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Empowering a Disability Rehabilitation Foundation in Bali through Staff Training and a Web-Based Health Record System

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ABSTRACT : Rehabilitation services for children with special needs depend on accurate and continuous records of therapy and development, yet many non-profit foundations still keep these records in scattered spreadsheets. This community empowerment program aimed to strengthen digital record-keeping capacity at Yayasan Peduli Kemanusiaan (YPK) Bali, a disability rehabilitation foundation in Denpasar, by delivering a web-based rehabilitation health record system together with user training. A participatory five-stage approach was applied: needs analysis and coordination, system design and development, socialization and training, implementation with mentoring, and evaluation and handover. The main on-site activity took place on 3 June 2026 at the Annika Linden Centre. Knowledge was assessed with a pre-test and a post-test completed by five participants (administrative staff and therapists) and analyzed descriptively. The mean score rose from 65.24 to 87.12 (+21.88 points; +33.54%; normalized gain 0.63, medium category). The system, a printed user manual, a video, an electronic news article and a copyright-recorded poster were produced. Effects on work efficiency and long-term use were not measured, and the very small sample limits generalization. The program illustrates how a structured training component can accompany technology transfer in a non-profit rehabilitation setting and how the level of evidence can be reported transparently.

KEYWORDS: community empowerment, rehabilitation health record, children with special needs, web-based information system, capacity building.

I. INTRODUCTION

Research Background : Children with special needs often require long-term rehabilitation delivered by several professionals, and coordinating care across settings, professionals and families reduces fragmented care [1]. In practice, such coordination depends on records that can be shared and followed over time. In Indonesia, the rights of persons with disabilities to health and rehabilitation services are regulated by Law No. 8 of 2016 [2] , and the Minister of Health Regulation No. 24 of 2022 governs medical records, including their electronic form, in health service facilities [3] . Globally, the World Health Organization (WHO) documents persistent health inequities among persons with disabilities and outlines actions to advance health equity [4] , while its global strategy on digital health promotes person-centered digital solutions to strengthen health systems [5] . Health information technology, including electronic health records (EHR), has been associated predominantly with positive effects on the quality and efficiency of care [6] . A review of 55 studies on the use of EHR for population health found that productivity and efficiency gains were the most frequent facilitators, whereas missing data, lack of interoperability, loss of productivity and technological complexity were the main barriers [7] .

Implementation is therefore complex and depends on the interplay of context, content and implementation process [8] . Experience with electronic medical record (EMR) projects in developing countries identifies the lack of infrastructure and trained staff as important barriers [9], and a review of primary-care implementations in seven countries found that leadership, project management and staff training influence implementation outcomes [10].In Indonesia, a literature review of EMR implementation reports adoption by many health service institutions but persistent obstacles, including a shortage of qualified human resources and the need to improve digital literacy, training and understanding of EMR workflows [11] . The national self-assessment of hospital digital maturity likewise treats the skills of health workers in using information systems as one component of readiness [12] .Yayasan Peduli Kemanusiaan (YPK) Bali is a non-profit social foundation in Denpasar that has focused on the rehabilitation of physical disabilities and the empowerment of children with special needs since 2001. The fulfillment of rehabilitation rights for persons with disabilities at the foundation, including during the COVID-19 pandemic, has been examined from a human-rights perspective [13] .

Field observation and discussions with the partner before this program showed that rehabilitation health records and child development records were kept manually in Microsoft Excel spreadsheets. Client identities, therapy histories, developmental evaluations and administrative reports were stored in separate files, so searching for information was slow, monitoring a child's development required opening several files, and reports were compiled manually. The foundation also lacked a mechanism to differentiate access rights among administrators, therapists and families, and its staff needed stronger competence in digital systems.Delivering software does not by itself ensure that it is used. Technology acceptance and information systems success models emphasize perceived usefulness, ease of use, system quality and user satisfaction [14], [15], [16] , and a scoping review of EMR training found that participants' knowledge was the most frequently measured training outcome, whereas organizational and patient-level outcomes were rarely assessed [17]. A community program that hands over a record system should therefore treat training and evaluation as integral components and report transparently what level of evidence has been reached.

II. LITERATURE REVIEW

Empowerment is commonly conceptualized as a process through which individuals and organizations gain mastery over matters that affect them [18]. In community programs, this process is supported by participatory approaches in which partners help define problems and solutions rather than receive ready-made products [19]. Participatory design has been adapted to health informatics to involve users in system development, although it has mostly been applied to small-scale systems and needs extended frameworks for larger ones [20].In non-profit human service organizations, performance has been linked to human, financial and social capital [21], and a bibliometric review of digital transformation in non-profit organizations highlights people-centered factors and calls for conceptual models that reflect the specificities of the sector [22]. These findings suggest that capacity building for record systems concerns people and routines as much as software. Technology acceptance research identifies perceived usefulness and perceived ease of use as principal determinants of user acceptance [14], [15], while the information systems success model links system, information and service quality to use, user satisfaction and net benefits [16]. Training is a modifiable determinant. A scoping review of 46 studies identified five approaches to EMR training (one-on-one, peer-coach, classroom, computer-based and blended) and recommended that training objectives be specific and measurable so that outcomes can be evaluated rigorously [17] . In a pre–post study of 14 primary-care wellness staff, personalized EHR training was followed by improved knowledge of EHR advantages and shorter task times [23] . Kirkpatrick's four-level model (reaction, learning, behavior and results) remains a common framework for structuring such evaluations, although its assumptions have been critiqued [24] .

Community service programs in Indonesia have delivered EMR training through lectures, demonstrations, hands-on practice and discussion, and have reported positive responses from participants [25], [26]. Single-group pre–post designs describe change but differ in their capacity to support causal inference, and gain scores have reliability limits [27] ; reviews of digital interventions for people with disabilities likewise note that most studies were small-scale and relied on pre–post comparisons, questionnaires and interviews [28].Sustainability is a further concern: many digital health pilots do not become routine services, and their continuation depends on factors beyond the technology [29]. Role-based access control, which assigns permissions to roles rather than to individual users, is a long-established model for governing who may view and change records [30] , and the processing of personal data in Indonesia is regulated by Law No. 27 of 2022 [31]. To the authors' knowledge, reports that describe a small non-profit rehabilitation provider and combine the delivery of a record system with explicit evidence of learning, while distinguishing implementation evidence from impact evidence, remain limited. This article addresses that gap with a single-partner case.

Research Objective: This community empowerment program aimed to strengthen the digital record-keeping capacity of YPK Bali by (i) developing and handing over a web-based rehabilitation health record system, (ii) training administrators and therapists through demonstration and hands-on practice, and (iii) evaluating the change in participants' knowledge while documenting implementation evidence, outputs and sustainability considerations. The article also maps the evidence obtained against training-evaluation levels to show what the program can and cannot yet claim.

III. MATERIALS AND METHODS

Program Design and Setting : The program was a participatory community empowerment activity funded by the internal community service grant of the Directorate of Research and Community Service (DPPM), Universitas Warmadewa, under the Community-Based Empowerment scheme (Beginner Community Empowerment scope) of 2026. The partner was YPK Bali, located at the Annika Linden Centre (ALC), Jl. Bakung No. 19, Banjar Tohpati, Kesiman Kertalangu, East Denpasar, Bali. The main on-site activity,

Comprising socialization, training, practice and handover, took place on 3 June 2026 at the ALC. The team consisted of four lecturers (computer engineering, electrical engineering, development economics and software engineering) assisted by students.

Participants and Partner Involvement : YPK Bali involves administrators, therapists, educators, volunteers and families in the rehabilitation of children with special needs. Five staff members, comprising administrative staff and therapists who would use the system in their daily work, took part in the training, and the evaluation covered these five participants. The partner contributed by describing its record-keeping needs, joining the socialization and training, practicing on the system, giving feedback on usability and needed features, and committing to continue using the system with the user manual and to consult the team when technical problems arise.

Implementation Stages



Fig. 1. Five-stage participatory approach of the community empowerment program at YPK Bali.

The program followed five stages (Fig. 1). In stage 1, the team coordinated with the foundation through observation and discussion to identify problems and user needs, and prepared training materials, user accounts, devices and supporting equipment. Stage 2 comprised the design and development of the web-based system, with the partner involved from needs identification to implementation. In stage 3, the team introduced the purpose, benefits, usage flow and main features of the system (patient data management, therapy records, development monitoring and report generation) and trained participants by demonstration and hands-on practice. In stage 4, the team assisted participants on site so that they could resolve usage problems and use the main functions for operational needs. Stage 5 comprised the evaluation (pre-test and post-test, observation of practice and partner feedback) and the handover of the system together with the printed user manual *Panduan Penggunaan Sistem Rekam Medis Rehabilitasi 2026* (Rehabilitation Medical Record System User Guide 2026).

The Web-Based Record System : The system was developed with the CodeIgniter 4 framework and a MySQL database and is accessed through a web browser. According to the interfaces captured in the final report (Fig. 3), it provides registration, assessment, survey, scheduling, evaluation and visitation workflows; client data, daily medical records (condition, exercises and results), attendance, statistics and reports with PDF and Excel export; scheduling with WhatsApp notification; assessment forms for child and adult clients; and user management. Access follows a role-based model with three roles: administrator, therapist and family [30] . The handling of clients' personal data is subject to national data protection law [31] . The team has previously developed a web-based administrative information system at the same university [32] .

Evaluation and Data Analysis : Learning was evaluated with a pre-test administered before and a post-test administered after the training, complemented by observation of hands-on practice and feedback from the

partner. The tests measured participants' understanding of the use of the digital rehabilitation record system, and the results were summarized as mean scores. Assuming a maximum score of 100, the absolute gain ($\Delta S = S_{post} - S_{pre}$), the relative change (1) and Hake's normalized gain g (2) were calculated, with $g \geq 0.7$, $0.3 \leq g < 0.7$ and $g < 0.3$ classed as high, medium and low gain, respectively [33] . The relative change and the normalized gain were calculated as follows:

$$\text{Relative change (\%)} = (S_{post} - S_{pre}) / S_{pre} \times 100 \quad (1)$$

$$g = (S_{post} - S_{pre}) / (100 - S_{pre}) \quad (2)$$

Because the sample was very small (n = 5) and the design was a single-group pre–post comparison, no inferential test was applied and the findings are descriptive [27] . Evidence was classified as outputs (what was delivered) or, following Kirkpatrick-type levels (reaction, learning, behavior and results) [24], as evidence of learning, behavior or results, in order to distinguish implementation evidence from impact evidence.

Documentation and Data Handling: Program documentation comprised the final program report, photographs of the activities, screenshots of the system, the team's press text and the registered outputs. No client-level health data were analyzed or are reported in this article. The system screenshots display aggregate indicators only, and the photographs show adult staff and team members.

IV. RESULTS AND DISCUSSION

Baseline Conditions And Partner Needs : The needs analysis showed that the foundation's rehabilitation health records were managed manually in spreadsheets. Because client data, therapy histories and developmental evaluations were spread across many files, searching was slow, monitoring a child's progress required opening several files in turn, and the risk of recording errors, duplication and inconsistent information increased as the number of clients and sessions grew. Reports were compiled manually from several sources, access rights could not be differentiated among administrators, therapists and families, and coordination relied on manual communication. The partner expressed the same need at the handover. An administrator representing the foundation stated (translated from Indonesian): "We truly feel the need for a better system. With the manual system that is still in the form of Excel, data are scattered across many files, and it is rather difficult for us when we must monitor the development of each child" (as recorded in the team's press text). Table 1 maps each problem to the intervention component and to the evidence obtained.

Table 1. Partner problems, intervention components and evidence obtained

Problem identified	Intervention component	Evidence obtained (level)
Records kept in spreadsheets; data scattered across files	Web-based system with an integrated database	Output: system online and in operation (Fig. 3)
Child development monitoring not systematic; therapy history hard to trace	Medical record, assessment, evaluation and dashboard modules	Output: modules shown in Fig. 3; routine use not yet measured
Reports compiled manually	Report module with PDF/Excel export	Output: feature available; time saving not measured
No differentiated access rights	Role-based access for administrator, therapist and family	Output: three roles available; access control not tested in this program
Limited staff competence in digital systems	Socialization, training with practice, mentoring and user manual	Learning: pre–post gain (Table 2); output: manual handed over

Implementation and Partner Participation : On 3 June 2026 the team conducted the socialization, training and handover at the ALC (Fig. 2). The five participants practiced patient data management, the recording of medical and therapy records, development monitoring and the report features under guidance, and the team assisted them whenever difficulties arose. The team observed that participants took part actively and enthusiastically and reported that the main functions could be operated according to operational needs; however, no structured practice scores are reported, so these observations are treated as qualitative evidence only. At the handover, a representative of the foundation received the printed user manual (Fig. 2c).This participatory sequence is consistent with the view that partners should shape the solution rather than receive a finished product [19], [20] , and the combination of demonstration, hands-on practice and discussion resembles the

practice-oriented formats described in EMR training reviews and in comparable Indonesian *community* programs [17], [25], [26] . The implementation of a record system is, however, more than a software handover: it also requires attention to context, content and the implementation process [8] . The mentoring stage and the printed manual address the last of these by giving participants support after the session.



Fig. 2. Documentation of the activity at the Annika Linden Centre on 3 June 2026: (a) socialization and training session, (b) participants following the presentation, (c) symbolic handover of the printed user manual, and (d) team members and partner staff with the activity banner.

The Delivered System: The delivered system is accessible online through a web browser [34]. Its login page (Fig. 3a) lists the main functions: daily medical records of condition, exercises and results; automatic scheduling with WhatsApp notification; assessment of child and adult clients; reports with PDF and Excel export; and multi-role access for administrators, therapists and families. The administrator dashboard (Fig. 3b) summarizes active clients, sessions of the day, monthly attendance and the total number of clients, shows the status of the service flow (waiting for assessment, under assessment, accepted and not accepted), and presents visit trends and diagnosis distribution. The dashboard capture of 14 August 2026 displayed five registered clients, of which four were active, a flat visit-trend line and 0% attendance for the month. This indicates that the live system was at an early stage of use; the final report does not document whether the previous spreadsheet records have been migrated into it. These features correspond to the problems identified (Table 1). The role-based model separates what administrators, therapists and families may do, which matters because rehabilitation records contain personal and health information [30], [31] . Whether the features translate into faster searching, more consistent records or better coordination is an empirical question for the next phase, because the program did not measure these outcomes.

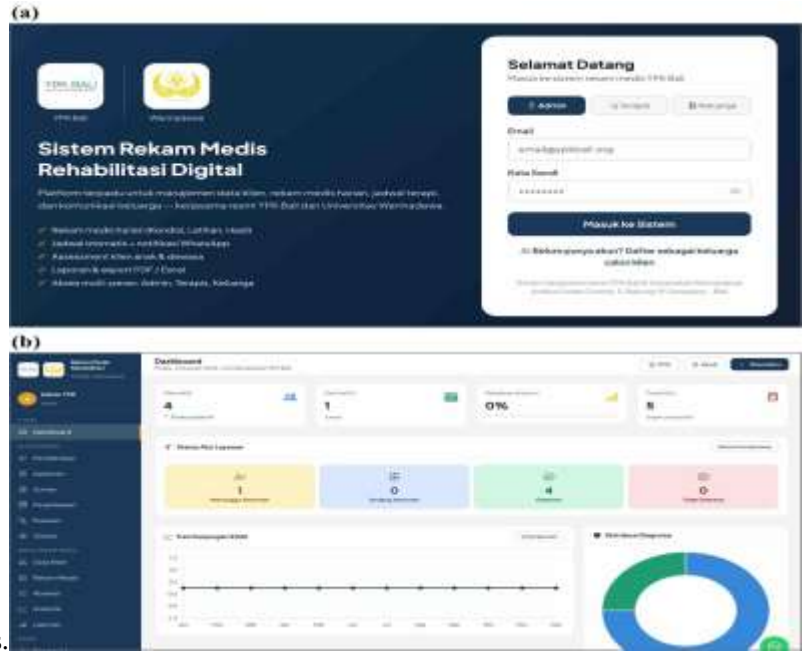


Fig. 3. Interfaces of the delivered system captured in the final report: (a) login page with the list of main functions and role selection, and (b) administrator dashboard of 14 August 2026.

Change in Participants' Knowledge : The pre-test and post-test results of the five participants are summarized in Table 2. The mean score increased from 65.24 to 87.12, an absolute gain of 21.88 points and a relative increase of 33.54%. The normalized gain was 0.63, which falls in the medium category ($0.3 \leq g < 0.7$) [33] ; that is, participants closed about 63% of the distance between their initial mean score and the maximum possible score.

Table 2. Pre-test and post-test results of the training participants (n = 5)

Indicator	**Value**
Mean pre-test score	65.24
Mean post-test score	87.12
Absolute gain (points)	21.88
Relative change, (1) (%)	33.54
Normalized gain *g*, (2)	0.63
Category (Hake)	Medium

Note: descriptive statistics only; a maximum score of 100 is assumed.

The direction and size of the change are consistent with the learning gains reported after EHR training in another primary-care setting [23] and with the positive participant responses reported in comparable community service programs [25], [26] The result is encouraging because the participants were the staff who would operate the system, so the knowledge gain is relevant to the capacity-building aim of the program. At the same time, the evidence is limited: (i) the sample is very small and restricted to the staff who would use the system; (ii) there is no comparison group, so the improvement cannot be attributed to the training alone; (iii) no follow-up measurement is reported, so retention is unknown; (iv) the validity and reliability of the instrument are not reported; and (v) gain scores are less reliable than the scores from which they are derived [27] . The result is therefore interpreted as a short-term learning gain (level 2 of the Kirkpatrick framework) and not as evidence of changed work behavior or organizational results [17], [24] .

Program Indicators and Level of Evidence : The program set six indicators for its outputs and outcomes, and Table 3 compares them with the evidence available. The indicators at the output level (features running, an online integrated database, a user manual and dissemination products) are supported by documents, screenshots and links. The indicator that at least 80% of users should be able to operate the system independently cannot be verified, because the reported post-test summarizes the mean score of five participants, and per-participant results or a practical competence checklist are not reported. Likewise, no measurement of recording time was made, so the target of a reduction of at least 50% is unevaluated. This distinction between implementation evidence and impact evidence is important: the program shows that a record system was delivered and that participants' knowledge increased, but it has not yet shown improved efficiency or service quality.

Table 3. Program indicators and the evidence available

Indicator	**Evidence available**	**Status**
At least five main system features running	Login page lists daily records, scheduling with WhatsApp notification, child and adult assessment, PDF/Excel reports and multi-role access (Fig. 3a)	Met
Integrated database accessible online	System in operation at a public web address; dashboard capture of 14 August 2026 (Fig. 3b)	Met
At least 80% of users able to operate the system independently	Mean post-test score 87.12 (n = 5); per-participant results and practice checklist not reported	Not verifiable
Recording time reduced by at least 50%	No time measurement was made	Not measured
User manual (SOP) available	Printed manual handed over on 3 June 2026 (Fig. 2c)	Met
Media, video, poster, journal article and copyright outputs	Video, electronic news article (advertorial), recorded poster; this article	Met; journal article in preparation

Outputs and Dissemination : Documented outputs include the operating system [34], the printed user manual, a video on the DPPM Universitas Warmadewa YouTube channel [35], an electronic news article on kanalbali.id

dated 19 June 2026 [36], a poster whose copyright was recorded with the Ministry of Law of the Republic of Indonesia (application dated 19 June 2026), and this article. The news article is labeled as an advertorial and is therefore treated as dissemination of the activity and not as independent coverage.

Sustainability and Implications : The final report outlines a sustainability plan consisting of post-implementation mentoring, periodic monitoring and evaluation, incremental feature development, refresher training when features change or staff are replaced, and attention to the replication potential of the model in similar social service organizations. These elements are consistent with evidence that capacity, rather than technology alone, determines whether digital interventions continue after the pilot phase [21], [22], [29] . For YPK Bali, three conditions seem critical: a designated local administrator and disciplined routine data entry; regular maintenance, backup and hosting arrangements; and governance of clients' personal data in line with Law No. 27 of 2022 [31]. For practice, the program suggests a replicable pattern for similar foundations: (i) begin with a documented baseline of the record-keeping problem; (ii) involve staff in defining requirements; (iii) combine the handover with hands-on training, a user manual and mentoring; (iv) measure learning immediately; and (v) pre-specify behavior and results indicators, such as the time needed to retrieve a client's history, the completeness of records, the time needed to prepare monthly reports and system usage logs, to be measured after a defined period of routine use. Such measures would move the evidence from the learning level toward behavior and results [17], [24] . Replication in other organizations should be preceded by a needs analysis because processes and information needs differ between organizations.

Limitations: This study has several limitations. It reports a single partner and a very small sample without a control group; the test instrument is described only briefly (items, scoring and timing are not detailed) and its scale is assumed to have a maximum score of 100; the evidence on practice and on the partner's response is qualitative and was gathered by the team itself; the news article is an advertorial; and the use of the system in routine service, the migration of earlier records and the effects on efficiency were not measured. Future work should add a follow-up measurement, usage logs, time-and-motion sampling and a structured satisfaction instrument and should compare outcomes across several organizations.

V. CONCLUSION

This community empowerment program delivered a web-based rehabilitation health record system to YPK Bali together with training, mentoring and a printed user manual through a participatory five-stage approach. Among five trained staff members, the mean knowledge score rose from 65.24 to 87.12 (normalized gain 0.63), indicating a medium short-term learning gain. The documented outputs are an operating system, a user manual, a video, an electronic news article, a recorded poster and this article. The program has not yet measured work efficiency, service quality or sustained use, and its small, uncontrolled evaluation limits generalization. A follow-up phase that measures behavior and results after a period of routine use, and that supports the migration of earlier records and local ownership of the system, is the logical next step. For similar foundations, the program offers a practical pattern that couples technology transfer with a measurable training component and an explicit statement of the level of evidence.

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