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ANALYSIS OF OPERATING SYSTEMS BLOCKCHAIN EQUITY CROWDFUNDING SCHEME ON ECOSYSTEMS RENEWABLE ENERGY BUSINESS IN INDONESIA

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ABSTRACT

The high initial investment value, which is comparable to fossil technology, is the key hurdle to the growth of renewable energy technology in Indonesia. The purpose of this project is to create a business model canvas for the utilization of renewable energy technology in conjunction with an Indonesian blockchain equity plan. This research is qualitative in nature since it uses direct interviews with respondents, direct observation of company activities, and secondary data from a range of sources to augment data from respondents. The researchers surveyed ten people from the blockchain and renewable energy industries. The analysis entails entering data from many sources into nine blocks of the Business Model Canvas (BMC), which then assesses the Strength, Weakness, Opportunity, and Threat of each block. It is envisaged that the findings of this study would be utilized to establish business strategies for organizations looking to adopt a blockchain equity crowdfunding scheme in the renewable energy company, as well as to offer investors and consumers' confidence to invest in the renewable energy business ecosystem.

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1. INTRODUCTION

The influence of numerous factors, such as population expansion, economic growth, and sustainable technical improvements, can be seen as increasing the demand for energy supply in Indonesia (Pricewaterhouse Coopers, 2017). Massive energy demand and concern for sustainable development prompted the Indonesian government to set a target for the contribution of new and renewable energy (EBT) to the final energy mix, as defined in Government Regulation No. 79 of 2014 and the National Energy General Plan.

The usage of fossil energy sources in Indonesia will encounter a variety of challenges, including rising pricing, increasingly complex energy distribution routes, and increasingly severe weather, climatic, and environmental consequences. One answer for current and future energy supply is to use renewable energy sources as much as feasible. This indicates that renewable energy will be critical for the growth of electrical energy in rural parts of Indonesia, which are distributed throughout many islands and archipelagos, because these sources can be selected and processed from local potential.

The biggest barrier to the use of renewable energy is a lack of community understanding of different factors, both technical and economic, as well as the characteristics of renewable energy sources, which are site specific, variable, and intermittent. Many countries throughout the world have introduced cryptocurrency schemes such as Blockchain, which are used as an alternative for investing in renewable energy technology. This is done to make it easier for people to enjoy renewable energy sources in rural areas and to entice metropolitan groups to invest.

Blockchain is a future technology that has the potential to profoundly alter the way electricity is marketed and used. Blockchain promises a transparent, tamper-resistant, and secure technology that can enable new business solutions, particularly when integrated with smart contracts (Andoni et al., 2019). Because of these characteristics, blockchain may be a promising solution for the control and management of future increasingly decentralized and complex electricity markets and networks, providing an effective, efficient, and cost-effective means of integrating inexpensive and large-scale Renewable Energy Sources (RES) for all market participants (Iansiti & Lakhani, 2017).

Blockchain technology (BCT) was initially revealed in 2008 as the fundamental concept of the digital currency Bitcoin, which was invented by an anonymous programmer under the pseudonym Satoshi Nakamoto. Bitcoin initially failed to gain traction, leading many to distrust this new currency. The blockchain runs as a network (nodes), which means that each node has the same decentralized chain to the database. Transparency, transfer effectiveness and efficiency, safety, and, most crucially, having a fixed or inelastic amount in each transaction are the primary benefits of building a blockchain scheme. However, certain parties are opposed to the use of blockchain (Yli-Huumo, Ko, Choi, Park, & Smolander, 2016).

Because cryptocurrencies have no intrinsic value or underlying assets, they are vulnerable to electronic theft when utilized in transactions. They're also widely utilized in criminal operations including money laundering, drug trafficking, and terrorism. Because of these conditions, central banks in a number of countries, including Indonesia, have declared cryptocurrencies illegal and made storing them impossible. Nonetheless, a number of governments, including Japan, the United States, Denmark, South Korea, Finland, and Russia, have begun to acknowledge the existence of this cryptocurrency. As a result, the position of crypto currency in the world of finance is becoming increasingly phenomenal.

Because this technology has the ability to integrate unbanked people all over the world into the contemporary financial system, cryptocurrencies have become an appealing component of the banking and investment industries. Fundamentally, many central banks throughout the world will be concerned about this in the future. The disruptive era is the third of six exponential development phases (Diamandis & Steven Kotler, 2016). These six phases explain the crypto currency phenomenon well: analog to digital transformation (digitalization), deceptive growth doubling growth that appears small at first when technology is still in its infancy (deceptive growth), disruptive growth doubling small technology growth, resulting in large growth that disrupts or even kills others (disruptive growth), technology and services move from expensive to free (dematerialization), once technology becomes divisible (democratization).

This study seeks to identify and assess the factors present in consumer segments, value propositions, channels, customer connections, income streams, key activities, critical resources, and so on.

key partners, dan cost structure agar dapat menentukan bisnis renewable energy dengan skema blockchain serta Mengetahui dan menganalisis pengaruh proses Business Model Canvas (BMC) dengan konsep blockchain terhadap proses bisnis dari perusahaan.

The concept of renewable energy technology arose in the 1970s as an attempt to counteract the rise of nuclear and fossil-fueled energy. According to Ellabban, Omar, et al. (2014), renewable energy frequently supplies energy in four essential areas: power generation, heating/air and water cooling, transportation, and other rural energy services. In these four major categories, Indonesia has significant renewable energy potential. Traditional grid systems can already be replaced by renewable energy systems to supply the constantly rising demand for electrical energy.

As global climate change worsens year after year, scientists in the power industry compete to create innovative ways to replace existing electricity infrastructures. Renewable energy development is one of the seven national priorities, and it is featured in one of the national research agendas. A smart grid, according to the United States Department of Energy (DoE), is an integration of sensing technologies, control methods, and communication at existing energy. Satoshi Nakamoto created the blockchain in 2008, and it serves as a database for public bitcoin transactions. A blockchain is a record that is linked and secured using cryptographic techniques. Blockchain is an open distributed ledger that can record all transactions between two parties quickly and permanently.

Blockchain was designed with the objective of making the system run securely (safe by design) and is an example of a distributed computing system with high Byzantine Fault Tolerance (BFT). Blockchain technology has the ability to significantly alter the operating business model in the long run (Raval, 2016). Enterprises are hesitant to include blockchain into their essential company structure; this is done by businesses to limit or prevent various forms of hazards. Blockchain technology enables businesses to employ novel ways in all digital transaction processes (Cheng, 2017).

2. METHOD

The researchers employed qualitative research methods in this study. The data used in qualitative research is unstructured and non-numerical. According to Wertz, Charmaz, and McMullen (2011), the basic paradigm of current qualitative research originates from a number of key philosophical fields, including positivism, postpositivism, critical theory, and constructivism.

Because the researcher considered the problems under study to be exceedingly multifaceted, dynamic, and prone to new concerns, the data gathered from the informants was captured using a more natural method, namely direct interviews with the informants to obtain natural answers. The goal of this

study is to identify changes in work systems that can occur both internally and externally in the business model canvas (BMC) in order to assess the impact of deploying blockchain schemes on the renewable energy business ecosystem.

After identifying changes in BMC's internal and external work systems, researchers will conduct a SWOT analysis, focusing on the business process sector. SWOT analysis seeks to identify an organization's strengths and weaknesses, as well as its ability to adapt to changes in the business environment (Kalpande et al., 2010). SWOT analysis can be used to assess a company's business model. The primary data sources for this study are blockchain associations in Indonesia, private companies as renewable energy businesses, PT. PLN (Persero) as the sole player in the Indonesian electricity business, government policymakers, specifically the Ministry of Energy and Mineral Resources, and members of the general public who have and have not used renewable energy.

2.1. Delphi Engineering Analysis Technique

The Delphi Method is a planning strategy that involves gathering numerous expert perspectives. This tactic can also be viewed as a method of detecting and forecasting breakthroughs and other new opportunities. This strategy is widely employed by entrepreneurs to forecast developments that may have an influence on their firm (Lumbaturuan & Suwartoyo, 1992). The purpose of this strategy is to generate a number of alternative plans. Investigating the assumptions or facts that underpin specific "judgments" in order to reach an agreement. This process often begins with a generalized problem that is then narrowed down to a more particular problem.

2.2. Data verification

The member check technique is also used to evaluate external validity and transferability. If the reader has a clear picture and comprehension of the research context, the research is regarded to have a high level of transferability. The degree of correctness or relevance of the research findings to the population from which the sample was drawn is referred to as external validity. The Delphi Method seeks consensus or convergence of opinion in order to determine whether existing instruments should be developed. The current instruments have converged or an agreement has been reached among informants who consider that developing them using statistical analysis is necessary.

3. RESULTS AND DISCUSSION

Questionnaire and Response Distribution To find out what respondents thought about the research, questionnaire data was collected in three stages (stages 1, 2, 3).

3.1. Respondent Variable

The varied responses of respondents acquired via the interview approach are examined based on predetermined categories in the distribution of respondents' answers.

3.2. Variable customer segments

Based on the Customer Segment questions, respondents explained who may use blockchain and renewable energy, and the researchers also gave explanatory questions on what characteristics users of the two products must have. Respondent 1 asserted as a blockchain actor, "From the upstream side, the general people would be able to make investments that will be implemented in rural communities in their agricultural and plantation sectors." (Personal Interview, October 29, 2020, Respondent 1). According to the statement, the Customer Segments variables included in this system are the general public, rural communities, and farmers. Furthermore, another respondent who is also a blockchain actor noted, "The general public can make transactions utilizing renewable energy that is integrated with the blockchain." (Personal Interview, October 29, 2020, Respondent 2). The sentence explains that the Customer Segments variable in this system is the whole public.

3.3. Variabel Value Propositions

Based on the Value Propositions questions, respondents stated their comprehension and benefits of blockchain and renewable energy; also, the researchers gave explanatory questions regarding what elements could influence a person's decision to purchase these two items. Respondent 1 from blockchain actors claimed that "transparent approaches should be employed for the medium of exchange." (Personal Interview, October 29, 2020, Respondent 1). The statement explains that the Value Propositions variables involved in this system are transparency and exchange rates. Furthermore, another person who works in

the renewable energy industry noted that "the blockchain system can be an exchange rate and mutual selling and buying" (Respondent 4, Personal Interview. 2020, October 31). The statement explains that the Value Propositions variable in this system is energy sales transactions. Another general public respondent stated, "if we look at the initial investment, it was fairly big... innovation in terms of security mechanisms." (Personal Interview, October 30, 2020, Respondent 10). The statement explains that the Value Propositions variables involved in this system are investment and security.

3.4. Variabel Channels

Respondents to Channels questions mentioned how clients might learn about the products provided. Furthermore, experts are concerned about how the product will be distributed to customers. Respondent 1 claimed as a blockchain actor, "Blockchain itself employs the main channels through online, namely websites and social media." (Personal Interview, October 29, 2020, Respondent 1). The Channels factors employed in this approach, according to the statement, include internet, website, and social media. Furthermore, another respondent, who is a blockchain actor, noted, "The establishment of a network. We are currently submitting an online application." (Personal Interview, October 29, 2020, Respondent 2). The sentence explains that the Channels variable is an application in this system. "I have renewable energy at home and everything is purchased online at the marketplace," claimed another member of the general public. (Interview with Respondent 10 on October 30, 2020). The Channels variables engaged in this system, according to the statement, are marketplaces and digital media.

3.5. Variabel Customer Relationships

Respondents explained how to interact with blockchain users and renewable energy users in response to questions about Customer Relationships. Furthermore, researchers inquired about methods to ensure that buyers are delighted with the two products. As a blockchain actor, Respondent 1 stated, "via websites, seminars, social media, community meetings, networking among friends, and direct personal contacts." (Personal Interview with Respondent 1, October 29, 2020). According to the statement, the Customer Relationships variables in this system are websites, seminars, social media, communities, and direct encounters. Aside from that, another blockchain actor noted, "the blockchain association from there has developed to conduct education with many parties on the website and social media." (Personal Interview with Respondent 2, October 29, 2020). According to the statement, the Customer Relationships variables engaged in this system are associations, communities, websites, and social media. "We will all lead to online applications," remarked another respondent from the general public. (Personal Interview with Respondent 10, October 30, 2020). According to the statement, the Customer Relationships variable in this system is an online application.

3.6. Variabel Revenue Stream

In response to questions about the Revenue Stream, respondents emphasized how blockchain and renewable energy firms may make money. Respondent 1 stated that as a blockchain actor, "the blockchain architecture allows for incentives and costs for mining that occurs." Personal Interview with Respondent 1 (October 29, 2020). The Revenue Stream variable in this system, according to the statement, is fee mining. Another blockchain participant added, "Profits can be gained through the share profit of the firm that arises." Personal Interview with Respondent 2 on October 29, 2020. The Revenue Stream variable in this system, according to the statement, is share profit. Another general public respondent responded, "Companies will profit from the sale of their products." (Personal Interview with Respondent 10, 30 October 2020). The text explains that the Revenue Stream variable in this system is the tool sale.

3.7. Variabel Key Activities

Respondents indicated what activities they carried out in selling their items based on the Key Activities questions they were asked. As a blockchain actor, Respondent 1 indicated that "activities are still tied to teaching and minor experiments in numerous areas." (Personal Interview with Respondent 1, October 29, 2020). The statement explains that education is the Key Activities variable in this system. As a blockchain actor, Respondent 1 indicated that "activities are still tied to teaching and minor experiments in numerous areas." (Personal Interview with Respondent 1, October 29, 2020).

The statement explains that education is the Key Activities variable in this system. Furthermore, another blockchain actor stated, "The stages of introduction and education must continue to be carried out so that people are more familiar with this blockchain phrase." (Personal Interview with Respondent 2, October 29, 2020). The statement explains that education is the Key Activities variable in this system.

Another general public respondent stated, "really, it is simple to do field installations." (Personal Interview with Respondent 10, October 30, 2020). According to the statement, the Key Activities variables involved in this system include field installations.

3.8. Key Resources is a boolean variable.

In response to Key Resources questions, respondents stated what resources are required to carry out business activities in the blockchain and renewable energy sectors. Respondent 1 stated that "HR understands the world of IT, security systems, and business and investment management" as a blockchain player. (Personal Interview, October 29, 2020, Respondent 1). According to the statement, the key resources engaged in this system are IT, business management, and investment management. Another respondent, who is also a blockchain actor, added, "from an IT technology innovation standpoint that can then develop systems and handle new business schemes from existing firms." (Personal Interview, October 29, 2020, Respondent 2). According to the statement, the Key Resources factors involved in this system are IT and business management. Another general public respondent indicated that the region "needs local employees who must be empowered." (Personal interview with Respondent 10, October 30, 2020). The statement underlines the importance of local workers as Key Resources factors in this system.

3.9. Variable Partners

Based on questions concerning Key Partners, respondents mentioned who was involved in commercial operations related to blockchain and renewable energy. Respondent 1 stated that as a blockchain actor, "the regulator, in this case the OJK, must also interact with multiple stakeholders, both federal and local governments." (Personal Interview, October 29, 2020, Respondent 1). According to the proclamation, the key partners in this system are OJK, the national government, and the municipal government. Aside from that, another blockchain actor stated, "the central government, in this case the OJK, sends more indicators to the blockchain enterprise." (Personal Interview, October 29, 2020, Respondent 2). According to the announcement, the Key Partners are involved in this system are OJK and the Central Government. Another general public respondent indicated that the region "needs local employees who must be empowered." (Personal interview with Respondent 10, October 30, 2020). The statement underlines the importance of local workers as Key Resources factors in this system.

3.10. Variabel Cost Structure

Based on the Cost Structure questions, respondents stated what expenses were required to carry out company activities in the fields of blockchain and renewable energy. Respondent 1 claimed as a blockchain actor, "the regulator, in this example the OJK, must also collaborate with various parties, both the federal government and local governments." (Personal Interview, October 29, 2020, Respondent 1). The declaration says that the Key Partners factors involved in this system are OJK, central government, and municipal government. Aside from that, another respondent who is also a blockchain actor noted, "the central government, in this case the OJK, gives more indicators to the blockchain company." (Personal Interview, October 29, 2020, Respondent 2).

The declaration indicates that the Key Partners factors involved in this system are OJK and the Central Government. Another respondent who was also from the general public noted "coordinating with various stakeholders, especially the local government. If you live in a big city, you will almost certainly utilize an off-grid system, and you must obtain authorization from PLN." (Personal Interview, October 30, 2020, Respondent 10). The declaration indicates that the Key Partners variables involved in this system are local government and PLN.

3.11. Analisis SWOT

An analysis was performed on internal and external parties from renewable energy business actors using an equity crowdfunding scheme, in conjunction with the researchers' SWOT analysis, to determine the strengths, weaknesses, opportunities, and threats at each stage of the BMC development that was formed. With the incorporation of blockchain as a business strategy from renewable energy, new internal strengths can emerge, such as: Users are offered the choice of implementing a scheme if their initial expenditure is restricted. There is an investment system that is transparent, accountable, and secure. A certain location has exchange rate-based productivity. However, incorporating blockchain as a business strategy from renewable energy can bring internal issues such as: Business concepts and processes are growing more complex. Business processes cannot function without adequate internet access. The company's reliance on installed tools (hardware and software) will grow. On the other hand, using

blockchain as a business approach for renewable energy can offer up new choices from outside sources, such as: Communities will be able to act as investors specifically for a specific project, Through a yield exchange program, they will be able to penetrate the agro-industrial business sector. Technology has the potential to be widely adopted in underserved communities, particularly in rural areas. Market access is rising, particularly for millennials wishing to invest long-term. Collaborating with key partners at the national and regional levels is simple.

Increasing potential will also add to the external challenges or difficulties that may occur if blockchain becomes a commercial strategy for renewable energy, such as: Legal constraints will become more complex and must be observed in their entirety. Many people are still unprepared to deal with the long-term issues of the digital investment era.

3.12. Validation of data

This study employs two types of validation: internal validation and external validation. After the researchers had typed down the results of the interviews into the data tabulation, the respondents used the member-checking technique to internal validate the study data. The researcher then categorized the data that comprised the outcomes of the interviews as they were, which he then interpreted based on his understanding of the results of the interview with the respondent. Furthermore, the results of the data tabulation were communicated to the respondents so that they were aware of the researcher's interpretation. If the researcher's interpretation yields results that contradict the respondent's intentions expressed during the interview, the respondent has the right to request that the researcher correct them. If the responder agrees with the results of the researcher's interpretation, the respondent can provide a member check on the results of the research data tabulation, and the respondent signs it as confirmation of the data's validity.

4. CONCLUSION

Conclusion It can be concluded in this study based on the findings of the preceding chapters' investigation and debate. The following are some of the study's conclusions: According to Pfeiffer, the Delphi technique uses different evaluations at each level to attain an agreement; in stage 2, this technique achieves a consensus of 66.7%, while in stage 3, it achieves a consensus of 100%. The general public (cities and towns, housing developers, productive regions (agricultural, plantations, livestock, aquaculture, and tourism), 3T areas (remote locations), industrial companies, and commercial companies are customer segments of the renewable energy sector using the blockchain scheme.

The value propositions for the renewable energy industry using the blockchain scheme are transparency, accountability, economic sharing, trust, security, investment, direct transactions, sustainability, green energy, exchange rates for each transaction, and the ability to replace fossil energy. Renewable energy business channels that use the blockchain scheme include online platforms (websites, social media, market places, and applications), offline platforms (branch offices, agents, and retail), call centers, and regional communities. Direct connection, online platforms, offline platforms, community building, mentoring, and education are all ways to build client relationships in the renewable energy industry using blockchain systems. Sales of system equipment, transaction differences, mining fees, sharing profits, installation services, and crop sales are all revenue streams for renewable energy businesses employing a blockchain scheme.

Marketing, outreach (campaigns), fundraising, operations, field installations, mentoring, education, and maintenance are critical activities for the renewable energy firm using the blockchain scheme. Staff professionals (electronics, machines, information technology, marketing, and finance), freelance technicians, and local technicians are critical resources for a blockchain-based renewable energy business.

Manufacturers of electronic components and machines, solar panel manufacturers, PT. PLN, OJK, banks, Central Government, Local Government, Ministry of Energy and Mineral Resources, Ministry of PUPR, BUMDes, communities, and housing developers are key partners in the renewable energy business using the blockchain scheme. The cost structure of the renewable energy business using the blockchain scheme includes the purchase of system devices, the purchase of database servers, the payment of employee salaries (electronics, machinery, IT, marketing, and finance), transportation, office rent (ATK, electricity, and water), tax costs, and maintenance costs.

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