Digital Collaboration Network for Coffee Marketing Based on an Agroforestry System for Economic Recovery of Coffee Farmers in Bandung Regency, West Java

Pathmi Noerhatini[1](✉), Amanna Dzikrillah Lazuardini Luqman Al Hakim[2], and Alvin Trianto Atmojo[1]

[1] Bandung Institute of Technology, Bandung, Indonesia
pathmi@itb.ac.id
[2] Nusa Putra University, Sukabumi, Indonesia

Abstract. In the fourth industrial revolution dimension, digital transformation requires the creation of a "digital collaboration network" (DCN) among stakeholders. This collaborative network aims to strike a balance between competition and sharing, benefiting all parties involved. MSMEs in Indonesia, particularly in the batik business, have embraced DCN and developed a digital community and a new business model that are crisis resistant. However, there has been no report on the DCN application for coffee commodities. The research was conducted from May to November 2021 in Bandung Regency, West Java. This research aimed to understand the application of DCN technology to coffee farming in agroforestry-based coffee growing techniques. The primary goal of this program is to understand a digital community for coffee marketing based on data from the Tenjolaya Forest-Village Non-governmental Organization, consisting of three main networks: ICT, knowledge, and social networks. Coffee farmers could communicate and interact virtually, and this network was also particularly effective in raising their income during the COVID-19 pandemic. Furthermore, coffee producers can strengthen their position in the coffee supply chain by engaging in digital marketing, which allows them to connect with buyers directly.

Keywords: digital collaboration network · coffee farmer · coffee marketing · economic recovery · agroforestry

1 Introduction

1.1 Background

Some coffee farmers in Bandung Regency (Indonesia) are members of the Forest Village Non-organization (FVNO), which cultivates coffee under forest tree stands in an agroforestry system. One of the FVNOs, namely Tenjolaya, has 313 members, who experience communication barriers between members and leaders. Apart from that, the management is less able to know how the conditions of coffee plantations in the field,

H. Nuriman et al. (Eds.): CODH 2022, ASSEHR 712, pp. 50–55, 2022.
https://doi.org/10.2991/978-2-494069-69-5_6

coffee fruit harvest, quality of coffee cherries, stock of coffee cherries processed in the form of green beans, and roasted coffee differ. Based on this data, the management has not been able to determine a strong position in the existing coffee supply chain in the area. Limited communication, knowledge, and conventional marketing methods have further reduced the income of coffee farmers during the COVID-19 pandemic.

One of the efforts to overcome this problem is to use digital transformation, which includes the adoption and integration of various new information and communication technologies for the development of more efficient, flexible, and sustainable solutions for industrial systems (Camarinha-Matos et al., 2019). Based on the research, this process also involves new organizational forms and leads to new business models. This digital transformation requires a digitally collaborative network (DCN) among stakeholders in the dimension of the 4th industrial revolution. The purpose of establishing this collaborative network is to balance competition and sharing, which will bring many benefits to the creation of a profit strategy between the collaborating parties (Fachrunnisa et al., 2012). The advantage of the rapid growth of the internet, resulting in the implementation of collaboration through the WWW (World Wide Web) platform, will transcend the limitations of time and place, as well as expand the spectrum of collaboration (Danuri, 2019). MSMEs (Micro, Small and Medium Enterprises) in Indonesia, especially the batik industry, have taken advantage of DCN, and have created a digital community, a new and crisis-resistant business model.

1.2 Digital Community

Collaborative networks take many forms, including virtual organizations, virtual enterprises, dynamic supply chain, professional virtual communities, collaborative virtual laboratories, etc. (Camarintha-Mathos and Afsarmanesh, 2005). The digital community for MSMEs is built based on three main networks, namely Information and Communication Technology (ICT), knowledge, and social networks. This enables MSMEs to overcome barriers and engage with current or potential stakeholders globally, and broaden the business horizons that generate their economic growth. Moreover, more and more MSMEs are doing online business or online interactions with partners, resulting in additional tasks on how to maintain this digital community (Fachrunnisa et al., 2012).

The application of DCN technology to the coffee farming community is interesting to study because the coffee farming system based on the agroforestry system produces unique coffee, both ecologically (flood and landslide prevention) and economically.

2 Method

A case study with a qualitative method (In-depth interview) with number of respondents were 30 people from 313 coffee farmers of the Tenjolaya Forest-Village Nongovernmental Organization. This research conducted mapping the quality of the product (coffee), condition of coffee farms, the needs and strengths of coffee farmers, the existing condition of the coffee supply chain, a national standard coffee processing capabilities, and the ability to use digital marketing. The research was conducted from May to November 2021 in Bandung Regency, West Java.

Interviews with coffee farmers included questions such as obstacles in setting quality standards, obstacles in coffee marketing, communication in groups, the role of leaders in managing communities, the desire to improve communication in the community, and the use of digital marketing. Based on the data obtained, we created a digital community model.

3 Result and Discussion

The results showed that there were two problems faced by the Tenjolaya community, namely, product competitiveness improvement and product-to-market connectivity. Product competitiveness improvement based on data indicates that farmers cannot facilitate buyer requests regarding coffee quality standards due to a lack of capital, lack of product standard information, lack of access to market, and an issue of farmer credibility (Fig. 1). Banti and Abraham (2021) suggest that the post-harvest process determines the quality of coffee, especially in coffee processing. Meanwhile, Wahyudi (2020) stated that sustainability certification is a pillar to promote Indonesian coffee's competitiveness. Other efforts to increase product competitiveness, especially for exports, are exhibition and competition (Directorate General of America and Europe, Ministry of Foreign Affairs of the Republic of Indonesia, 2013).

The second obstacle faced by coffee farmers in the Tenjolaya Community is product connectivity from producer-to-market (Fig. 2). The first obstacle is that most of coffee farmers don't have gadgets and are constrained by internet signal. The second obstacle is that farmers are less proficient in using digital platforms for marketing. The third obstacle is that farmers and buyers are constrained by 3 Q (quality, quantity, and continuity). According to Ghoumrassi et al. (2019), product quality, delivery, and good market share must be controlled because of the high cost. Also, the flow of information between the various actors in the supply chain must be transparent and efficient. Supply chain flow improves efficiency, cost control, time management, quality control, and product competitiveness.

We created a digital community model based on the data on obstacles in setting quality standards, obstacles in coffee marketing, communication in groups, the role of

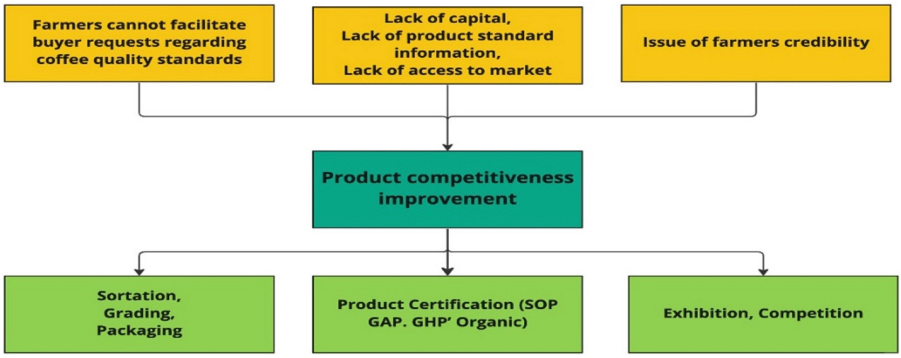

Fig. 1. Product competitiveness improvement of Tenjolaya Community

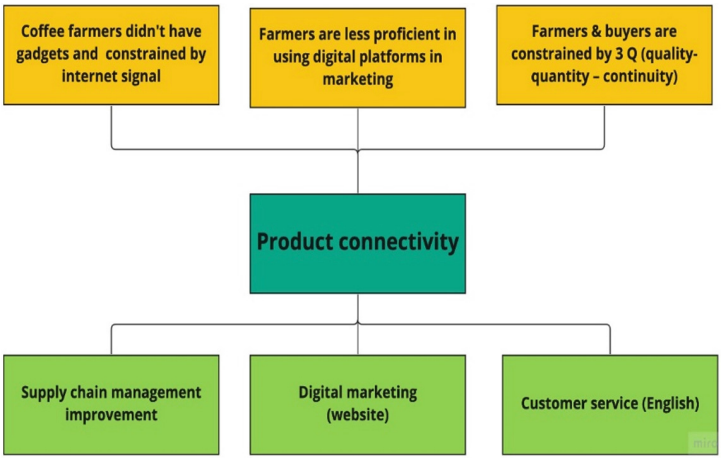

Fig. 2. Constraints and solutions of product connectivity in Tenjolaya Community

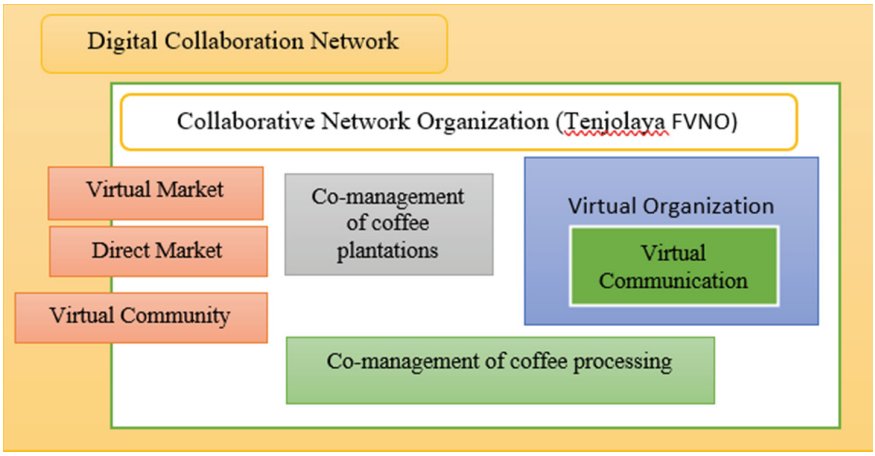

Fig. 3. DCN model in Tenjolaya Community Source: Modified model from Camarintha-Mathos and Afsarmanesh (2005)

leaders in managing communities, the desire to improve communication in the community, and the use of digital marketing (Fig. 3). This model was developed with the assumption that coffee farmers have used the website (WWW) for marketing their coffee. DCN on Tenjolaya FVNO describes a virtual organization internally, saying that they can communicate internally. Co-management in plantations and coffee processing showed improvements in communication, both virtually and through regular meetings. The establishment of a digital community is aimed at increasing marketing and sales to the market, both virtually and directly using social media.

4 Conclusion

The Digital collaboration network is related to product mapping and coffee farmers, namely product competitiveness and product connectivity. The results showed that product competitiveness and product connectivity were low. The model of a digital collaborative network for coffee marketing was very useful for increasing the income of coffee farmers during the COVID-19 pandemic because they are able to communicate and interact virtually.

Acknowledgment. We would like to thank the Research and Community Service Department at the Bandung Institute of Technology for funding this research. Thank you to the coffee farmers in Tenjolaya FVNO, M. H. Izzatullah, Refo P. Putra and M. Akmal.

References

Camarintha-Mathos L. M. and Afsarmanesh H.: Collaborative networks: a new scientific discipline, Journal of Intelligent Manufacturing, 16, 439–45 (2005)

Camarinha-Matos, L.M. , Rosanna Fornasiero, Javaneh Ramezani and Filipa Ferrada (2019): Collaborative Networks: A Pillar of Digital Transformation, Appl. Sci. , 9, 5431, p.1-33 (2019)

Danuri, M.: Perkembangan dan transformasi teknologi digital, INFOKAM, 2 (15), p.116-123 (2019)

Fachrunnisa, O., Mutamimah and Gunawan: A Framework of Digital Collaboration Networks for SME's Sustainability, last accessed 2020/11/20 (2012)

GoodStats https://goodstats.id/article/10-provinsi-dengan-estimasi-produksi-kopi-terbanyak-tahun-2022-IwfhD, last accessed 2022/11/06.

Banti, M and E. Abraham: Coffee Processing Methods, Coffee Quality and Related Environmental Issues, Journal of Food and Nutrition Sciences, 9(6): 144–152 (2021)

Directorate General of America & Europe, Ministry of Foreign Affairs of the Republic of Indonesia: Welcome to The Heaven of Specialty Coffee, Jakarta (2013).

Wahyudi, A., S. Wulandari, A. Aunillah and J.C. Alouw, Sustainability certification as a pillar to promote Indon, IOP Conference Series: Earth and Environmental Science, Volume 418, Issue 1, pp. 012009 (2020).

Ghoumrassi, A, H. Kabalan, and G. Ţigu: The role of Supply Chain in improving competitiveness, Proceedings of the 13th International Conference on Business Excellence, pp.589–600 (2019)