



Paper 86

Improving Acceptance Of Iposyandu Application In
Community Health Workers: Service Science Perspective

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Abstract - Maternal and Child health data report by Community health workers (CHW) is still using paper manually. Consequently, it creates delays in policymaking and implementation. Therefore, the iPosyandu application as developed presenting as a digital health platform in helping CHW store the data online. Despite the benefits of iPosyandu, CHW is still reluctant to use this application. Hence, this study aims to analyze the strategies that can be used to improve the acceptance of the iPosyandu in CHW based on a service science perspective. Service science of value co-creation was chosen as a strategy to create a model of CHW acceptance. By conducting focus group discussions, this study engages the participation of CHW and other relevant stakeholders to explore and develop the strategic processes. The result found the need for government policy support for digitalization in CHW and develop the platform, both in platform regulations and application readiness. After all, digitization in CHW can make stakeholders easier to monitor and more responsive to formulate health policies.

Keywords - Community health worker (CHW), iPosyandu, Service Science, Digitalization

I. INTRODUCTION

The Ministry of Health of the Republic of Indonesia defines Primary health care (PHC), known as Puskesmas, is a health service facility that prioritizes preventive and promotive efforts to achieve a high degree of public health and provide public and individual health services [1]. According to the Alma Ata Declaration, written on the Sustainable Development Goals (SDGs), PHC is essential in optimizing population health outcomes [2]. However, health workers (HW) like doctors, nurses, midwives, and nutritionists in PHC cannot be able to complete this goal by themselves. Therefore, HW collaborates with Community health workers (CHW) to improve and maintain the health of communities in their environment.

CHW has the job of carrying out health management and services at the Pos Pelayanan Terpadu (Posyandu), a place for health services managed directly by the CHW. HW directly supervises the implementation and reporting of this activity from the PHC. Unfortunately, their report from Posyandu is still delayed, especially in reporting and accessing information[3]. Consequently, it created decision-making and policymaking in health service delays

[4]. Therefore, the iPosyandu application, a Mobile Health application (mHealth apps) platform, was created to fill this gap by helping CHW easier and faster collect and report the Posyandu data. However, the use of iPosyandu has not been fully accepted by CHW[5].

There are unique challenges when CHW transforms to adopt digital technology in health service, such as an issue with internet connectivity, management costs, poor sustainability of the pilot project, week of technical support, including challenges related to management[6]. Previous research suggests finding strategies to improve CHW adoption of mHealth apps in low and middle-income countries [7]. Service, better known as Service science, management, engineering, and design (SSMED), is one of the ways to find strategies to improve adoption in CHW. Service Science (SS) can be integrated in various fields of science, including being used to solve management and technology problems[8]. Although most service science concepts are widely used in business strategy, SS can be used in fields such as mapping, social and disaster management[9]. Therefore, this study aims to analyze the strategies that can be used to increase the acceptance of the iPosyandu application at CHW based on a service science perspective.

Acceptance iPosyandu in Community health worker

Acceptance of technology is the user's willingness to employ technology for tasks designed to support them [10]. Technology acceptance itself is often associated with technology acceptance theory, such as the Technology acceptance model (TAM)[11] and the Unified Theory of Acceptance and Use of Technology (UTAUT) [12]. However, the test results from the examined model theory had different results in any study depending on the region's conditions and characteristics [13]. Therefore, a deeper study is needed to find strategies to increase technology acceptance because analysis using the quantitative method to test the acceptance of iPosyandu cannot describe the acceptance more profound.

Technology acceptance among CHW was still relatively reluctant to use[14]. Hence, exploring the strategy to solve it was needed because Community Health Workers (CHW) have an essential role. Community Health Workers (CHW) or Cadre is a community whose members come from the community to serve community health

care on the frontline[15]. They give the service to the people who can be underserved and generally from the communities themselves. CHW is essential in maintaining the community's health in their environment. One of CHW's tasks is to participate in providing health services for mothers, children and even the elderly at the Posyandu. To optimize CHW's performance, they need technology support, one of them using a mobile health (mHealth) application.

mHealth itself has been widely applied globally and provides many benefits. Earlier research conducted in Pakistan, show the use of mHealth by CHW can benefit the community by improving illness management in children[16]. mHealth also can support CHWs in Uganda, Mexico, Liberia, and Ghana, to tackle COVID-19[17]. The study in Kenya, mHealth can be used by CHW to screen residents' cardiovascular risk[18]. In Indonesia, mHealth can speed up and make it easier for CHWs to input and report data [5]. In India, the use of mHealth can make CHW more confident in dealing with pregnant women with preeclampsia so that the interaction between pregnant women and CHW increases[14].

The innovation presented by the mobile Health service platform (mHealth) in Pasawahan district, Indonesia, was iPosyandu (Figure 1), this application was created to assist CHW in inputting, reporting and monitoring maternal and child health, either from the results of Posyandu activities or home visits. Other functions of iPosyandu include; allowing access to data previously done manually in the book. As a reminder for both CHW, midwives and parents regarding the Posyandu schedule, as a means of CHW education, it is possible as a community diary, and the data is only personal for everyone who does the examination, clinical family health history, service scheduling can be done via cellphone.



Figure 1. iPosyandu Platform

The data inputted by CHW is integrated with iPosyandu for parents and can be viewed by PHC and the government (Figure 2). Then, parents and CHW can routinely monitor and evaluate Posyandu data, such as the results of weight, height or immunization status. This monitoring is carried out directly by health workers (midwives and nutritionists) who work in PHC. If health care problems are related, it will be easier for health workers to provide intervention because tracking can be done more easily and quickly. Also, the list of toddlers recorded by the cadres will be used by the midwife to prepare the number of vitamin A capsules to be given and can even monitor whether the appropriate immunizations have been given. However, there are still cadres whose acceptance in the use of the mHealth/platform is not maximized[5]



Figure 2. iPosyandu data integration (kompasiana.com, 2022)

Several obstacles prevent CHW from using mHealth, such as lack of training, weak technical support, issues of internet connection, and other administrative and management challenges[7]. Then, this application has not been used in all CHW, it can be seen from the number of applications only used in certain areas. Therefore, there is a need for strategic management in overcoming this problem, considering that it will provide great benefits if implemented optimally.

Service Science

Service-Dominant Logic (SD-Logic) an important theoretical framework in developing the concept of service science[19]. This concept is different from the traditional concept, which approaches service and exchange. Service science itself can be defined as a transdisciplinary systems approach to learning, scaling, creating, improving, and innovating service delivery by interaction[20]. In this study, we define service science as value co-creation, as the beneficial change from the results of planning, communication, or knowledge interaction between different service system entities, such as individuals, institutions, technology, organizations and nations, where these form a service Systems [21].

The concept of value co-creation reflects that value is

not created exclusively by an individual or group [22]. Each actor in the interaction has a different value[23]. Consumers/users have an important role in shaping a company's value. These values are expected to create a customer and make the company able to continue to run and survive in any condition or situation.

The participation of customers or users in co-creation can be formed in 2 ways: customers can contribute by sharing their views with the company (indirectly), or they can be directly involved (directly) in the value creation process[24]. The value co-creation has two layers (Figure 3). This layer shows the value co-creation process and the interaction between customers and providers to "get on board" to create shared values and mutually control, called the value orchestration platform[25].

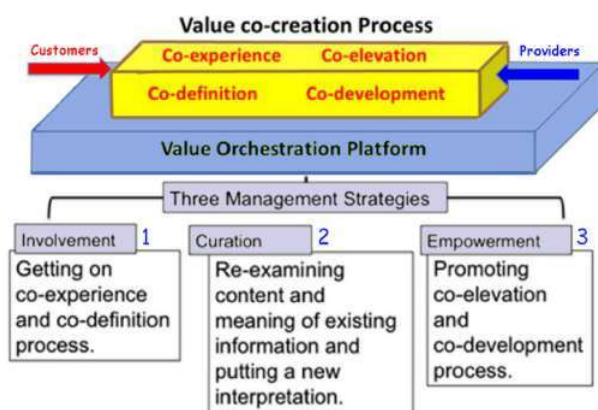


Figure 3. The 2-layer concept of the management strategy of value orchestration (Adopted from Kijima&Arai, 2016)

This platform will be successful if two parties participate. Many services are provided using a two-sided platform, especially the Internet like iPosyandu. This process also explains that customers/users can evaluate and assess the value, and providers learn from user responses. Value orchestration platform facilities and new value co-creation made by providers and customers are divided into four co-phases, while the orchestration strategy is divided into three phases. [25], namely:

1. Involvement Strategy

The strategy is to invite consumers and providers to share experiences (co-experience) and understand each other (co-definition) about the service or product produced together.

2. Curation strategy

Strategies how to interpret/package new services/products produced by re-examining the content and meaning of the existing information to be sustained.

3. Empowerment Strategy

This strategy aims to promote co-elevation and co-

development (assessment from consumers and learning providers to respond).

For the matrix strategy in value orchestration, the co-experience and co-definition phases are only in the involvement strategy phase [9], in social communities, the second and third strategies are crucial. Therefore, researchers try to develop curation and empowerment strategies using the iPosyandu context.

II. METHODOLOGY

This study uses a qualitative method which is a process to capture reality to understand a social, cultural and other phenomenon [26], with an abductive approach. The data used are primary and secondary data. Primary data is obtained from FGD results, and secondary data is obtained from developer data of the list data that CHW has input. This research conducts the primary data with focus group discussion (FGD). The FGD was conducted to explore gro information regarding the interaction and value creation process at CHW, based on the perspective of CHW as a customer and Health worker as a provider.

Based on the value co-creation process, stakeholders sit together to share their internal model and find out their needs and capability. The FGD data was collected from 12 CHW from each village, village midwife, nutritionist, and midwife coordinator carried out on April 14, 2022 in Pasawahan sub-district, West Java, Indonesia. The questions given refer to service science in previous research [27][28]. They discussed each other's complaints, expectations, and desires in this discussion. Before the FGD, researcher asked for a signature on the list provided, which stated that FGD members were willing to participate in this activity and were informed about the importance of holding this activity.

The researcher recorded it via cellphone video and audio recording during the discussion process, which the participants had previously approved. Furthermore, the coding and grouping process is carried out using content analysis techniques with NVivo Seal software. After the code is obtained, the analysis is conducted based on service science. The FGD ware used the Indonesian language, so the researcher changed it into English after analyzing this article. The code uses thematic for analyzing qualitative data, which entails searching across a data set to identify, analyze, and report repeated patterns.

Based on the FGD results, it can be described that CHW has problems related to the ease-of-use iPosyandu when operating the application. Second, the application lacks efficiency because it has not integrated with another application. Third the lack of involvement of the government's role in the operation of iPosyandu. Then it

will make innovation development more difficult because there is no obligation to use and a sense of ownership. This FGD resulted in a solution to advocate for local governments to support CHW in using applications. Based on the deal of all participants, they agree to use the iPosyandu application if a platform is developed and has government policy support.

In addition to FGDs, field observations were carried out to see the value co-creation process and interaction between CHW and health workers in the field to solve the problem and the resolution together. In addition, a survey was also conducted on iPosyandu users by distributing questionnaire.

III. RESULTS

iPosyandu is a digital health platform used in the Posyandu research area. Many other Posyandu applications can be used, but they are still regional, and their sustainability is unknown. iPosyandu and other Posyandu applications can be viewed and downloaded (<https://play.google.com/store/search?q=posyandu>). On the play-store, the lack of reviews given regarding the application. This shows obstacles in the first to the second phase in creating new values of iPosyandu. Therefore, there is a need for a strategy that can make the iPosyandu application continue can be used by all CHW in Indonesia.

Secondary data obtained from iPosyandu developers found that those who fill iPosyandu are CHW that have received training, the government has been invited to collaborate by developers, and Posyandu cooperates with the private company (Astra) that oversees this application. The FGD results found that the government’s role in providing health policies was crucial. One CHW said, “I am not required to use the iPosyandu, so I donnot want to use the application unless there is any research come, or there is a certain moment when I have to use it.” This statement is one of the reasons why CHW do not use the application because they need someone to tell them to use it. Then, creating a new value was a need

The researcher analyzed the result of FGD compiled using a two-layer service science strategy to understand what providers and customers expect about what they want and need. Service is co-creation among entities in a service system. The service provided by iPosyandu is to facilitate communication between CHW and health workers in reports on the implementation of Posyandu activities.

Based on the discussion, to see CHW perception of the current platform, a questionnaire was made using the Linkert scale and involved 35 random respondents. Based on thematic analysis, the writers identified five important

issues of the use iPosyandu (Figure 4). The following is a ranking of issues regarding the iPosyandu feature, which can be seen in the following image

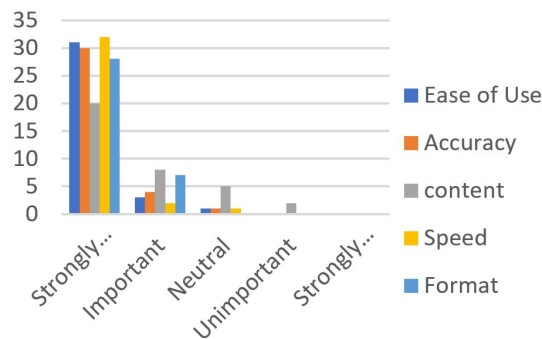


Figure 4. Result of Questioner

In distributing the questionnaires and the results of the FGD, which was the highest speed, CHW suggested that the server be updated so that the data input process was faster. The second is easy to use, so the design format must be as simple as possible. The three applications must have high accuracy, the data entered and viewed is correct, and the information provided is interesting. The four formats in the application are made as simple as possible to avoid repeated input and are more comfortable to see. The last is content, which includes completeness of content and information

IV. DISCUSSION

The results of FGD show have required management by the government in managing and developing information, where the orchestration is an institution outside the government. Currently, the government’s activities are only limited to receiving data and giving permission to use applications without being directly and continuously involved in developing iPosyandu.

The iPosyandu platform needs to be developed according to the needs of each stakeholder involved in Posyandu activities. In other words, this platform is expected to be a forum for all stakeholders to develop innovation. In the proposed platform, there are three management strategies of value co-creation and four value orchestration processes, following

Value co-creation process in Community health workers

1. Co- experience and co-definition

Sometimes customers and providers do not know their expectations and capabilities. The co-experience phase seeks to reduce this gap regarding seeds and needs.

Consumers and providers share their internal models related to service, and an understanding occurs, so customers understand the direction and the provider understands customer preferences and needs in service. It called co-definition.

In this process, CHW and health workers need to know how to use the application and what data needs to be inputted. They need to have an experience after using iPosyandu. For example, CHW and midwives discussed after using iPosyandu the completeness of the data, lists of mothers, infants and toddlers, and what obstacles were encountered in collecting data. Co-experience was an agreement between the CHW and midwife on how satisfied and easy the iPosyandu with co-experience and co-definition in collecting the data.

2. Co- elevation process

Co-elevation is a reciprocally led process by the provider and customer in the system. Therefore, there is a zig-zag process between user expectation and provider availability. The high level of service will increase the expectations of the user. In this process, the health worker conducts training and evaluates the inputted data using iPosyandu.

3. Co- development process

The co-development process pays more attention to co-innovation, which results from simultaneous collaboration from various entities, namely customers and providers. At this stage, customers evaluate the value of the providers' learning outcomes from their responses. Besides that, collaboration needs to be carried out at this stage. For example, at this stage, the provider and user try to give direct input to developers regarding the ease of use of the application or advocate with the local government.

Value orchestration

The value orchestration phase tries to make customers and providers "get on board" to interact and facilitates customers and providers to hold the process and control. Facilitating the co-creation process requires value orchestration to find strategies to increase the use of the iPosyandu application.

1. Involvement strategy

Involvement strategy is how to create customers dan and providers "on board" with the platform and vitalize interactions between them. This strategy attracts and involves customers dan providers to maximize the profit order is crucial. A cycle of Sympathize, Identify, Participate, and Share and Spread (SIPS) is used to identify how customers and providers are interested in the platform. In general, how they are interested in iPosyandu. This strategy shows that CHW requires an integrated platform

and is easier than government applications. This study needs to experience using the iPosyandu application to them, including giving the CHW promotion and training.

In addition to CHW at this stage, it also applies to providers because the provider's intentions are reduced because they feel that the iPosyandu filled by CHW does not help optimally. After all, it is not integrated with government applications. Then, they still have to transfer data to government applications as reports, so they feel less efficient

2. Curation Strategy

Curation strategy can be defined as a highly proactive and selective value co-creation in collecting, analyzing, selecting, and reviewing the meaning of services and information to create a new meaning for them. This strategy is mainly used to challenge customers and providers to co-elevate and co-develop.

The FGD results also showed that this strategy could be developed using co-experience and co-definition processes. For example, CHW argues:

"There are so many applications it makes me confusing, and included e-pggbm owned by the government, so we add more work. Why is there no data integration, so we can choose which one to use?. Because e-pggbm had a follow-up by the government, we have referred still used manual recording first because more simple. If there is an evaluation about iPosyandu, we will convey the same thing because our complaint is not realized to have integrated application".

Based on this statement, we can see that their experience will increase and give new meaning if the government provides a policy on using applications. The perceived policy support was needed to have resource integration and beneficiary of the exchange (Figure 5). Without a policy, this strategy cannot work. In the future, the value orchestration strategy can be focused on this stage first because it is still not working in CHW.

3. Empowerment

Theories that exist specifically other aspects of empowerment are co-elevation and co-development. Especially how active customers and providers have the same motivation to interact together. Using the cycle of SIPS, we can see how to increase application acceptance using co-experience and co-definition processes. There is a CHW that says:

"At the time of the competition, I thought only the books I saw were judged. If I knew, I would use them to get additional points."

The health worker gave his statement:

"There is no follow-up from the government to us, so whether to use it or not has no effect. So I cannot force them to use iPosyandu."

From these, interactions that can be strengthened will occur if both parties are given clear rules and regulations from the government, especially if they get an award, which will make them even more excited.

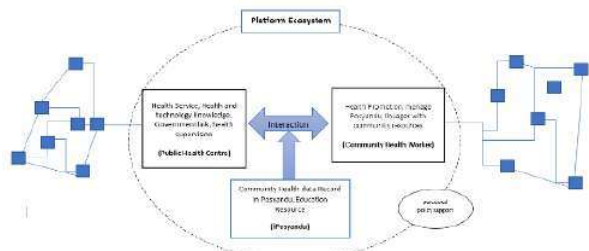


Figure 5. Incorporating the service system

Referring to current internet trends, the mobile application supporting their duty is the best. Health applications containing government programs' data are required to provide data on their activities, where health workers who act as providers carry out routine reporting to the government. The government report application, namely Pencatatan dan pelaporan Gizi berbasis masyarakat (e-PPGBM) application for data on maternal and infant nutrition and e-Kohrt (data on the development of pregnant women). The advantage of this application is that iPosyandu has loaded all the data in e-ppgbm and e-kohrt. The weakness of iPosyandu is that there is no integration between iPosyandu and government applications. If the iPosyandu has been integrated and fixes important issues in the use of the application, the iPosyandu will be able to be used even though no policy regulates it. There need to be clear regulations so that it can meet the expectations of all stakeholders, such as cadres it is easier and faster to report, midwives can more quickly and easily monitor CHW and report to the government, and finally, the government gets faster and more accurate public health data. The next development is the platform itself.

The platform innovation model that needs to be developed is divided into two: backstage and frontstage. Backstage is an application with data developers owned by each division, and frontstage is an application that interacts directly with CHW. In the iPosyandu application, each menu is developed to improve Posyandu activities. In the dashboard menu (Figure 6) there is an accumulation of the number of children, pregnant women and women of childbearing age and a graph of the number of visits. This menu provides automatic data accumulation from the amount of data for toddlers and pregnant women



Figure 6. Dashboard of application

Figure 7. It Shows data on infants, toddlers and pregnant women, where the results of examinations at the Posyandu are included in this data. It would be better if this data were integrated with each CHW account who work in the same Posyandu. Also, the data entered can be integrated directly with government applications.

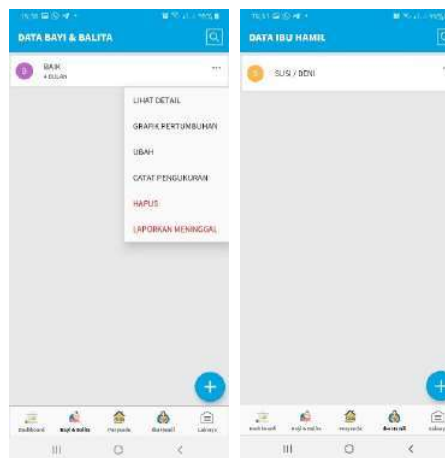


Figure 7. Form to input and list of pregnant women and children's data

Figure 8 shows the calendar and surveillance of the Posyandu implementation, this Posyandu data is better if it is connected to the iPosyandu application for parents and midwives.

V. CONCLUSION

The value co-creation process and value orchestration platform were offered in this work among CHW. We used iPosyandu as the platform for customers (CHW) and providers (Health Workers) to communicate with each other. We anticipate that the mobile app will serve as a helpful platform for customers and suppliers to communicate. As a result, there are a variety of inputs for developing innovations, such as connecting with government apps and reviewing existing features.

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Figure 6. Dashboard of application

Figure 9. contains Health education videos for CHW which will be more accurate in providing education. In addition, menus fill in data on couples and women of childbearing age, Pasangan Usia Subur (PUS) or fertile age couple and Wanita Usia Subur (WUS) or women of childbearing age which contain data on contraceptive acceptors. There is also a draft report which is usually filled out manually. Account settings and help menu which also contains what's app number if there are problems. This application is complete enough to provide education, but the position of the list of women of childbearing age is separate and there can be one menu option to enter data such as a list of pregnant and toddlers.



Figure 9. option menu on the application

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