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Viability Assessment of Bank-associated Crowdfunding Platform: A Viable System Model Approach

(Penilaian Daya Maju Platform Pendanaan Awam berkaitan Bank: Pendekatan Model Sistem Berdaya Maju)

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ABSTRACT

This study examines the viability of a bank-associated crowdfunding platform, specifically a form of equity crowdfunding. It diagnoses the platform's operation and information flow as a complex organization involving multiple agencies, employing the Viable System Model (VSM) framework as a diagnostic tool to assess operations, identify problems, and evaluate viability. Interviews were conducted with small and medium enterprises (SMEs) as platform users, the platform managers, and the banker. The findings demonstrate that the platform possesses elements of viability but lacks a dedicated unit to perform intelligence functions - specifically, the collection of information from the environment for integration into the system. While some information flows from the system to the environment, they are limited. Additionally, there is an absence of information flow between intelligence and control, between intelligence and policymaking, and vice versa. The results also highlight the central role of Islamic banks within the platform. This study contributes to the literature by developing a diagnostic framework that integrates the principles of VSM with those of crowdfunding platforms. The findings highlight the need to institute an integrated platform intelligence function and to ensure effective information flows among system functions in managing environmental variety.

Keywords: Intelligence function; Islamic banks; small-medium enterprises (SME); viable system model; crowdfunding platform; diagnostic framework

ABSTRAK

Kajian ini mengkaji daya maju platform pendanaan awam yang berkaitan dengan bank. Konsep platform yang dipilih dalam kajian ini berbentuk pendanaan awam ekuiti. Secara khusus, ia mendiagnosis operasi dan aliran maklumat platform sebagai organisasi kompleks yang melibatkan agensi yang berbeza. Ia menggunakan Model Sistem yang Berdaya Maju (VSM) sebagai alat diagnostik untuk menganalisa operasi platform, mengenal pasti masalah dan menganalisis daya maju platform. Kajian ini menemubual Perusahaan Kecil Sederhana sebagai pengguna platform, pengurus platform dan pegawai bank. Penemuan menunjukkan bahawa platform ini mempunyai unsur berdaya maju. Walau bagaimanapun, ia tidak mempunyai unit khusus yang melaksanakan fungsi penanggapan (intelligence). Secara khusus, fungsi pengumpulan maklumat daripada persekitaran ke dalam sistem tidak ada, manakala penyampaian maklumat daripada sistem kepada persekitaran wujud tetapi terhad. Selain itu, tiada aliran maklumat daripada fungsi "intelligence" kepada fungsi kawalan, daripada fungsi "intelligence" kepada fungsi penggubalan dasar, dan sebaliknya. Hasil kajian juga menunjukkan peranan utama bank Islam dalam platform tersebut. Kajian ini menyumbang kepada literatur dengan membangunkan kerangka diagnostik yang mengintegrasikan prinsip VSM dan platform pendanaan awam. Penemuan kajian menyerlahkan keperluan untuk mewujudkan fungsi penanggapan (intelligence) yang bersepadu bagi platform dan memastikan aliran maklumat antara fungsi dalam menguruskan kepelbagaian persekitaran.

Kata kunci: Fungsi penanggapan (intelligence); bank Islam; perusahaan kecil sederhana (PKS); model sistem yang berdaya maju (VSM); platform pendanaan awam; kerangka diagnostik

INTRODUCTION

An organisation, including a crowdfunding platform, can self-exist if it can sustain effective operations by maintaining a symbiotic and balanced relationship with its environment over the long term. Generally, a crowdfunding platform acts as an intermediary between ventures and investors. In this study, we examined a platform that provides financing by channelling funds from investors to viable projects and ventures, including small and medium enterprises (SMEs). SMEs are a crucial component of national economic development. The contribution of SMEs to GDP in Malaysia, for example, is 37.4% in 2021 (Department of Statistics Malaysia 2022). The crowdfunding platform enables ventures to secure additional capital to support business growth and sustainability. Crowdfunding allows ventures to raise funds in the form of investment or donations from individuals through the Internet (World Bank 2013). Traditionally regarded as an alternative to bank financing, crowdfunding has more recently evolved to incorporate bank participation giving rise to what we term *bank-associated crowdfunding platforms*. This type of platform is the focus of our study.

The bank-associated crowdfunding platform examined in this study operates as a form of equity crowdfunding. It is backed by several banking institutions through the offering of investment accounts to investors. The bank-associated crowdfunding platform was introduced by the Central Bank of Malaysia as part of the country's strategy to promote Islamic equity-based financing. It offers bank depositors a Shariah-compliant investment option while providing alternative financing to SMEs in support of long-term economic development. The platform is expected to improve SMEs' access to bank financing making it viable in the long-term. This necessitates an assessment of its operational viability, with important implications to the platform's sustainability.

The platform facilitates efficient intermediation by matching the financing requirements of ventures, specifically SMEs, with investment from retail and institutional investors via investment accounts (Kasri & Ahmed 2017). Thus, the financing process involves three parties: investors, ventures (SMEs), and the platform. However, as of 2023, the number of participating SMEs remains very small relative to the expenditure in setting up the bank-associated crowdfunding platform (Riswandi et al. 2023). On average, only three to four ventures are listed annually (Investment Account Platform 2017), compared with the huge initial investment of approximately RM 72 million (Kasri & Ahmed 2017). Many SMEs that applied for funding through this platform fail to meet the stringent eligibility requirements set by the participating banks (Enriquez 2022). In addition, investors are subject to central bank restrictions, including limits on maximum investment amount and eligibility to local entities (Kasri & Muhammad 2019). These constraints result in limited diversity among participating SMEs.

In contrast, SMEs face a wide range of evolving challenges, resulting in a high degree of variety within the SME environment. According to the VSM, variety is defined as the number or extent of complexities faced by SMEs (Beer 1984; Espejo & Gill 1997). It is therefore crucial for banks to understand the nature and constituents of this variety in order to better serve their SME clients more effectively. A lack of understanding the variety may lead to the rejection of applications from SMEs that genuinely need the funding. The nature of the platform under study is multi-sided and characterised by complex interactions, as its operations involve several entities, namely banks, investors, ventures and the platform itself. Effective information flow is critical in improving the coordination among these entities. Furthermore, the platform must remain viable to sustain its operations within its operating environment.

Given these considerations, it is important to assess the viability of a bank-associated crowdfunding platform. This is crucial for sustaining effective operations in serving banks, investors, ventures, and the platform itself.

Therefore, this study examines the viability of such a platform, with particular focus on diagnosing its operations and information flow. This study is guided by the following research question: *How viable are the operations and information flow of a bank-associated crowdfunding platform in supporting SME development?*

The Viable System Model (VSM) framework is employed as a diagnostic tool to examine the operations, information flows, and viability of a bank-associated crowdfunding platform. A viable system emphasizes certain resources and relationships necessary to sustain organizational viability (Beer 1984; Espejo & Gill 1997). The VSM has previously been applied to analyse the inner systems and diagnose organizational problems (Rezaee 2019). In this study we developed a diagnostic framework that integrates the principles of VSM with the crowdfunding platform. The framework emphasizes the role of information flows between functions in conceptualizing the viability of a platform and serves as the normative model for assessing the viability of a bank-associated crowdfunding platform. The VSM has also been employed to identify weaknesses in existing systems, design viable systems (Espinosa et al. 2023; Hildebrand & Bodhanya 2015), and diagnose the structure of organizational pathologies (Cardoso-Castro & Espinosa 2020).

The next section discusses the VSM framework for diagnosing bank-associated crowdfunding platform. This is followed by an elaboration of the system diagnosis methodology. The subsequent section presents the findings, and the conclusion given in the final section.

VSM FRAMEWORK OF THE BANK-ASSOCIATED CROWDFUNDING PLATFORM AS A VIABLE SYSTEM FOR CHANNELING FUNDS FROM INVESTORS TO VENTURES

To develop a framework for system diagnosis, it is essential to provide background information on SMEs as beneficiaries of the platform, the bank-associated crowdfunding platform, and the VSM framework. The following paragraphs discuss SME development and the concept of a bank-associated crowdfunding platform before elaborating on the VSM framework.

SME DEVELOPMENT

SMEs are widely considered as vital to economic development (Hashim et al. 2023); hence, it is important to maintain their resilience. According to the enterprise development theory, SME development has several phases, starting with the existence stage, followed by the survival stage, the success stage, and the take-off stage before finally reaching the resource maturity stage (Churchill & Lewis 1983). In the existence stage, the entrepreneurial venture seeks to build operations without a formal structure, with the owner closely monitoring every business activity.

In the survival stage, additional capital is required for expansion, often obtained by bringing in close friends and family as partners. At this stage the primary objective is to maintain cash flow for daily expenses and operational needs. At the success stage, the ventures begin generating profits and accumulating sufficient funds to invest in new projects or maintain their current growth rate. At the early stages of firm development, the business focuses on team building and employee development, guided by the entrepreneur's values and vision. Securing financing from formal institutions can be difficult; thus, crowdfunding platforms may serve as valuable source of finance (Riswandi et al. 2023). In the take-off stage the firm concentrates on expanding its business and exploring new opportunities. By this stage, it has developed a more formal organizational structure with clear delegation of responsibilities, enabling it to secure funding from both crowdfunding platforms and formal financial institutions. Finally, at the resource maturity stage, in addition to creating a niche, the firm focuses on quality standards, and implementing financial controls. At this stage, the firm often achieves high revenue with a large workforce, and in consequence it may no longer qualify as a small enterprise (McMahon 1998). Access to financing from crowdfunding platforms and formal financial institutions is generally straightforward.

BANK-ASSOCIATED CROWDFUNDING PLATFORM

The bank-associated crowdfunding platform examined in this study is an online platform established in 2015 and owned by a consortium of Islamic banks. It was developed under the direction of the Central Bank of Malaysia for two main reasons. First, it provides greater opportunities for SMEs to secure financing from banks, consistent with the principle that Islamic banks should provide value-based intermediation by supporting SME development. Second, the platform offers a *Shariah*-compliant investment for bank depositors, providing actual returns based on invested funds rather than interest, in compliance with the Islamic Financial Service Act (IFSA) 2013. The IFSA is a law enacted to regulate and supervise Islamic, financial institutions payment systems, and other relevant entities. The crowdfunding platform also seek to cater to a broad spectrum of investors' risk-return preferences (Central Bank of Malaysia 2015).

Figure 1 shows that funding for the bank-associated crowdfunding platform is sourced from depositors of the bank's investment accounts. Thus, the interested depositors cum investors channelled their funds for the crowdfunded ventures through these investment accounts. Both the banks and crowdfunding platform conduct suitability assessments for investors, including evaluations of risk preferences and financial capacity. To encourage participation, individual investors who generate profits from their investments for three consecutive years are given a tax exemption incentive (Investment Account Platform 2022). Ventures seeking funding must apply online or through any participating bank. The banks conduct due diligence while the crowdfunding platform evaluates the credit ratings and negotiates financing terms and conditions. Once approved, the venture is listed on the platform for crowdfunding and subsequently receives funding from the bank. Hence, the bank-associated crowdfunding platform serves as an intermediary between investors and SMEs/ventures, in contrast to conventional bank financing facilities where SMEs/ventures directly apply for funds from banks.

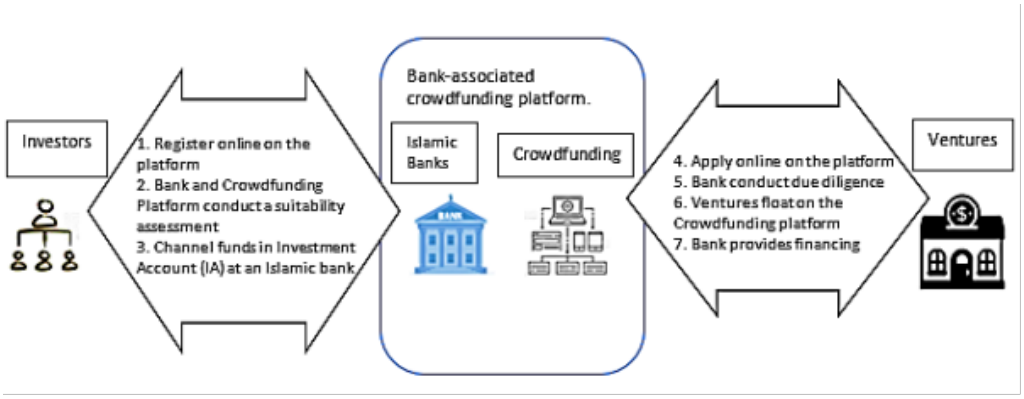

FIGURE 1. Bank-associated crowdfunding platform
Sources: Adapted from Investment Account Platform (2017), and authors' own conceptualization

This platform creates value for stakeholders such as ventures/SMEs, investors, and banks, by promoting financial inclusion, financial returns, and financial stability. This is achieved through facilitating entrepreneurial activities, community empowerment through equitable wealth distribution, ensuring regulatory compliance under the Central Bank, and maintaining robust self-governance through a culture of self-discipline embedded in banking operations and practices (Central Bank of Malaysia 2018). The platform however faces several challenges. First, stringent requirements imposed by banks limit the number of SMEs eligible for financing. Second, funding is limited to a maximum of MYR500,000, which may deter larger investors. Third, the returns to participating banks are lower compared to direct SME financing, as profits must be shared with the platform. This may discourage participating banks from promoting the platform to their clients.

VSM FRAMEWORK FOR DIAGNOSING BANK-ASSOCIATED CROWDFUNDING PLATFORM

This study adopts the VSM framework, founded on systems perspective principles, as a diagnostic tool to assess operations of a bank-associated crowdfunding platform. This framework enables the investigation of the platform's ability to achieve its objectives from a systems perspective. A key assumption of this perspective is that a system consists of sub-systems and elements that co-exist. Employing the system perspectives thus provides a better understanding of all coexisting elements in a given system. Furthermore, the analysis enables us to conduct a comprehensive assessment compared to non-systemic approaches which typically focus on isolated aspects.

The basic VSM framework is illustrated in Figure 2. In addition to its diagnostic role, VSM has also been employed as a modelling tool (Beer 1989; Espejo 1997). The framework draws on systems theory and cybernetics (Espejo and Gill 1997), the latter emphasising the necessity of control mechanism within systems. These mechanisms ensure effective communication through automatic feedback between system elements (Espejo & Gill 1997). VSM has been used across several fields as a tool for diagnosing system viability (Adham et al. 2011; 2020; Azadeh et al. 2012). It assumes that each system comprises multiple sub-systems, extending down to the individual level, and that these in turn contain further sub-systems. According to the VSM framework, all sub-systems must themselves be viable for the overall system to be considered viable. Viability refers to the organisation's capacity to be self-sufficient within a complex environment (Hoverstadt 2020). Such self-sufficiency is achieved through efficient information flows and effective control mechanisms, thus providing the flexibility required to adapt and endure in dynamic and complex environments over the long term (Puche-Regaliza et al. 2020)

Recursiveness, cohesiveness, complexity, variety, and responsiveness are the essential principles underlying a viable system. In VSM terminology, recursiveness refers to the property of a viable system, which comprise sub-systems, which in turn contain further sub systems, where each possesses the property of viability. Managing system complexity requires consideration of system variety. Variety is one of the fundamental principles of the VSM for describing complexity; the greater the variety, the higher the complexity. The higher the level of complexity within a particular system or environment, the greater the variety required to maintain system viability (Beer 1989; Espejo & Gill 1997; Hoverstadt 2008). Cohesiveness refers to a characteristic of a viable system in which information flows between its functions as well as between the system and its environment to achieve its purpose (Beer 1989; Espejo & Gill 1997). This enables the system to deploy its internal varieties to address environmental complexities or external varieties (Espejo & Gill 1997).

The recursiveness and cohesiveness principles enable a system to adapt to its internal and external varieties, respectively (Jackson 1992). A platform that adheres to VSM principles can effectively respond to various environments, thus managing the complexities of both the internal and external environments. In applying these principles, the objective of the system-in-focus must be clearly defined (Espejo & Reyes 2011).

In this study, the system in focus is a bank-associated crowdfunding platform that channels funds from investors to finance viable ventures. The objective is to operate as a viable platform that fulfils the purpose of its establishment – i.e., supporting SME development – while ensuring profitability for all market participants, which include the banks, investors, ventures, and the platform itself. The internal variety of the bank-associated crowdfunding platform includes participating Islamic banks and crowdfunding platform, whereas the external variety comprises investors and ventures' demands, as well as varying market conditions.

The bank-associated crowdfunding platform, as a system, must operate cohesively to mobilize the five viability principles: policymaking, intelligence, control and monitoring, coordination, and implementation. Integrating these principles addresses the limitations of previous studies on crowdfunding platforms, which have not sufficiently emphasized the information flows among these functions when conceptualizing the viability of a platform. Adapting the framework from Adham et al. (2018), (2017) and Espinosa (2025), the platform, as the system-in-focus, has an upper-level metasystem that includes the highest decision-making function of policymaking (System 5). This function is responsible for internal decision-making based on information gathered by the intelligence function (System 4) from both internal and external sources. The intelligence function communicates directly with external environments, collecting relevant information and communicating it to the policymaking function. It further disseminates policy decisions to the control function and shares relevant system information with the external environment. The control function (System 3) allocates resources and issues directives to the management unit within the implementation function. The audit unit (System 3*) monitors the activities of the operating units in the implementation function. Coordination (System 2) function facilitates collaboration among the different operating units in the organizations to ensure smooth system operations. Moreover, the management unit (System 1) must report its performance to the control function, while the operating unit (Sub-system 1) delivers the services and information to targeted customers in the system's environment. Customers' feedback is then provided to the management unit, thus ensuring continuous information flow among the operating units.

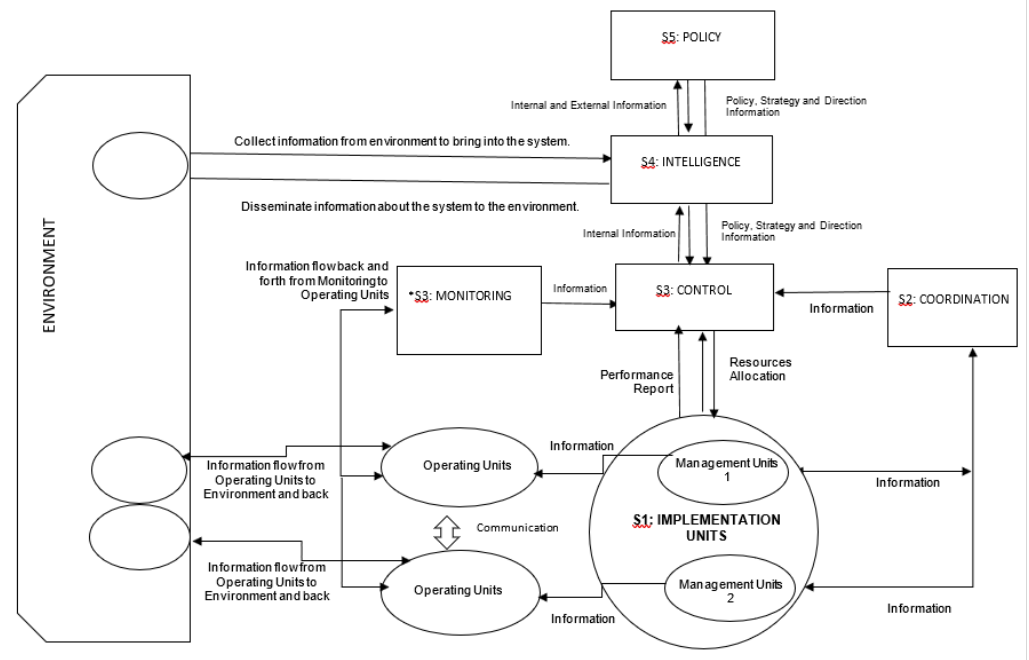

FIGURE 2. Viable system model with an explanation of arrow and line.
Sources: Adapted from Beer (1981) (1989), Espejo and Gill (1997); Hoverstadt (2008)

METHODOLOGY OF SYSTEM DIAGNOSIS

We diagnosed a 'bank-associated crowdfunding platform' operation as a system that focuses on facilitating the channelling of funds from investors to ventures. The objective of the platform was to find an avenue for banks'

investment accounts while contributing to SME development. This study employed a qualitative design, which enabled an in-depth understanding of the phenomenon from the viewpoint of those directly experiencing it (Merriam 2009). Furthermore, adopting the qualitative design enabled a more guided and structured approach to data collection and analysis. The research process began with the identification of the research problem and the development of a conceptual framework, followed by data collection and analysis. An interpretive stance was adopted, with the data analysed using the VSM diagnostic framework (Harwood 2019). The diagnostic framework integrates the principles of VSM with the operational characteristics of crowdfunding platforms. Thus, the combined understanding of VSM and these concepts underpinned the development of the diagnostic framework. The VSM principles explain the functions of a viable system and the information flows between these functions, while the concept of crowdfunding platform defines the general operations of a platform that serves multiple stakeholders on different sides. This diagnostic framework thus serves as a normative model for assessing the viability of bank-associated crowdfunding platforms.

The research procedures were adapted from Creswell (2007), Merriam (2009) and Merriam and Tisdell (2016). First, the need to diagnose the bank-associated crowdfunding platform model was established. Second, the diagnostic framework was developed based of the VSM. Third, we developed three interview protocols based on the framework, including the platform side (platform owner and managers), the bank side, and the environment side (ventures that received funding through the platform). Fourth, the respondents were selected based on the following criteria: a) the crowdfunding platform owner responsible for the operations of the bank-associated crowdfunding platform; b) the managers and executives of participating banks; and c) the selected ventures. Table 1 presents the background of the interview respondents. To preserve anonymity, respondent codes were used. Interviews with the platform owner, bank managers, and executives examined the operation's operational flow, while interviews with ventures determined the services provided. This approach enabled the collection of rich insights into the platform's service delivery.

TABLE 1. Profile of interview respondent

Institutions	Respondent	Position
Crowdfunding Platform Owner	Platform Owner A	Senior Manager
Crowdfunding Platform Owner	Platform Owner B	Top Management
Banks	Bank A	Senior Manager
Banks	Bank B	Top Management
Venture	Firm A	Top Management

Fifth, we conducted interviews with the identified respondents. These interviews were audio-recorded and subsequently transcribed. Interview transcripts comprise the main dataset used for this study. Sixth, the diagnostic framework was applied to guide data analysis, with emphasis on the principles and functions of the VSM framework. Based on the interview responses, we mapped the services provided by the crowdfunding platform and the participating Islamic banks regarding the channelling of funds from investors to ventures onto the VSM framework. The analysis further identified additional themes related to platform operations. Seventh, the mapping process was validated through a cross-comparison procedure (Merriam 2009; Merriam & Tisdell 2016). The emergent themes from the interview transcripts were reiterated and cross-compared with the principles and functions of the VSM framework. The data analysis was concluded once saturation point was reached from the interviews with the three groups of respondents. Supplementary information from the related websites and annual reports was also used to support the interview data.

Regarding validity, as suggested by Creswell and Miller (2000) and Merriam and Tisdell (2016), the mapping process onto the VSM framework was confirmed through member checks. Member checking, as proposed by several experts (Merriam 2009; Merriam & Tisdell 2016; Tong et al. 2007) involved selecting respondents capable of assessing the plausibility of the emergent model. In this process, a respondent - one senior manager and a PhD holder with expertise in VSM framework application – participated in the validation procedure. Moreover, the bank-associated platform-VSM model was validated by presenting it at a seminar on VSM. This completed the mapping of platform operations against the VSM framework. The final output is an emergent model that demonstrates the bank-associated crowdfunding platform operation, as shown in Figure 3.

FINDINGS

The bank-associated crowdfunding platform is a consortium of seven Islamic banks. It operates as a wholly-owned subsidiary of a holding company that began operations as an internet-based multibank investment portal in 2015. The portal facilitates efficient intermediation by matching venture financing requirements with investment from

institutional or retail investors via an investment account. The platform offers a supportive environment with unique value propositions for accommodating banks, ventures, and investors.

Banks on this platform identify potential investors on the basis of their applications and conduct a suitability assessment valid for one year, to determine the investor's risk profile. When investors decide on the investment amount and deposited the funds into the bank's current or savings account, the bank opens an investment account.

For venture selection, the potential ventures must apply online through the platform. The bank conducts a preliminary assessment and, if viable, negotiates the financing terms and conditions before obtaining an independent rating from an external rating agency. Upon approval, the bank lists the venture on the platform, thereby making it available to investors.

The next section analyses the bank-associated crowdfunding platform based on VSM, followed by the Platform Environment.

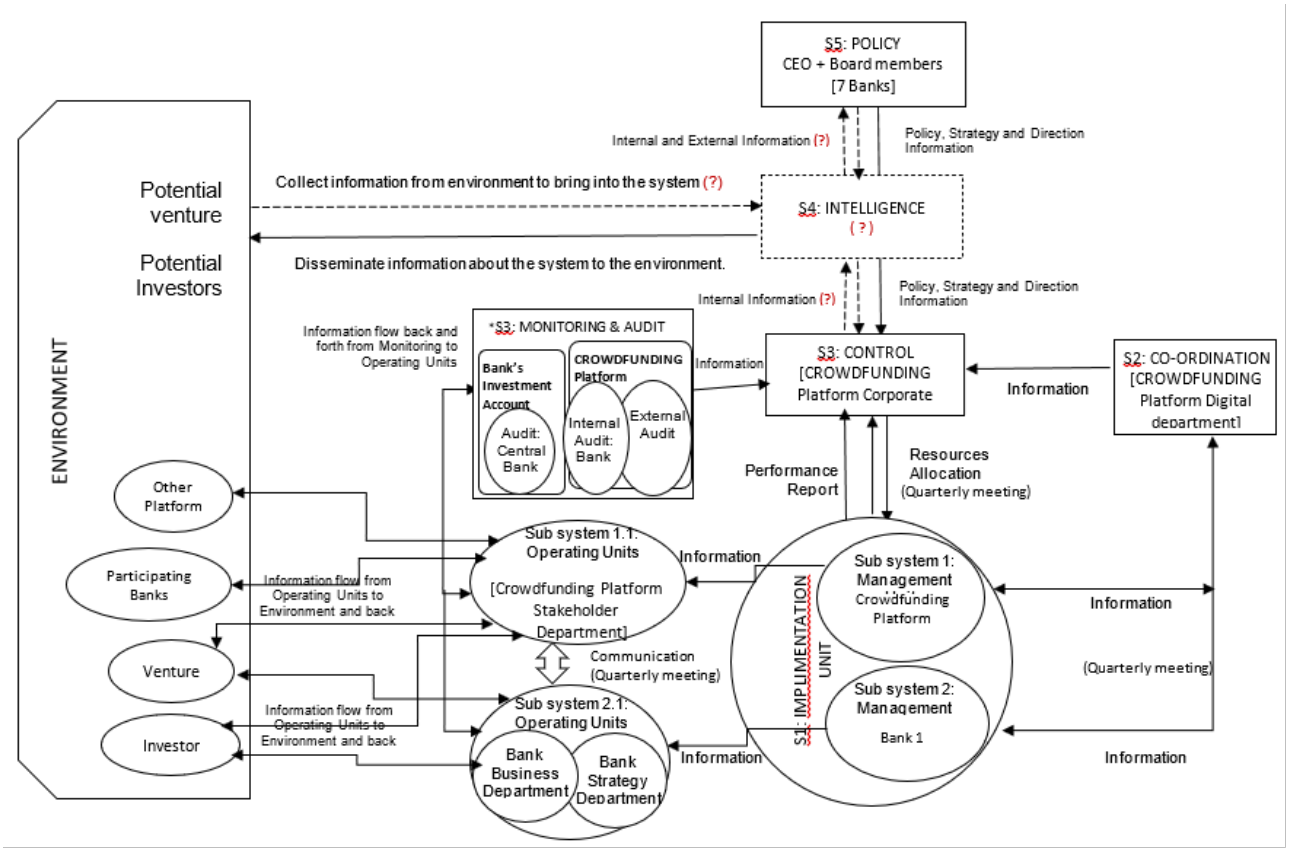

FIGURE 3. Framework for bank-associated platform using VSM analysis
Note: The dashed line and question mark (?) explain the missing and unclear function unit.

ANALYSIS OF BANK-ASSOCIATED CROWDFUNDING PLATFORM BASED ON VSM

Figure 3 illustrates the results of the diagnosis of bank-associated crowdfunding platform operation using the VSM framework. The analysis begins with policymaking in System 5 and intelligence in System 4, followed by the monitoring function in System 3, and subsequently System 1 and System 2.

System 5 and System 4. At its inception in 2015, the policymaking function was located in the Central Bank of Malaysia. By 2019, it had been fully transferred to the platform's top management. The platform helps banks match venture financing requirements with investment through *Shariah*-compliant investment accounts. The ventures include SMEs, innovative firms, and new firms with viable projects. The platform facilitates ventures that do not fulfil bank financing requirements for capital injection or working capital by facilitating alternative financing via investment (System 5-policy making).

In this platform, the main responsibility of a participating bank is to provide investment accounts for investors, managing platform, and liaising with investors and venture capitalists. The platform owner disseminates information

about the platform to potential investors and ventures, and communicates directly with top management (System 4 – intelligence). Accordingly, the information is shared with the external environment through seminars, booths, collaborations with SME associations, and talk roadshows, as mentioned by crowdfunding platform owner B:

"We have reached out to the SMEs; for example, we set up a booth at exhibitions, conduct seminars, and roadshows." We have been invited several times to pitching sessions organized by organizations, such as the investor community, for high-net-worth individuals. So, we set up the booth, apart from promoting the platform on social media as well."

However, promotional activities have been limited, with ambiguity over whether responsibility lies with the crowdfunding platform or the banks. Crowdfunding Platform Owner A remarked:

"The bank should market the product because it is its product." If they market the product, people will subscribe, so that is the banks' market. We market the platform and what the platform can do. Normally, we market to investors, so they know the platform, which is the avenue for investment."

Participating Bank A added;

"It is not that banks don't want to promote the platform, but bank resources to promote the platform are limited as the resources allocated for the platform are small".

The process of collecting information from the external environment and integrating it into the system is lacking. Hence, there is no clear plan of action regarding how the bank-associated platform collects and channels information from the environment to the system. Consequently, there is no effective flow of information on the environment from intelligence to policymaking and control functions. This deficiency may help explain the limited participation of "crowd" investors and SME entrepreneurs on the platform.

System 3. System 3 is responsible to resource negotiation (Beer 1984), which allocates system resources among operating units according to their duties and objectives. The bank-associated crowdfunding platform is jointly managed by the participating banks and the platform operator. It conducts suitability assessments on investors and monitors ventures. According to the platform owner, the corporate department manages corporate relations and administrative services to ensure appropriate operational control (System 3).

The internal and external audit processes reflect the monitoring function with the bank-associated crowdfunding platform (System 3*, monitoring). The investment accounts of all participating banks are internally audited by the Central Bank, as mentioned by Bank B:

"Central bank will do our audit because it governs all the banks in Malaysia. They will audit the investment account instead of the platform".

According to the platform owner, internal audits of the platform itself are carried out by the participating Islamic banks on a rotational basis.

"Our internal audits are performed by the participating Islamic banks, with different audit rotations".

For external audits, the platform is audited by *PH Audit*, an independent audit firm. This firm examines the entire process, including the project-level operations, as mentioned by crowdfunding platform owner B:

"They even audit processes. They ensure that all the approval processes, the documentation are in good order. Everything undergoes a very thorough audit".

By 2023, 14 ventures will be financed by banks (Investment Account Platform 2022).

System 1 and System 2. The main activities of the implementation unit, S1, are to provide information on new projects to new ventures and investors, existing ventures and investors, and participating banks. It further share details of unsuccessful projects with other crowdfunding platforms. S1 further receives information on risk profile from new investors, information from new ventures on their credit standing, attracts new venture and investor from bank existing database. In addition, it assesses the credit standing of new venture applications, conducts suitability

assessment for investors, and collects progress updates from existing ventures. S1 is subject to both internal and external audits.

The implementation unit, S1, comprises two management units: a crowdfunding platform (sub-system 1) and Bank 1 (sub-system 2). For the crowdfunding platform, the management unit (sub-system 1) disseminates information from S3 to the operating unit (sub-system 1.1). The operating unit (sub-system 1.1), namely the Stakeholder Department, directly serves potential and existing ventures and investors by providing information on new projects. It also provides such information to banks and monitors existing ventures. In addition, it shares details of unsuccessful projects with other crowdfunding platforms. Sub-system 1.1 also gathers information from potential and existing ventures and investors, banks, other banks, non-bank institutions, and other crowdfunding platforms.

For Bank 1, the management unit (sub-system 2) disseminates information from S3 to the operating units. The operating units (sub-system 2.1) consists of the Bank Strategy Department and Bank Business Department. The strategy department attracts new ventures and investors from the banks' existing customer base by utilising the bank's database. The Bank Business Department assesses the credit standing of new venture applications and conducts suitability assessments by comparing the investor's risk profile with that of the venture. This department also receives information from new ventures on their credit standing and from existing ventures on their progress. It further receives risk profile from new investors.

Co-ordination, S2, is the Platform Digital Department which coordinates and facilitates activities between the crowdfunding platform (sub-system 1) and Bank 1 (sub-system 2) to ensure smooth running of the operation. Sub-system 1 and sub-system 1.1 hold quarterly meeting with sub-system 2 and sub-system 2.1 to exchange information on the status of ventures and investors, including unsuccessful venture applications. S2 then forwards this information to the control, S3.

THE PLATFORM ENVIRONMENT: VENTURE AND SME DEVELOPMENT

This section discusses the main elements of the platform environment, focusing on the SMEs. The SMEs targeted by the platform is the beneficiaries of its services. Figure 3 illustrates the components of this environment, which include investors and SMEs as ventures. From 2015 to 2019, the number of ventures listed on the platform ranged from three to four per year. As of July 2020, a total of MYR211.24 million had been raised on the platform (Enriquez 2021).

One of the earliest ventures on the platform, referred here as Firm A, is a leading technology and solutions provider that has supported the financial industry in enhancing financial products. In an interview, the firm stated that it had received capital through funds raised on the platform and acknowledged benefiting from the services provided. Specifically, the firm received 70 % of the funds required, with the remaining 30% sourced from its own capital.

In addition, the associated bank offered consultation services on financing contracts through several discussions between Firm A and the bank's fund/customer relationship manager. This was explained by the owner of Firm A:

"A company like us will directly go to the bank and talk with the manager to discuss our funding issues and listen to their suggestions and opinions. That is how we decided on the crowdfunding option".

The owner further expressed satisfaction with the underlying Islamic financing contract, since it could support the firm's production growth and expansion into the global market:

"I am using the Islamic banking product, and I have seen many benefits. Since Malaysia is the halal hub for Islamic finance, our mission is not only to succeed in Malaysia but also to go abroad to grow our firm further." (Firm A).

Once a venture has fulfilled all its bank's requirements and is approved by the bank, it is listed on the platform for a set period, referred to as a 'campaign.' During the campaign period, investors can choose to fund the ventures through their bank investment account. The venture campaign period may be extended if the venture does not secure the required funding. Upon a successful campaign, i.e., when the venture has received the necessary funds and the campaign has concluded, the funds are disbursed to the firm. Following disbursement, the bank and the platform will continue to monitor each venture, and progress reports will be regularly published on the platform's website. It is important to regularly monitor venture performance to mitigate the risk of fraud (Investment Account Platform 2017). This point was also emphasised by Firm A:

"The funding that we received through the platform cannot be used for other purposes. Use of funding is controlled by the business department at the bank, and continuously monitored by the stakeholder department at the platform and business department at the bank".

In general, internet-based multibank investment portals enable banks to be transparent in crowdfunding platforms, thus protecting investors' rights (Kasri & Muhammad 2019). This transparency can enhance investor confidence in the platform. The central bank has also imposed strict conditions on investors, including restriction on the participation of international investors. Such measures could have negatively affected the overall number of investors (Kasri & Muhammad 2019).

SME ventures that disclose incomplete or opaque information fail to meet banks' requirements for raising funds on the platform. This implies that ventures without sufficient records are denied capital support. However, the platform manager typically redirects such ventures to alternative crowdfunding platforms that may operate under different requirements, as explained by platform owner B:

"The application process involved a venture that appoints us (the platform) as their agent. In the case of certain ventures in which we have come to realize that they would not qualify for the investment account, they may qualify for equity crowdfunding from the companies under the Securities Commission. They are not qualified for a banking product, but perhaps they are qualified for equity fundraising. So, we would reach out to our stakeholders on that side with whom we have a relationship and ask, can you please help this venture because they have applied to us and we cannot offer them the product they asked for."

DISCUSSION

Using the VSM framework we examined the existing operations, internal management, and environment of a bank-associated crowdfunding platform comprising seven banks and a dedicated platform unit. VSM is a system framework that emphasizes certain resources and relationships necessary to support organizational viability (Lowe et al. 2020). The platform facilitates the transfer of funds from investor to ventures. The diagnosis indicates that the platform operator performs only four functions of a viable system - policymaking, control, coordination, and implementation – while the intelligence function is absent. There is a lack of systematic collection of data from the environment into the system, and limited dissemination of information from the system back to the environment. As such, information flow is absent between the intelligence function and either control or policymaking.

The policymaking function (System 5) is carried out by the top management of the 'bank-associated platform'. Policymakers are responsible for directing the platform towards achieving its strategic objectives (Adham et al. 2020). The top management conducts monthly meeting sessions with the CEO and Board members of the seven participating banks. These meeting mainly focus on sustaining the platform. Initiative undertaken include seminars, roadshow talks, exhibition booths, and forming alliances with SMEs to attract potential ventures to the platform. Organizational environments are often characterised by dynamic complexity, great uncertainty, and ambiguity. Only intelligent organizations that adapt and grow sustainably can manage such conditions effectively (Schwaninger 2019). However, no specific department performs the intelligence function (System 4). Although information about the platform, potential ventures, and investors is disseminated to the environment, the platform does not sufficiently collect environmental data for integration into the system. The limited data gathered may have contributed to the limited number of approved venture applications.

The control function (System 3) and coordination function (System 2) are performed primarily by the crowdfunding platform division, which comprises the Corporate Department and the Digital Department. The control system is responsible for allocating resources and disseminating information from the upper-level system to the implementation unit. In this platform, the Corporate Department (System 3) fulfils the control function by linking internal information from the upper-level system to the implementation unit. The Corporate Department consists of corporate relations and administration. For long term viability, an organization requires an audit or monitoring unit (System 3*) to ensure that platform implementation is effectively controlled (Jackson 1988). In this case, the platform employs both internal and external audits. While the participating banks conduct the internal audit, an independent auditor carries out the external audit to assess the platform's entire operational process. For the banks' investment accounts, the central bank performs the audit.

The absence of a coordination function can cause conflict among units within System 1 (Lowe et al. 2020). To ensure smooth operations, the Digital Department (System 2) performs the coordination function between the

crowdfunding platform and the banks. The department plays a vital role in linking System 1 with System 3. Figure 3 illustrates the connection between the Digital Department and the operating units.

The operating system (System 1) is conducted by both the crowdfunding platform and the banks. While the operating unit (sub-system 1) delivers services and information to target customers, each department reports to its respective management unit (System 1) at the head office. Each department maintains its own policymaking, intelligence, and control functions. Within the crowdfunding platform, the operating unit is in the platform's Stakeholder Department, which engages with potential and new banks, ventures, and non-bank institutions, such as money market funds, investment banks, and hedge funds. The bank is also responsible for monitoring existing ventures.

Within the banks, the operating units related to the crowdfunding platform are the Business and Strategy Departments. The Business Department manages existing customers, namely ventures and investors focusing on customer management, while the Strategy Department deals with the fund management team.

The Stakeholder Department, together with the banks' Business and Strategy Departments collects customer information and submit it to the platform's Digital Department. The Digital Platform then disseminates the information to the Corporate Department, which subsequently reports this to the top management for further action. The link between the operating units and the Corporate Department, through the Digital Department, is illustrated in Figure 3.

Based on venture viewpoints, comprehensive financial aids, which includes accessing funds through crowdfunding platforms, drives business growth. The platform offers diverse financing structures, including debt-based, equity-based, or their hybrid arrangements, and provides broad access to investors. This visibility places venture within the scope of potential privileged investors, such as venture capitalists, who can support business establishment. The process of listing on the platform is more structured and regulated, with added credibility of central bank oversight ensuring the security of creditworthiness. However, many venture applications are rejected by participating banks due to non-compliance with the bank's requirements. Participating banks on the platform apply a stringent selection process, conducting credit rating assessments and due diligence to align venture risk with the bank's investment mandate.

For ventures that are unsuccessful in sourcing funding, the crowdfunding platforms facilitates connections with appropriated non-bank financial institutions. For example, a venture eligible for equity crowdfunding but unable to meet bank requirements may be referred by the Stakeholder Department to relevant government agencies. This approach enables ventures to receive alternative financial support and help manage its capital structure.

The findings indicate that the bank-associated crowdfunding platform comprises several operating units, including the crowdfunding platform and participating banks. The information flow is present at the policymaking level, where the CEO and Board of Directors meet quarterly. There is also information flow between the control and management units, the audit and operating units and within the implementation function, linking the internal environment (operating unit) with the external environment (investors and ventures). The Digital Department coordinates the information flow between the internal and external environments. Such connectivity across functions and between the system and its environment demonstrates elements of viability within the platform.

However, the platform lacks both an intelligence function and the associated information flow at the upper-level system. Although it disseminates information about itself to the external environment, it does not collect information from the environment back into the platform. Hence, there is a lack of information flow from the external environment to the intelligence unit. This absence leads to a lack of information exchange between the intelligence function and the policymaking function, and vice versa. Similarly, there's a lack of information flows between the intelligence and the control functions, due to absence of a dedicated unit for collecting and analysing internal information. Moving forward, the authority or platform manager must institute an integrated intelligence function within the platform. In addition, they must also ensure that information flows from the intelligence function to the policymaking and control functions, and vice versa, exists to enable effective management of environmental variety. The integration of such a function could strengthen the system's capacity to attract new applicants, including those from SME associations and business groups.

The absence of an intelligence function also implies the absence of its sub-systems, meaning that this function lacks recursiveness, which is one of the main principles of system viability. Without recursiveness in this function, it is difficult for the system to adapt to variety present in its environment. The platform's requisite variety is incomplete without an intelligence function; consequently, it lacks sufficient internal variety to address the complexities of the external environment. The requisite variety allows the platform to become responsive to the diverse needs of the stakeholders both internally and externally. This condition helps the platform adjust to the complexity of external and internal environments. To achieve requisite variety, the platform must establish an intelligence unit that welcomes feedback from the environment in order to remain viable.

Thus, the platform's viability depends on its capacity to operate and be responsive to the environment's complexities and varieties by ensuring consistent information flow at every level of recursion. Consequently, such viability is essential to ensure the profitability and long-term sustainability of the bank-associated crowdfunding platform.

CONCLUSIONS

This study investigates a new digital crowdfunding platform using the VSM framework as a diagnostic tool to evaluate platform operations, identify problems, and assess viability. The framework emphasizes the role of information flows among functions in conceptualizing the viability of a platform. Based on the diagnosis, we can conclude that this bank-associated crowdfunding platform, as a system, performs only four of the core functions of viability. It lacks a dedicated unit to carry out the intelligence function, of collecting information from the environment and feeding it into the system. Although the platform disseminates some information to the external environment, the scope is limited. For a system to be viable, the functions of policymaking, intelligence, control and audit, coordination and management must be present, along with the application of viability principles such as variety, cohesion, complexity and recursiveness.

THEORETICAL CONTRIBUTIONS

The main contribution of this study is the development of a normative framework that integrates the concept of viability into a multi-sided crowdfunding platform. In developing the diagnostic framework, we integrate the principles of VSM with the operational characteristics of the crowdfunding platforms. This diagnostic framework serves as a normative model for assessing the viability of bank-associated crowdfunding platforms. This novelty lies in the fact that existing crowdfunding literature does not emphasize information flows among the functions in conceptualizing a platform viability. This study leverages the robustness of the concepts and principles embedded within the VSM framework by highlighting the various constituents of the multi-sided platform and the requirements for information flows to sustain viability.

However, applying VSM is a demanding process. First, it requires the integration of relevant concepts or knowledge on the subject matter being diagnosed, which is a Shariah-compliant bank-associated crowdfunding platform. Understanding the subject matter is a prerequisite to building a diagnostic framework for assessing platform viability. In this study, developing a diagnostic framework requires an understanding of the principles of VSM and crowdfunding platforms. The combined understanding of VSM and the concept of Shariah-compliant crowdfunding platform underpinned the development of the diagnostic framework. VSM principles explain the functions of a viable system and the information flows between these functions while the concept of crowdfunding platform defines its general operations and distinctive characteristics, notably its role in serving multiple stakeholders on both the investor and venture sides. This diagnostic framework served as the basis for developing the study instrument, guiding data analysis, and creating a normative framework for mapping the findings onto the VSM structure.

VSM has not previously been applied to bank-associated crowdfunding platforms as a diagnostic tool for assessing system viability, although it has been used in other fields (Adham et al. 2020; Azadeh et al. 2012; Brocklesby & Cummings 1996). In the current study, the agencies involved are banks, which are highly regulated with operational characteristics different from those of government agencies (Enriquez 2022). Thus, the context differs from that of previous multi-agency studies (Perko 2022; Sydelko et al. 2021).

SUGGESTIONS FOR FUTURE RESEARCH

Future research should focus on developing a new model of a bank-associated crowdfunding platform with an effective intelligence function. Such a function must disseminate information from the internal to the external environment, and collecting information from the external environment back into the internal system. In addition, further research should explore means to improve information flow among the various agencies directly involved in supporting the development of SMEs. This would involve identifying the relevant agencies and their respective functions in SME support. The resulting information should inform the design of a viable support system with robust information flows that can effectively support development of SMEs.

IMPLICATIONS OF INDUSTRY PRACTICES

The findings of this study have several implications for platform management in the banking industry. First, understanding the information flow in the platform can assist policymakers of banking industries in developing guidelines for banks to implement crowdfunding mechanisms to foster business growth and expansion. This will enhance the service delivery within policy-based systems, where performance depends on effective information exchange between agencies. Second, the current study highlights the elements necessary for platform viability, particularly the integration of a platform intelligence function. Ensuring effective information flow between the intelligence function and the environment will enable the platform to effectively manage environmental variety. Integrating the intelligence function and its information flow will enhance the platform's viability, making its services to ventures, banks, investors and platform become more efficient and relevant, thereby benefiting society as a whole.

Third, for SMEs that fail to fulfil bank requirements, the authority should gather information to identify strategies for improving their access to funding. This includes obtaining assistance from other agencies to strengthen SME capacity. Ensuring the viability of bank-associated crowdfunding platforms for SMEs constitutes a part of providing a conducive environment for their growth. Going forward, a comprehensive approach to SME financing is needed to sustain their viability. Islamic banks participating in the platform could also diversify its funding instruments that better reflect Islamic values, while adopting flexible mechanisms to align funding structures with SME needs.

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