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P3P Blood Donation Program: Digital Transformation through Training, Mentoring, and Deployment at PMI Sukajadi

Nizar Rabbi Radliya [1)], Gurdani Yogisutanti [2)], Myrna Dwi Rahmatya [3)], Andri Sahata Sitanggang [1,a)], Novrini Hasti [1)], R Fenny Syafariani [1)], Febilita Wulan Sari [4)], Wahyuni [1)], Imelda Pangaribuan [3)]

[1]Department of Informatics Systems, Universitas Komputer Indonesia, Bandung, Indonesia
[2]Department of Public Health, Institut Kesehatan Immanuel, Bandung, Indonesia
[3]Department of Informatics Management, Universitas Komputer Indonesia, Bandung, Indonesia
[4]Department of Law, Universitas Komputer Indonesia, Bandung, Indonesia

[a)]Corresponding author: andri.sahata@email.unikom.ac.id

ABSTRACT

Many branch-level blood donation services still operate with paper-based workflows that delay verification and weaken emergency response. This program was designed and deployed a community-based digital workflow at PMI Sukajadi using a P3P sequence that consists of training, mentoring, and staged deployment. The solution connects a public mobile application for registration, schedules, reminders, emergency requests, and information with an officer console for events, verification, stock updates, notifications, vouchers, user data, and frequently asked questions. A pre- and post-questionnaire captured descriptive outcomes for community users (N = 50) and PMI officers (N = 6). Results are reported as percentages for unfavorable 1 to 2, neutral 3, and favorable 4 to 5. Among community users, favorable responses increased from 51.5 percent to 82.2 percent, with the largest gain on the emergency blood request flow at plus 40.0 percentage points. Among officers, favorable responses rose from 54.2 percent to 90.3 percent, with emergency requests and notifications increasing by 50.0 percentage points. Neutral and unfavorable categories declined in both groups. The deployment established auditable digital records and streamlined registration, scheduling, and emergency coordination. The findings indicate that a compact P3P pathway can deliver rapid and practical digital transformation at the branch level with measurable short-term improvements in usability and readiness.

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INTRODUCTION

Safe and sustainable blood transfusion services rest on a steady base of regular voluntary donors, supported by nationally coordinated governance to ensure availability, quality, traceability of donor data, and safe clinical use. Global policy frameworks emphasize unpaid voluntary donation as a pillar of a reliable and safe blood supply, and encourage the strengthening of information systems to support service decision-making. Recent findings also highlight a rising contribution from voluntary donors in low and middle-income countries, which makes the digitization of service workflows and record keeping increasingly relevant for safeguarding quality and emergency responsiveness (World Health Organization, n.d.)(World Health Organization, 2025).

Digital health technology-based interventions show potential to improve donor awareness, intention, and retention. Systematic reviews and recent studies report that mobile applications, short message-based reminders, and other digital media approaches can increase participation, accelerate scheduling, and raise the likelihood of repeat donation, particularly among first-time or irregular donors. Design principles that combine timely reminders, stock information, and streamlined registration flows are consistently associated with better donation behavior (Li et al., 2023)(Hu et al., 2022)(Pongsananurak et al., 2020)(Sharma et al., 2024).

In the local context, PMI Ranting Sukajadi faces operational challenges common to community donor services, namely paper-based registration and verification, scattered registration histories, coordination of emergency blood requests that relies on manual communication, and limited exposure to activity schedules. In response, this community service program designed and implemented an integrated donor service application with two-sided users, the public and officers, to organize data, streamline workflows, and increase repeat donor participation. Key components on the public side include account creation, access to schedules with reminders, event registration, emergency blood requests, blood stock viewing, donor event proposals, FAQs, profile management, and voucher redemption, while the officer side includes data management, voucher transactions, user management, scheduling, emergency blood information, stock management, and internal notifications (see Figures 1 to 6).

Conceptually, the P3P approach training, mentoring, and deployment are used to ensure directed and sustainable adoption. Training transfers knowledge and operational skills, mentoring provides onsite problem solving at the point of service, and staged deployment with iterative feedback supports the maturation of features and data policies. Drawing on international evidence about the effectiveness of reminders and mobile applications, and taking into account the local needs of the PMI Sukajadi Branch, this program targets two main outputs: auditable discipline in digital recordkeeping and improved service responsiveness, particularly in handling emergency blood needs and strengthening repeat donations (Li et al., 2023)(World Health Organization, n.d.).

METHOD

Program Design and Location

- Approach: P3P, which consists of Training, Mentoring, and Deployment. The stages are designed to be gradual and focused on the smallest feasible change that still delivers operational value, and are aligned with the needs of community-based blood donation services.

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- Partner and Location: PMI Ranting Sukajadi, Bandung City, as the partner and implementation site. The PMI office functions as the operational implementation site and the data center for donor activities.
- Targets:
  - ✓ PMI Ranting Sukajadi officers as data operators and managers.
  - ✓ The community as users of the application for donor registration, access to schedules and reminders, emergency blood requests, information on blood stock, and voucher redemption.
- Inter-stage outputs: orderly donor data, a faster and clearer registration flow, more responsive handling of emergency blood needs, and an increase in repeat donor participation.

Implementation Stages

Socialization

Objective: Align understanding of roles, service flows, and data policies before the application is run.

Core activities:

- Initial meeting with the PMI Ranting Sukajadi board to map manual workflows and identify pain points that occur in the field (paper registration, information delays, scattered donor histories).
- Demonstration of the application architecture on two user sides, namely the community side and the PMI officer side, along with the division of roles.
- Delivery of basic data governance that includes access authorization, input standards, and procedures for data correction.
- Outputs: minutes of socialization, a list of prioritized feature needs, and a role map for operators.

Training

Objective: Increase the operational competence of officers and improve literacy for using the application among the community.

Core activities:

- Training for PMI Officers
  - ✓ Modules: officer login, input and update of donor activity data, event management, registration verification, emergency request handling, blood stock updates, voucher management, FAQ, and officer account administration.
  - ✓ Simulation: create one donor activity, open registration, check participants, process attendance verification, trigger an emergency notification, update stock, and record voucher transactions.
- Training for Community Users
  - ✓ Modules: account creation, logging in, viewing schedules, registering for events, submitting emergency requests, checking blood stock, reviewing history, managing profiles, and redeeming vouchers.

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- ✓ Simulation: registration for one donor event and submission of an emergency request trial, along with reading notifications and checking history.
- ✓ Outputs: attendance list, training materials, active officer accounts, community demo accounts, and logs of successful practice tasks.

Technology Deployment

Objective: Run the application in real service scenarios that were previously carried out manually.

Core activities:

- Initial configuration: creation and verification of officer accounts, event scheduling, configuration of stock and voucher parameters, and activation of notification channels.
- Limited go live: one cycle of a donor activity is used as a pilot for registration through the application, verification of attendance, and recording of results.
- Integration of emergency flow: activation of the emergency blood request form and the internal notification flow.
- Outputs: the application is active for core services, a list of published activities, and the first digital transaction records.

Mentoring and Evaluation

Objective: Ensure operational stability, correct constraints, and evaluate early impact.

Core activities:

- On-site mentoring: the team is present on the service day to assist with registration, verification, and troubleshooting.
- Monitoring of early performance indicators:
  - ✓ Data orderliness: completeness of registrant attributes and consistency of national identity numbers or equivalent identifiers.
  - ✓ Service speed: time from entry to saved registration.
  - ✓ Emergency response: time from creation of an emergency blood request to notification being sent.
  - ✓ User adoption: number of active officers and community accounts, and the rate of registration through the application.
- Formative evaluation: feedback from officers and the community, identification of error logs, improvements to the interface, and data input policies.
- Outputs: a formative evaluation report, a list of improvements, and an updated configuration version

Program Sustainability

Objective: Maintain operations after mentoring and facilitate replication.

Core activities:

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- Appointment of a local admin and daily and weekly operational SOPs.
- A short self-learning package that contains a short video, step-by-step guidance, and an FAQ for officers.
- A schedule of periodic online technical clinics for light assistance and review of indicators.
- A replication plan for subsequent donor activities and to other PMI branches after evaluation
- Outputs: SOPs, an active admin account, a self-learning package, and a documented replication plan.

RESULT AND DISCUSSION

Preparation for training

The activities to prepare the training were carried out in two parts, namely internal and external. The internal preparation consisted of (1) discussions among the research team regarding the duties and responsibilities of each member of the implementation team and the students, and (2) preparation of the technology that had been developed. Preparation with external parties then continued with on-site observation together with the head of the PMI group. The agenda comprised (1) conducting discussions and dialogue, (2) structuring the problems, (3) formulating solutions, and (4) submitting the proposed solutions. These activities aimed to ensure that the application that had been developed matches the needs of the groups. The activities can be seen in the following figure. (Andri Sahata Sitanggang et al., 2024; Sitanggang et al., 2022, 2024; Syafariani et al., 2024).

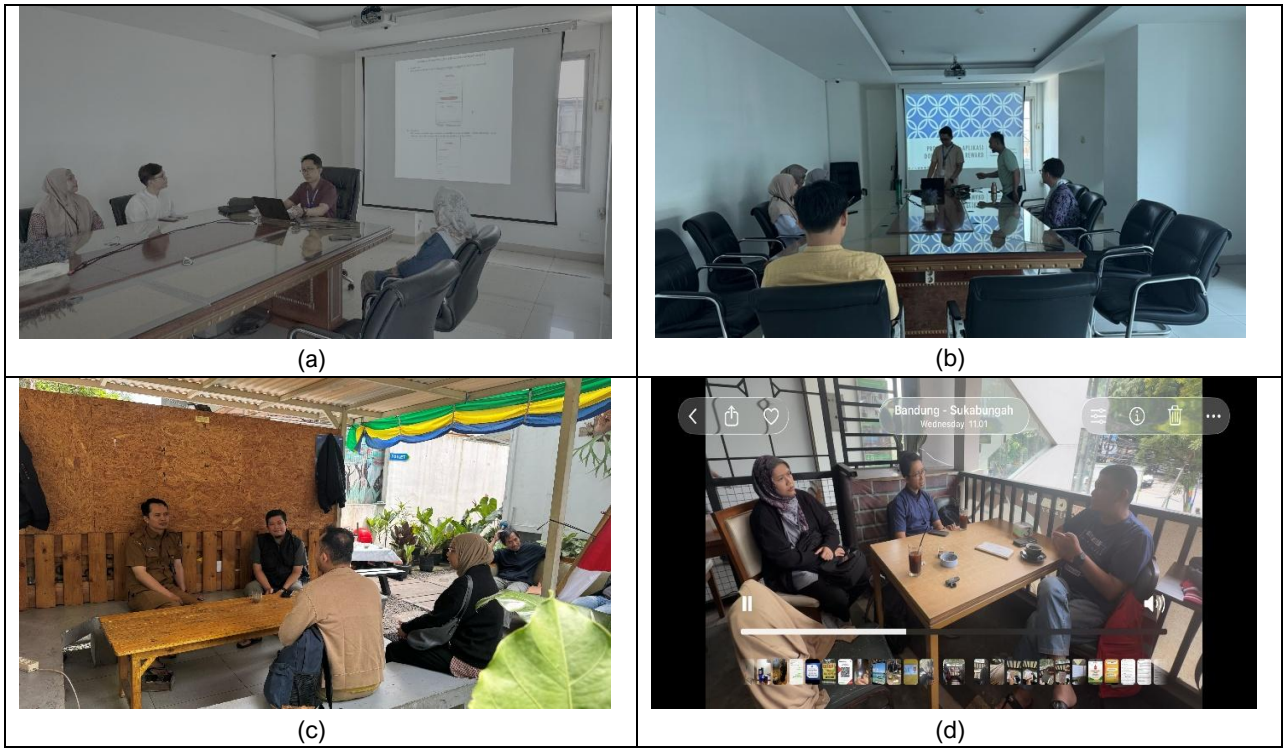

FIGURE 1. Discussion and preparation before training activities

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In Figure 1, panel (a) shows the community service program lead explaining the problems experienced by the partner and the technology that will be applied for PMI Sukajadi and the Sukajadi community. Panel (b) shows the program lead mapping the duties of the implementing team members and the students who will be involved. Panel (c) shows direct on-site observation at the community service location with a discussion among the Village Head, the Head of the PMI Sukajadi Branch, together with the chair and members. Panel (d) shows the activity of agreeing on the technology and aligning the date for the implementation of the community service.

Implementation of the Community Service Activities

This community service activity was carried out in person, both for the preparation of the training and for the training and mentoring activities themselves. The activity took place from 10.00 a.m. to 2.00 p.m. Western Indonesia Time. The opening was led by the master of ceremonies with greetings, followed by opening remarks from the program chair, Nizar Rabbi Radliya, S. Kom., M. Kom. After the opening session, the event proceeded to the main agenda, namely the training delivered by the trainers. The trainers consisted of four people, namely Muhammad Azhar, Sahkru Adrian, Pasya Fakih, and Valistro Candra. The activity was followed by the handover of technology in the form of a digital stethoscope and blood bags to representatives of the PMI Sukajadi Branch, and a group photo was taken. The training consisted of training and mentoring on the use of the application. The training activities provided to the community group are shown in Figure 2.

(a) (b) (c) (d)

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FIGURE 2. Training and Mentoring Activities

In Figure 2, panels (a) and (b) are the opening activities led by Andri Sahata Sitanggang as the master of ceremonies, followed by remarks from the community service chair, Nizar Rabbi Radliya, S. Kom., M. Kom. These remarks also marked the start of the training and mentoring for the PMI managers. Panel (c) and (d) shows the training session opened by Muhammad Azhar with instructions on the mobile-based application. The training covered several modules, namely Login, Register, Home, Donor Activity Schedule, and Registration Details. Each PMI manager was accompanied by one student. For the PMI administrator side, the training was delivered by Pasya Fakih and covered functions or modules such as Staff Login and Home, Voucher Transactions, Goods Vouchers, User Data, Donor Program Information, Donor Event Proposal Submission, Emergency Blood Information, Blood Stock, Notifications, FAQ, and My Account. After this session, there was a handover of items to representatives of the PMI management team, namely, technology needed during PMI processes. It then proceeded to panels (g) and (h), which are group photos of the community service team with the PMI Sukajadi Branch management team.

Technology Deployment

In this activity, PMI administrators processed operational data, beginning with entering manager identity information, donor activity data, and verifying donor records. This management is shown in Figure 3.

FIGURE 3. Technology deployment

In Figure 3 panel (a), it is explained that when a donor registers for a donation event, the event has been created by PMI on the administrator side. For every event held by PMI Ranting Sukajadi, each donor who is already registered in the application will receive a notification about the upcoming donation activity. In addition, each donor will receive reminders to donate again. Panel (b) is the page for PMI administrators to manage operations, which consists of PMI activities, emergency services, voucher

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transactions, goods vouchers, user data, donor program information, donor event proposals, emergency blood information, blood stock, notifications, and frequently asked questions. Any data entered by PMI staff will appear on the donor page in the blood donation application. The purpose of applying this technology or application is to simplify PMI operations and to increase the number of donors at the Sukajadi Branch.

Evaluation Of the Community Service Activities

Evaluation Scope and Instrument

The evaluation covered two groups, namely community users of the application N = 50 and PMI officers N = 6. A pre- and post-questionnaire was used to capture short-term changes after training, mentoring, and initial use of the application. Responses used a 5-point Likert scale where higher values indicate more positive evaluations. Items map to the modules practiced during training, including login, registration, home, donation schedule, registration details, events management, emergency blood requests, blood stock updates, notifications, voucher transactions, user data, and frequently asked questions. Reporting is descriptive only and uses percentages in three categories per item, namely unfavorable 1 to 2, neutral 3, and favorable 4 to 5, with values rounded to one decimal place.

Percentage Distribution by Item Before and After Technology Deployment

Item-level percentage distributions are presented for community users (N = 50) and PMI officers (N = 6) to enable direct pre- to post-comparison. Values appear as absolute percentages alongside the change from pre to post, highlighting practical shifts in adoption, usability, and workflow readiness. For the officer group, the small sample size produces stepwise percentages of about 16.7 after rounding to one decimal place. More detailed results are provided in Tables 1 through 4 below

TABLE 1. Percentage distribution by item (community users, N= 50)

Item	Pre Unfavorable %	Pre Neutral %	Pre Favorable %	Post Unfavorable %	Post Neutral %	Post Favorable %	Change in Favorable (pp)
Mobile app login	18.0	24.0	58.0	4.0	10.0	86.0	+28.0
Registration flow	18.0	26.0	56.0	4.0	12.0	84.0	+28.0
Home screen usability	20.0	28.0	52.0	6.0	14.0	80.0	+28.0
Donation schedule clarity	20.0	30.0	50.0	6.0	12.0	82.0	+32.0
Registration details clarity	22.0	30.0	48.0	6.0	14.0	80.0	+32.0
Events management	18.0	28.0	54.0	6.0	12.0	82.0	+28.0
Emergency blood request flow	24.0	30.0	46.0	4.0	10.0	86.0	+40.0
Blood stock update	20.0	32.0	48.0	6.0	12.0	82.0	+34.0

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Item	Pre Unfavorable %	Pre Neutral %	Pre Favorable %	Post Unfavorable %	Post Neutral %	Post Favorable %	Change in Favorable (pp)
workflow							
Usefulness of notifications	20.0	30.0	50.0	4.0	12.0	84.0	+34.0
Voucher transactions handling	20.0	28.0	52.0	6.0	16.0	78.0	+26.0
User data management	18.0	28.0	54.0	6.0	12.0	82.0	+28.0
FAQ and information	20.0	30.0	50.0	6.0	14.0	80.0	+30.0

Note: Unfavorable = 1-2; Neutral = 3; Favorable = 4-5; Change = Post Favorable minus Pre Favorable

TABLE 2. Averages across items (community users, N= 50)

Metric	Pre %	Post %	Change (pp)
Unfavorable average	19.8	5.3	−14.5
Neutral average	28.7	12.5	−16.2
Favorable average	51.5	82.2	+30.7

Favorable responses increased from 51.5 percent to 82.2 percent (+30.7 pp). Neutral responses decreased from 28.7 percent to 12.5 percent (-16.2 pp), and unfavorable from 19.8 percent to 5.3 percent (-14.5 pp). The largest item gains were emergency blood request flow (46.0 → 86.0 percent, +40.0 pp), notifications (50.0 → 84.0 percent, +34.0 pp), blood stock updates (48.0 → 82.0 percent, +34.0 pp), donation schedule clarity (50.0 → 82.0 percent, +32.0 pp), and registration details clarity (48.0 → 80.0 percent, +32.0 pp). These shifts indicate broader improvements in usability and workflow clarity for community users.

TABLE 3. Percentage distribution by item (PMI officers, N= 6)

Item	Pre Unfavorable %	Pre Neutral %	Pre Favorable %	Post Unfavorable %	Post Neutral %	Post Favorable %	Change in Favorable (pp)
Mobile app login	16.7	16.7	66.7	0.0	0.0	100.0	+33.3
Registration flow	0.0	33.3	66.7	0.0	0.0	100.0	+33.3
Home screen usability	16.7	33.3	50.0	0.0	16.7	83.3	+33.3
Donation schedule clarity	16.7	33.3	50.0	0.0	16.7	83.3	+33.3
Registration details clarity	16.7	33.3	50.0	0.0	16.7	83.3	+33.3
Events management	16.7	33.3	50.0	0.0	16.7	83.3	+33.3

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Item	Pre Unfavorable %	Pre Neutral %	Pre Favorable %	Post Unfavorable %	Post Neutral %	Post Favorable %	Change in Favorable (pp)
Emergency blood request flow	16.7	33.3	50.0	0.0	0.0	100.0	+50.0
Blood stock update workflow	16.7	33.3	50.0	0.0	16.7	83.3	+33.3
Usefulness of notifications	0.0	50.0	50.0	0.0	0.0	100.0	+50.0
Voucher transactions handling	16.7	33.3	50.0	0.0	16.7	83.3	+33.3
User data management	16.7	16.7	66.7	0.0	0.0	100.0	+33.3
FAQ and information	0.0	50.0	50.0	0.0	16.7	83.3	+33.3

Note: Unfavorable = 1-2; Neutral = 3; Favorable = 4-5; Change = Post Favorable minus Pre Favorable

TABLE 4. Averages across items (PMI officer, N= 6)

Metric	Pre %	Post %	Change (pp)
Unfavorable average	12.5	0.0	−12.5
Neutral average	33.3	9.7	−23.6
Favorable average	54.2	90.3	+36.1

Favorable responses rose from 54.2 percent to 90.3 percent (+36.1 pp). Neutral decreased from 33.3 percent to 9.7 percent (-23.6 pp) and unfavorable from 12.5 percent to 0.0 percent (-12.5 pp). The largest item gains were emergency blood request flow (50.0 → 100.0 percent, +50.0 pp) and notifications (50.0 → 100.0 percent, +50.0 pp), followed by consistent increases of +33.3 pp on core tasks such as login, registration, events management, registration details, and blood stock updates. These outcomes indicate strong consolidation of routine console use and readiness during emergency scenarios among officers.

CONCLUSION

This community service program shows that a structured P3P sequence that consists of training, mentoring, and staged deployment can move a paper-based donor service toward a working digital model at the branch level. The two-sided application linked public participation with officer operations and created a single source of digital records for registration, verification, scheduling, emergency requests, stock updates, and outreach. Descriptive evaluation indicates consistent improvements after deployment. Among community users (N = 50), favorable responses rose from 51.5 percent to 82.2 percent with the largest gain on the emergency blood request flow at +40.0 percentage points. Among PMI officers (N = 6), favorable responses increased from 54.2 percent to 90.3 percent with gains of +50.0 percentage points on

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emergency requests and notifications. These shifts align with the program objectives of auditable recordkeeping and faster, more reliable service response.

The program's practical contribution is an operational pathway that local branches can reuse: a compact training package, on-site mentoring during early use, minimal configuration for go-live, and routine monitoring through simple indicators that can be read directly from system logs. The approach is realistic for small teams because it reduces manual steps, standardizes critical actions, and concentrates effort on a few high-value features that matter for day-to-day services and emergency readiness.

Two limitations should be noted. First, the evaluation covers one branch with a short follow-up and relies on questionnaire percentages without inferential testing. Second, the officer sample is small, which produces stepwise percentage changes after rounding. Future work will extend monitoring with longer time horizons, incorporate objective analytics from the application logs, and test targeted improvements such as refined reminders, accessibility enhancements, and streamlined data correction. Replication across other PMI branches will help assess generalizability and support the development of a city-level or province-level playbook for digital donor services.

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