REACHING THE POOR USING ICT: THE CHALLENGE IN DEVELOPMENT AND IMPLEMENTATION OF MOBILE APPS FOR INTEGRATED REFERRAL AND SERVICE SYSTEM

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Abstract—**Integrated Referral and Service System (IRS/SLRT) designed to resolve potential fragmentation and lack of coordination between national and local social protection programs. It also aims to update national poverty data more frequently and providing local government with tools to encourage better coordination of social protection programs implementation at the local level.**

As it cores system IRS built a comprehensive Management Information System (MIS) consisting of three main modules, i.e., mobile application (apps) module, web-based modules, and dashboards. The apps become the main tool for facilitator in village level to meet the poor and collect their administrative data update, social program participation data, and recording complaint of the program conduct.

This paper describes the development of the mobile apps module and analyzes the challenges faced in the system development and implementation when authors involved in the development of the module. It is found that the challenges are not only on the technical/ICT aspect only but also in MIS project management, in the implementation environment as well as in the ICT4D policy aspect.

Keywords—mobile application (apps); facilitator; project management; development challenges; implementation challenges

I. INTRODUCTION

The Government of Indonesia, under the leadership of Indonesian National Development Planning Agency (Bappenas) and the Ministry of Social Affairs, is creating a program, Integrated Referral and Service System (IRS/SLRT) with the aim of improving coordination and integration of social protection and anti-poverty initiatives at the local level. IRS proposes to address possible fragmentation and lack of coordination of national and local social protection and anti-poverty programs. It also aims to update poverty database infrequently and the regular way by providing local government with tools to encourage better coordination of programs implementation at the local level and to make the programs more responsive and relevant to local needs.

In the 2015-2019 National Medium-Term Development Plan (RPJMN), the Integrated Service and Referral System (SLRT) has been established as one of the targets in the Field of Poverty and Equalization [1]. This IRS implementation is expected to help achieve the goals of sustainable development. Referring to the RPJMN, IRS is part of 2016, 2017 and 2018 Government Work Plans (RKP) which are the responsibility of the Ministry of Social Affairs in its implementation. The Ministry of Social Affairs in its Strategic Plan will develop IRS in at least 150 districts by the end of 2019.

IRS is one of an initiative by the Indonesian government in its effort in poverty reduction. IRS aims to help tidentify the needs of the poor & vulnerable and direct them to the most suitable national and local programs to meet their needs. IRS also facilitate implementer in identifying complaints of the poor and vulnerable, make a referral, and keep track of the complaints to ensure that the complaints were adequately addressed. It manifested in its four main functions :
(1) Integration of information, data, and services;
(2) Identification, referrals, and handling of complaints;
(3) Identification of program participation and needs
(4) Dynamic data updating by local government

MIS in IRS is categorized as an ICT4D, Information and Communication for Development, initiative. ICT4D represent the usage of technology to help deliver on the international development agenda [2, pp 19].

II. RELATED WORKS

There are currently some initiatives related to the updating of data for the poor in Indonesia in a national or regional scope [6-9]. Three of them are IRS (Ministry of Social Affair/MOSA),

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Independent Registration Mechanism (MPM, TNP2K), and Social Welfare Information System-New Generation (SIKS-NG, MOSA). The similar independent data update also performs by national social protection programs such as PKH (Family Hope, Conditional Cash Transfer) and PBI (Social Health Insurance). Basically, all the system uses data UDB (Unified Database) [10, 11] and shared the same data of the poor and vulnerable (the lowest 40% poorest population). The expansion of the program that originally uses the same data but updated by different verification and validation using different systems makes the data not synchronized and have more and more discrepancies.

When this paper written, the effort of unifying all the update in a more frequent and centralized way is still in coordination between MOSA, the of ministries that manage social protection programs (such as PIP by Ministry of Education and Culture and Ministry of Religious Affair, and National Health Insurance JKN by Ministry of Health), and TNP2K, the National Team for the Acceleration of Poverty Reduction under Indonesian Vice President Office who were managing UDB. The insufficient coordination in the validation and verification of this data left programs and local governments develop different initiatives to update the data. Local governments usually have regional local programs (in province, districts, until village levels) in implementing it they need the ability to manage the latest poor and vulnerable data. As the closest authority it is make sense that the local government should have this update capability.

III. Methodology

The paper described two things, the development and implementation of the MIS system for IRS, particularly apps part, and the analysis of the MIS challenges in the development and implementation of the system in IRS districts. This research activity is shown in Figure1.The analysis is based on the experience in developing and implementing information system in IRS, where one of its main components is apps. The analysis also considering feedback from users during around two years implementation of the system, until June 2018.

The overview of the business process of IRS shown in Figure 2. A facilitator meets the village resident and performs their task by first checking their name in the village database

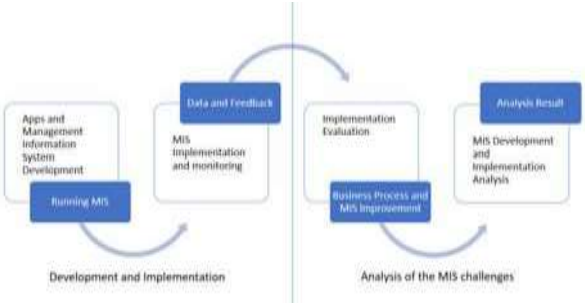

Figure 1. Research Activity within IRS's MIS Development and Implementation

Figure 2. IRS's Business Process

that already installed in the tablet, associated with facilitator's username. If their name exists, the facilitator will check if there is any update on the household and family data against variables in the apps (based on UDB Update questionnaire). If the name is not found, they will be interviewed for the eligibility (according to poor criteria) and the data will be recorded and proposed for program participation, along with the social protection programs that suitable with their needs and condition. If they already received programs, they can also record their concern or complaint on the quality of the programs they received. IRS system then will play the roles of addressing the complaints, locally and if it cannot be solved, referencing them to the respective programs (PKH, PIP, PIS, etc.) for follow up

IRS uses UDB [10,11] data that also use by other national programs like KKS (Social Welfare Card) [9], PKH (Family Hope Program) [12], and KIS (Indonesia Healthy Card) [13, 14]. The data in the system is based on UDB forms managed firstly by Indonesian Central Bureau of Statistics (BPS) and now managed by Indonesian Ministry of Social Affair who authorize the data update [15]. The stakeholders of IRS are MOSA and its local social affairs offices (dinas), National Secretary of IRS, Indonesian National Development Planning Agency, social protection programs management, and their respective ministry, and the contractor and funder.

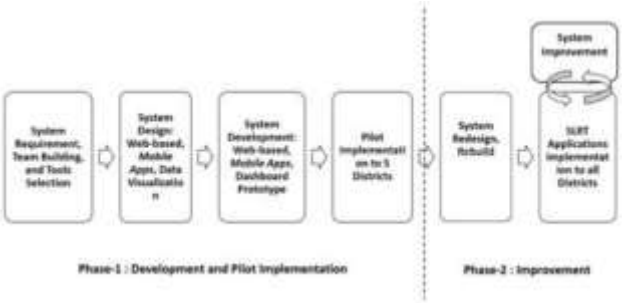

Figure 3. Mobile apps and MIS development methodology for IRS

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IV. The Development of Mobile Application module

The development of the MIS itself system underwent two phases as shown in Figure 3. The first phase was development and implementation to 5 pilot areas and the second, improvement phase. When IRS started, the responsible person for MIS activity started developing system requirement based on the IRS program design. Together with developing a prototype on core functions, he designed and developed the system with the team. The system is implemented in 5 selected districts based on some socio-technical consideration by the ministry. After almost a year of pilot implementation and the program become more institutionalized in pilot areas, the system evaluated by new MIS team, to prepare for scaling to other 60 new districts. The improvement is more on technical side of the software where database and backend development are redesigned and refined.

The IRS MIS system consist of three modules: (a) Android mobile application (apps) for *Facilitators* users at the village level; (b) Web-Based applications for *Manager* at the district Secretariat Office, *Supervisor* at sub-district level and *Front-Office, Back-office officer* at Social Welfare Center (Puskesos) in village level; and (c) Dashboard module for all user level from village to national. The development of dashboard module described in other paper [5]. The overall MIS module is shown in Figure 4.

The MIS users categorized in three types by region representing one data input level in village and two levels of review in subdistrict and districts. The users for these three levels called facilitator, supervisor, and manager respectively. In the implementation package from APBN (The Indonesian Budget), the number of users in each district are 50 facilitators, 3 supervisors, 1 manager, and 1 person for front office, back office, and the office manager. Puskesos is only implemented in two selected villages in every districts and local government are encouraged to expand the Puskesos to all villages using province or districts APBD (Regional Budget).

The apps were built to implement the main IRS objectives and entry and update data into the system:

Figure 4. IRS's MIS Module

(1) Identification of change in administrative data of individual, family, and household of the poor;
(2) Update of social protection program participation and identification of needs for both national or local social protection programs if they have not participated in the program;
(3) Recording and addressing complaints on the quality aspect of the program for who participate in a program

Initially, the system filled with household data from the Unified Database (UDB). Each tablet assigned to facilitator representing one or more villages in their areas. Based on the data in the tablet, each facilitator can verify and validate the administrative data of the household/family member, record the program participation, identify program needs, and record the complaints. They also become the front liner in helping the poor, to help them getting support from one single system, IRS.

Considering the users skills, IRS mobile apps designed with the concern on ease of use, memory usage, battery consumption, GPS, and network connection. While gestures, sensors, and location data may be used in personal computers, they play a dominant role in many mobile applications [2]. The technical characteristics of these devices – including processing power, memory space, battery capabilities and the operating system – also play an important role. The specific demands and characteristics of selected target devices need to be carefully considered in apps development [3].

V. The Implementation of Mobile Application module

Until June 2018, IRS has been implemented in 78 districts in Indonesia, including districts that fully funded by regional government budget/APBD, and currently being expanded to 60 new districts. With minimum 50 users in each district, the users of the apps reaching at least 3900 users. Each IRS district secretariat has the freedom to add the tablet using their own budget, and this is encouraged because ideally each facilitator only serves maximum one village or, if possible, around 200 households within a reasonable distance. This means that one village, a dense village or a wide areas village can be supported by more than one facilitators.

The menu structure describing the apps functions and the screenshot of the main page of the apps are shown in Figure 5 and Figure 6 respectively. The apps have database of village population (Population Data menu) where user can add new household or family (F1), doing data verification and update the data (F2), Registration of Program Participation (F3) to be proposed to the Program Management, identification of Program Needs (F4), and Complaint recording (F5).

Before each implementation, there is a Technical Assistance Training for each district that attended by all users. After a try-out period, user can started to work immediately. To support the smooth implementation, the National Secretariat builds a help desk team. A help desk application, whatsapp

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group, email, and call support is provided to help user mastering the apps usage, where the team also collect feedback from the users.

VI. Analysis and Discussion

6.1 Development Challenges

As a core system in IRS initiatives that implemented in wide areas in Indonesia (5 pilot districts, 60 first batch districts, 18 some independent districts until June 2018), the developer team experience challenges in delivering product to support the dynamic implementation of the program. The tight deadline, short period of team building, the high turnover among development team member are some challenges faced by the team. The first apps version approach developed by previous team is one of the main challenge, as it later must be rebuilt (database, design, application, backend part) because of immature initial design of the system. It is understandable why this is happened as the system must work as soon as possible with limited human resources, so it may bypass some ideal requirement in developing a management information system.

The difficulties from the system development aspect is managing the MIS team human resources. As a program with short period duration that choose internal application development option (instead of hiring IT Consultant), IRS must manage all related resources issues (selection, test, hiring, firing, etc.). The team also experiencing very dynamic situation where some turnover happened in a relatively short period of time. The team have to allocate sufficient time to travel to deliver training, perform help desk function to support application users, monitor the current implementation while has to do application development and maintenance at the same time.

It is also not easy to ensure other unit and management in getting sufficient support in the delivering the system optimally. This is also proving the risk of inadequate communication between MIS teams with management and contractor. The system also requires interaction with various local systems in some districts, MIS from social protection programs, and with LAPOR! as the default complaint handling mechanism for some social protection programs (PIP/education, PIS and BPJS/health, Rastra/subsidized rice). The intense communication of policy level is required to support the technical team implement the integration between systems.

6..2 Implementation Challenges

After almost two years of implementation, there are still challenges in the implementation of programs. They can be categorized as technical-related, environment-related, and policy-related. Technical-related issues come from the technical aspect of the software. The environment-related come from infrastructure and geographical location in the implementation area. While system can be used in offline-mode, it still need to be synchronized periodically to submit data to the main server in Jakarta. Some remote village in Indonesia still lack in but also, this is a generic cause of mobile implementation. ICT simply cannot function without two types of infrastructure: electricity, power infrastructure and telecommunication including wireless network [2, pp 43].

The maturity of the mobile apps or MIS in a whole was influenced by the dynamic natures of poor data updating ecosystem. The interaction with users from all districts also raise some local needs that sometimes need to be addressed promptly to gain their support in using the system. The existence of similar systems (with or without applications) also result in a confusion for the district users. They have to do double entry for different system, use one system only and ignores the rest, or needs of a intersystem integration,

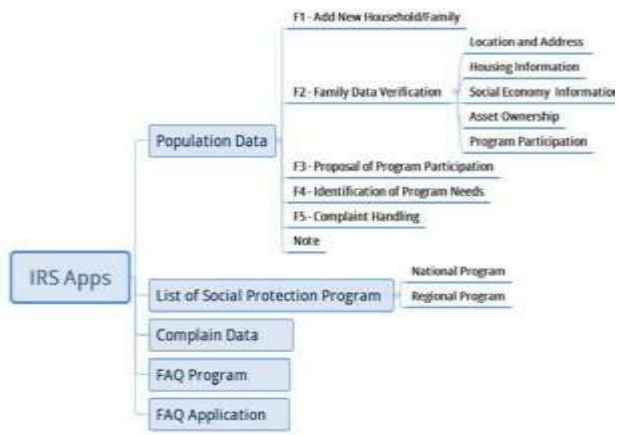

Figure 5. The apps menu and function

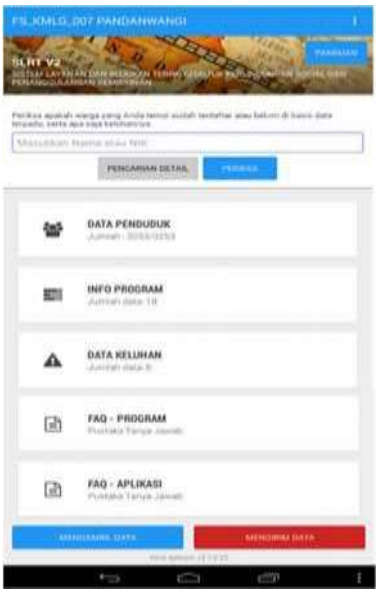

Figure 6. Screenshot of Mobile apps Home Page

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transferring data from/to IRS with other system. This technical requirement sometimes need long discussion and formal MOU between involving parties.

The most complicated challenge is when it comes to policy aspect. This is also mentioned by [2, pp 76] that stressing the importance of dealing with ICT4D policy issues. IRS present when there was no single system integrating function of regular and more frequent poor household data updating. When IRS in the second year of operation, there are a system with similar main function, household data verification and validation, that come in place and target to the same households. This kind of problem is beyond technical scope and no matter the quality of the application cannot solve the confusion in the user level in districts. Considering the above challenges, the system is facing sustainability issues, as they must meet three things that make ICT4D project sustainable: capacity, utility, and embedding [2, pp 118]

VII. Conclusion

Mobile apps have been developed as part of management information system for IRS. The system is continuously implement and scaled reaching target for implementation in 150 districts in 2019. Despite its potential as system that empower MOSA with the tools and mechanism to better outreach and serve the poor and vulnerable, IRS's MIS also faces some challenges. The existence of similar systems is one main challenge to be sustain. Although there is an option to adopt IRS as one of the system for data verification and validation, together with other systems, this option is not easy to implement. Synergy between IRS and other related systems still be a continuous discussion between stakeholders.

To maintain continuity in carrying out its functions, IRS must take strategic steps and closely coordinate with other stakeholders, especially between units in the ministry. The IRS must select a specific role among its basic functions while keep maintaining its superior position in reaching the poor and vulnerable. With current MIS and mobile apps capability, the potency to serve the poor better is still promising. On the other hand, no matter sophisticated the system and application, it will not effective without considering proper ICT4D policy in its implementation.

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