, as it can reduce operating costs while minimizing environmental impacts. Unlike large companies that most of the time have a larger budget to be invested in sustainability, small companies need to adopt ways to apply sustainable solutions without compromising their financial budget.

Use of Biomaterials

Biodegradable products are those that have the ability to decompose naturally in the environment or through the action of microorganisms such as bacteria and fungi that are present in the soils. These products are easily decomposed and return to the environment naturally without having any type of aggravating factor for the environment, unlike materials such as plastic or glass. Biodegradable products bring several advantages to companies, such as reducing waste disposal costs, improving the company's corporate image, meeting demands for sustainable practices, and contributing to the environment by avoiding pollution and manipulation of ecosystems (I PROPOSE, 2025). The implementation of biodegradable packaging is currently taking place even in the food sector, not only due to disposal issues, but also due to the growth in the number of consumers demanding issues related to the environment and their consumer products (KOZIK, 2020). Therefore, even with such a trend, knowledge about what biodegradable packaging is or its difference compared to other types of packaging are still not very well defined issues among people (TAUFIK, 2020). Even so, the search for materials with less environmental impact is still in force.

Corporate Sustainability Certifications and Standards

The so-called green certifications, also known as green seals or ecoseals, endorse the company that follows rules, standards, measures, guidelines and procedures aimed at obtaining an optimal degree of order in a socio-environmental context. In other words, a green certification ensures that that company has a real environmental management, which brings effective results in protecting the environment (LEMAAMBIENTAL, 2021).

The implementation of sustainable practices can be enhanced through environmental standards and certifications, which establish guidelines to ensure energy efficiency, reduction of environmental impacts, and sustainable management of technological resources. Among them, we can highlight ISO 14001, which helps the company reduce the environmental impact of its operations, improves compliance with environmental laws and avoids fines, LEED certification and suitable for companies that want to make their structure more sustainable, reduces water and energy consumption in the production and storage environment, which ends up helping small companies that are starting their development and want to have a more sustainable environment without excessively spending their financial resources that bring more quality to their products and operations, using only what is necessary in their day-to-day operations.

III. Methodology

This study used a qualitative, exploratory and descriptive approach to analyze the implementation of Green Information Technology practices in a small business in the food sector. The methodology chosen was the case study, allowing an in-depth analysis of the organizational reality. The research was limited to the company Frut Campo, located in Santarém, Pará, with consolidated operations in the manufacture of fruit pulps. For data collection, the technique of semi-structured interviews was adopted in a virtual way, complemented by the analysis of institutional documents provided by the company. The interview participant was selected based on accessibility and knowledge of the organization's internal processes. The interview script was structured in such a way as to allow open and flexible answers, addressing topics such as energy efficiency, document digitization and sustainable certifications, with the objective of building a diagnosis that would make it possible to propose practical and sustainable improvements to the business environment.

The data analysis will be done through the triangulation of the information obtained in the interviews and in the institutional documents, seeking to increase the validity of the results. For logistical reasons, face-to-face interviews were not feasible, limiting direct observation of internal processes; This limitation will be mitigated by the detailed recording of the information collected. The research will respect the ethical principles established by Resolution No. 510/2016 of the National Health Council, ensuring the confidentiality of the data and the free and informed consent of the participant. Despite the limitations regarding the generalization of the

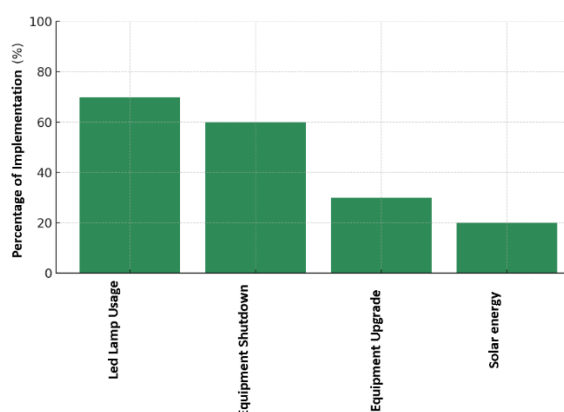
results, the study aims to offer theoretical and practical subsidies to other companies of similar size and sector, encouraging the adoption of accessible and viable sustainable practices.

IV. Results

The analysis of the data collected from the semi-structured interview and the documentary analysis of the company Frut Campo allowed the identification of opportunities for improvement related to the adoption of sustainable practices of Green Information Technology. Based on the information collected, three main axes of energy assessment and efficiency, digitization of documents and perception of sustainable certifications were elaborated. Next, each axis will be presented with its respective results, illustrative graphs and interpretations of the data, enabling a clear understanding of the advances and challenges encountered.

Energy Efficiency at Frut Campo

Energy efficiency was one of the most relevant aspects observed at Frut Campo. Currently, the company already adopts basic energy-saving practices, such as the use of LED lamps and the shutdown of equipment outside of office hours. However, it was identified that there are still opportunities for improvement, especially in the modernization of processing equipment and the use of alternative energy sources, such as the installation of solar panels. Employee awareness was also pointed out as an important factor for the success of Green IT practices.

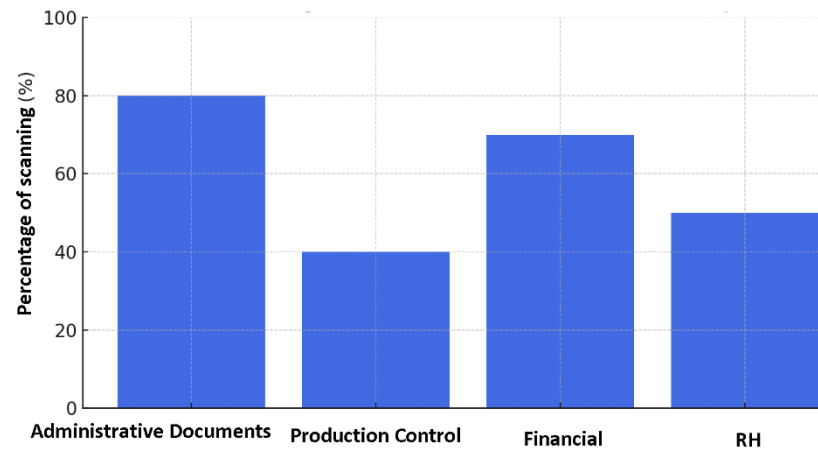


Graph 1. Energy Efficiency Practices in the Company
Source: Authors, 2025

Graph 1 shows that simple practices, such as the use of LED lamps (70%) and the shutdown of equipment (60%), are already prioritized at Frut Campo. However, practices that require greater investment, such as updating equipment (30%) and adopting solar energy (20%), still have low implementation. According to Oliveira and Souza (2021), energy efficiency in small businesses depends directly on the awareness of managers and the feasibility of accessible technologies. This data reinforces the need for progressive investments and internal awareness programs.

Document Scanning Level

The digitization of documents is an essential strategy to reduce paper consumption and increase agility in internal processes. The company Frut Campo already carries out some digitization practices, but still uses, in most of its processes, physical records, especially in production control and administrative sectors. The survey showed that the company recognizes the benefits of digitalization, but runs into cultural resistance and lack of employee training.

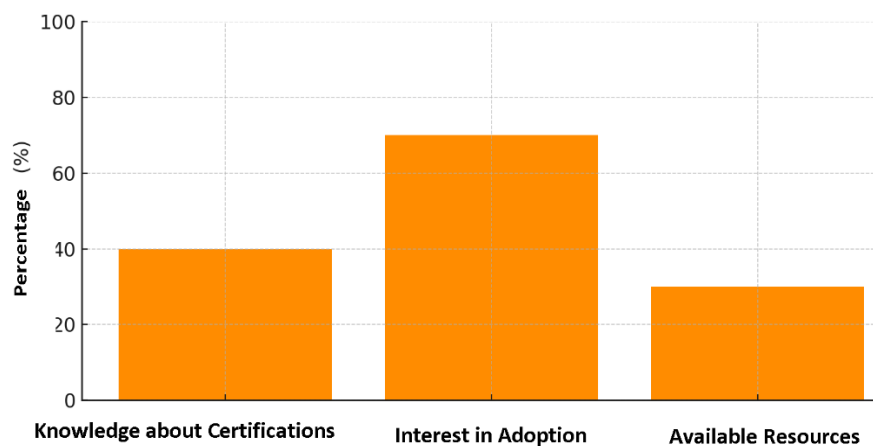


Graph 2. Document Digitization at Frut Campo
Source: Authors, 2025

It is observed that digitalization is more advanced in administrative (80%) and financial (70%) documents, while the production control sector (40%) and HR (50%) still have a significant dependence on paper. As Cruz and Lima (2022) point out, digitalization is not only a technological change, but also a cultural one, requiring continuous training and review of internal processes. Frut Campo demonstrates that it is on the right track, but it still needs to expand digitalization to all sectors in an integrated way.

4.3 Perception of Sustainable Certifications

The adoption of environmental certifications is seen as a competitive advantage for small companies that want to reinforce their sustainable image in the market. At Frut Campo, the perception of the importance of certifications, such as ISO 14001 or sustainability seals, is still in its early stages. The survey revealed that while the company recognizes the strategic value of these certifications, there are limitations in the technical expertise and resources to implement them in the short term.



Graph 3. Interest and Knowledge about Sustainable Certifications
Source: Authors, 2025

The graph shows that interest in the adoption of sustainable certifications is significant (70%), but technical knowledge (40%) and financial resources (30%) are still obstacles. As Pires and Andrade (2020) state, the search for environmental certifications must be strategically planned, considering the structural limitations of small organizations. Thus, it is observed that, although there is a positive intention, it is necessary to invest in training and seek partnerships to enable the implementation of certifications at Frut Campo.

V. Conclusion

The study carried out at the company Frut Campo demonstrated that, despite the financial and structural limitations typical of small companies, it is fully possible to advance in the implementation of accessible and high-impact sustainable practices. The analysis of the energy efficiency axes, digitization of documents and sustainable

certifications revealed that simple actions, such as the adoption of LED lamps and the digitization of administrative documents, already generate positive results both in the environmental and operational aspects. However, challenges still persist, especially with regard to the modernization of equipment and the search for environmental certifications, indicating that, although there is a growing awareness, it is necessary to consolidate an organizational culture more focused on sustainability, with progressive investments and continuous training of employees.

Green IT, in this context, proved to be a powerful ally for the optimization of internal processes and for the improvement of Frut Campo's corporate image. By incorporating sustainable practices gradually and strategically, the company can reduce waste, cut costs, and strengthen its competitive position in the market. More than a matter of obligation, sustainability presents itself as an opportunity for growth and differentiation for small businesses. Thus, this study reinforces the idea that simple changes, aligned with conscious planning, are capable of producing significant transformations, generating benefits that go beyond the internal environment of the organization and contribute to a greener and more innovative business future.

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