

Development of Web-Based Rtikabdimas Application With a Rapid Unified Process Approach

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ABSTRACT

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RTIKAbdimas is one of the annual routine ICT Volunteer programs in Indonesia. ICT volunteers use the website for information delivery, communication, and registration. Previous research has uncovered implementing and developing web platforms that support similar or benefit such programs, including information services, communications, registration, and online monitoring. Existing research still needs to provide a complete solution to the problem of printed files and manual methods in the RTIKAbdimas business process. This study aims to develop a web-based RTIKAbdimas application using the Rapid Unified Process approach by adopting and complementing existing research results for different problems. This research has succeeded in meeting the system specifications of the RTIKAbdimas business process and includes several online services on web applications developed by previous research. All actors have a dashboard to enter data and access information on data processing results. The most crucial benefit of this research is the control and time efficiency of the activities of actors other than program managers.

Keywords: *information and communication technology, online services, RTIKAbdimas, volunteers, web-based*

1. INTRODUCTION

Volunteers are individuals or groups of people, from amateurs to professionals, young or old, committed to providing their time and abilities to help the public interest for charity [1], [2]. Volunteers are essential in promoting Information and Communication Technology (ICT) in developing countries [3], for example, acting as actors who open access to public information [4], build citizen journalism [5], monitor hoax information [6], providing awareness about the dangers of hate speech and bullying [7]–[10].

ICT volunteers in Indonesia play a role in helping the government [11], such as being a facilitator in implementing village websites [3]. The village government involves the community as ICT volunteers as a solution to the limited number of village officials who master ICT [12]. ICT volunteers act as community information groups that manage information and create citizen journalism that shares information through village websites [5]. In addition, ICT volunteers train and implement village websites that provide access to services and information on village potential in a bold manner [13]. In the micro, small, and medium business sectors, ICT volunteers provide online marketing training and assistance in making product profile videos [14]–[16]. Besides that, ICT volunteers also strengthen digital literacy competence in the education sector, so students can use ICT creatively without ignoring digital ethics [17]. They also carry out training and mentoring programs to improve the ability of teachers and students to utilize educational technology for all subjects [18] or specific subjects [19]. Even though ICT volunteers educate people online during the Covid-19 pandemic, beneficiary partners are very loyal and enthusiastic about their services [19]–[21].

The critical role of ICT volunteers is maintained by recruitment. Institut Teknologi Garut mobilizes students to become ICT volunteers through ICT volunteer classes. This class is the first community service learning activity before carrying out actual work lectures [22]. Students who take part in the classes receive training in the form of volunteer theory within half a semester, then practice it in the RTIKAbdimas program throughout the following half semester. This practice includes digital literacy activities targeting residents and reporting the results of activities in scientific

forums and publications. The RTIKAbdimas label is based on the program hashtag on social media, which means ICT volunteers as community servants. The RTIKAbdimas program has had quite a good impact. For example, in 2021, this program increased public knowledge by 17.26 points based on the difference between the post-test and pre-test results [23]. 87% of participants were satisfied with this program [24]. Thus, the wheel of digital literacy development continues to spin thanks to the RTIKAbdimas program, which runs annually.

It is just that the application of ICT in managing the RTIKAbdimas program is still not integrated, where data collection uses Google Forms and data processing uses Microsoft Office. The condition causes data or files to be scattered in many places, thus confusing users who do not understand the relationship between the data or files. Previous studies have developed web applications for volunteer performance recording and reporting services [25]. Other research reveals that ICT volunteer organizations have implemented web platforms, such as websites for information delivery, communication, and registration [26]. The results of other studies that developed systems for control services, including announcements, supervisor assignments, and monitoring task progress, can be considered for developing this application [27]. The existing result only partially solves the RTIKAbdimas program problem. There is an opportunity for researchers to combine these solutions and adapt and complement them to solve integration problems. Based on this opportunity, this study aims to create a web application for the RTIKAbdimas program that automates the tasks of program managers.

2. METHODS

The development of online services for RTIKAbdimas uses the Rapid Unified Process (RUP) approach. Figure 1 shows the stages and activities to achieve the research objectives. This web application was developed while the RTIKAbdimas program was running. The RUP and its tools allow users to get the system up and running quickly, and developers can fix it immediately after receiving user feedback.

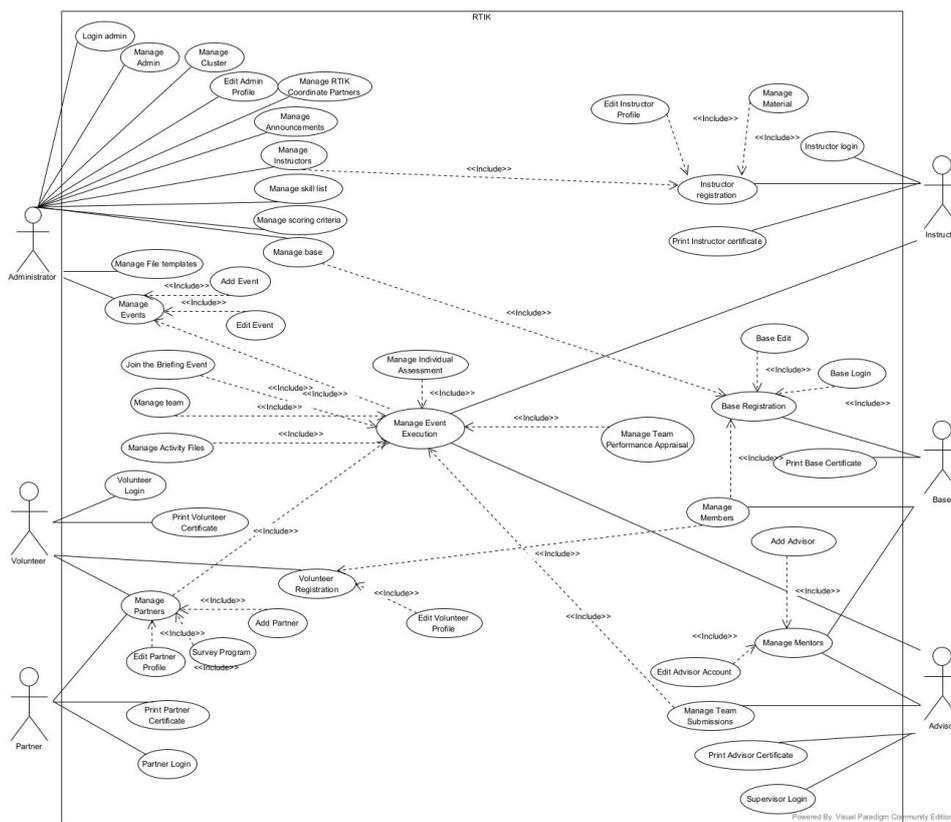


Figure 2. Use case diagram

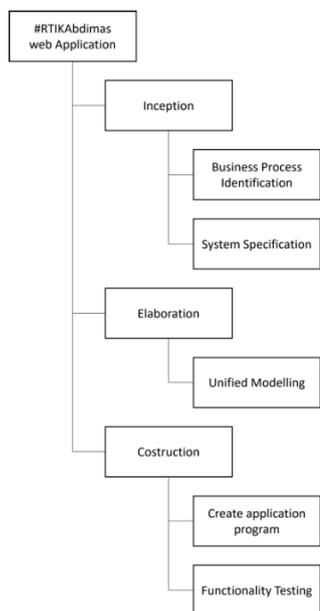


Figure 1. Work Breakdown Structure

At the inception stage, the program manager explains the RTIKAbdimas business process and determines system specifications that include tasks in the business process turning automatic. By paying attention to these inputs, the researcher used case diagrams, activity

diagrams, class diagrams, menu structures, and interfaces. Next, the researcher made a prototype by referring to the model diagram. In the end, the researcher checks the suitability of the system's function or reaction to the input with the requirements specification using the black-box testing method [28].

3. RESULTS AND DISCUSSION

The RTIKAbdimas program manager explains system specifications based on business processes, including the registration, debriefing, service, reporting, and assessment phases [23]. In the registration phase, the system presents information on the RTIKAbdimas event and related template files, opens registration services for volunteers and instructors, and informs registrants and associated files to the RTIK base. Participants propose groups of volunteers and mentors and participate in debriefing activities using specific media in the debriefing phase. The system presents service-related template files, and participants submit partners in the service phase. Participants publish news articles about their activities and upload group reports in the

reporting phase. In the assessment phase, participants assess colleagues, partners assess volunteer groups, supervisors assess volunteer reports, and the system presents the assessment results in participant certificates. Ultimately, the system gives certificates to the volunteer base, mentors, participants, and partners. Figure 2 shows the relationship between the actors in their respective roles.

Table 1 shows the role of actors in RTIKAbdimas. The administrator provides initial data in the form of data from other users who also act as administrators, at least including usernames and passwords. Administrator profile can be equipped with a photo and contact list. Administrators help ICT volunteer administrators deliver announcements, so this system is equipped with related functions.

Table 1. Actors and Roles

No	Actors	Roles
1	Admin	Create, manage, and organize RTIK Abdimas events.
2	Base	Organize the RTIKAbdimas event at the local level and print a volunteer base certificate.
3	Instructure	Become a presenter in briefing events, manage briefing materials, and print instructor certificates after finishing providing debriefing.
4	Mentor	Become a counselor for a volunteer group, assess the performance of a volunteer group, and print a mentor certificate after conducting an assessment.
5	Volunteer	Register as a volunteer, propose volunteer groups and mentors, participate in debriefing events, propose partners, report on volunteer activities, assess colleagues, and print certificates of attendance.
6	Partner	Fill out program surveys, and print partnership certificates.

ICT volunteer activities are centered on the base or RTIK base, so administrators need to add an RTIK base profile. A volunteer TIK coordinator leads each RTIK base, so administrators must add partner coordinator data with their profile data. The coordinator can

access the system, so his username and password must be saved.

The most important activity in the RTIK base is the debriefing of the ICT volunteer team, so the administrator must add the trainer's data and list of skills. The trainers can train volunteer ICT personnel from the regular RTIK base. Every ICT volunteer personnel can participate in training organized by ICT volunteer administrators. Every online activity of the training process is carried out by actors involved through the system. The process is called RTIKAbdimas event added by the administrator.

The RTIKAbdimas event includes the service activities of the ICT volunteer team to beneficiary partners (called partners). Anyone can register as an ICT volunteer and complete their profile through this system. Each TIK volunteer personnel must have an RTIK base, so the RTIK coordinator adds applicants he knows to his list of base members. The ICT volunteer team carries out services under the guidance of senior ICT volunteers as advisors or mentors. RTIK coordinates adding several colleagues as advisors to the ICT volunteer team. Afterward, each advisor can run the RTIKAbdimas event with several instructors. Advisors can accept and reject RTIKAbdimas registrants or participants as personal team members that they are mentoring.

Furthermore, advisors and trainers become speakers at briefing events and manage all file activities required by the ICT volunteer team. The trainer delivers training material based on the material he manages in the system. The most important task of both is to provide individual and group assessments, which are the input for scoring the performance of ICT volunteers. Another input comes from partners who review the quality of ICT volunteer services. ICT volunteers will find the score in the certificate they receive after the entire RTIKAbdimas process is complete. Institutions that form the basis of RTIK, instructors, advisers, and partners also receive certificates related to these activities.

Making a web-based RTIKAbdimas application pays attention to use cases and other diagrams. Figure 3 shows the interface for administrators who support the RTIKAbdimas program event management. Through this interface, administrators can deliver statistics that include the development of volunteer participation, comparison of types of services and partner groups, and the ratio of debriefing participation.

dashboards are limited to volunteer data only. The Instructor dashboard, as shown in Figure 4, includes information on the schedule for the debriefing task and a feature for uploading debriefing materials. The certificate button appears automatically after the debriefing task is complete. Mentor provides services related to the RTIKAbdimas event that will and has taken place. The dashboard for the mentor, as shown in Figure 5, includes a feature to approve or

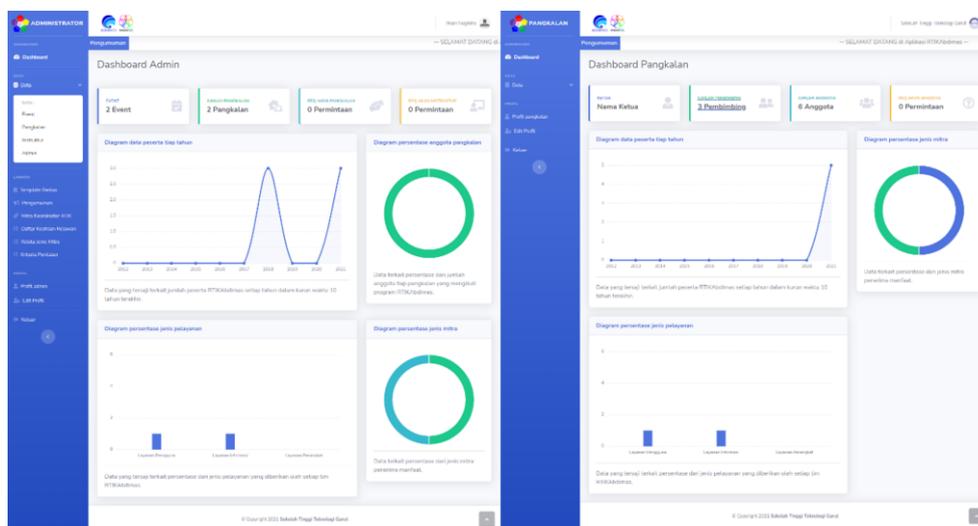


Figure 3. Dashboard for Administrator and RTIK Bases

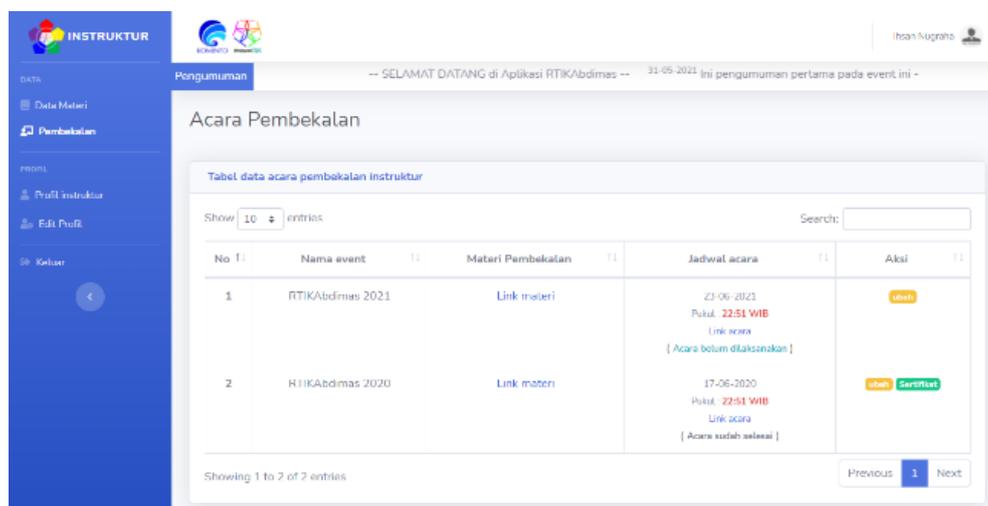


Figure 4. Dashboard for Instrukture

RTIK bases need services that support the supervision of the RTIKAbdimas program at the local level. The web application of RTIKAbdimas contains the RTIK bases dashboard that provides information on the list of volunteers and mentors. The statistics in this

reject the volunteer group's request for guidance through the event menu. The supervisor can download the certificate on the completed event menu. The dashboard for volunteers, as shown in Figure 6, includes a shape similar to a dashboard for instructors, and the location for

downloading certificates is on the same menu. The activity icon will be active according to the time conditions previously determined by the administrator.

Figure 7 shows the dashboard for partners. The most important part of the online service

assessment of ICT competencies and devices. Good competence of ICT volunteers and useful ICT devices can increase partners' motivation to work together in the future.

Supervision is part of the judgment, the final phase of the RTIKAbdimas program. The

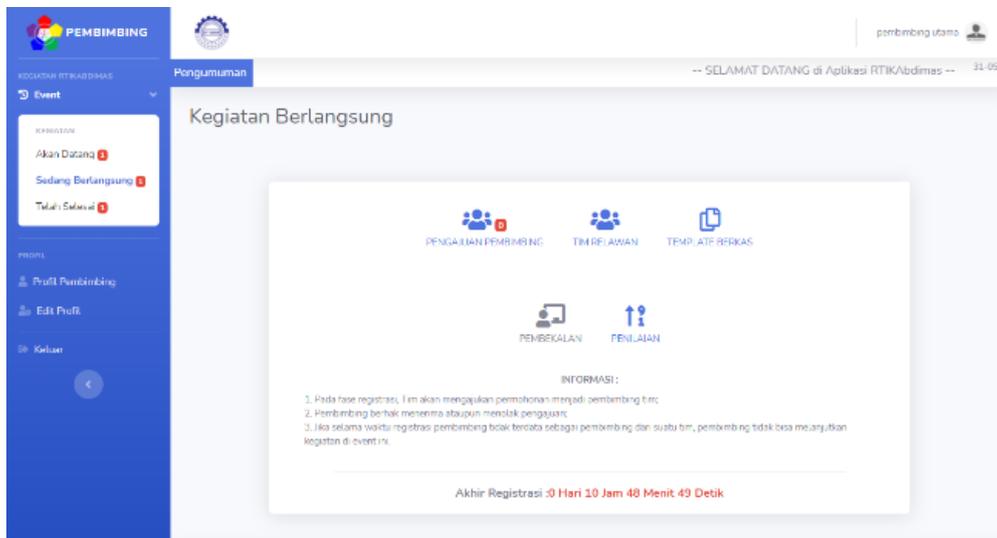


Figure 5. Dashboard for Mentor

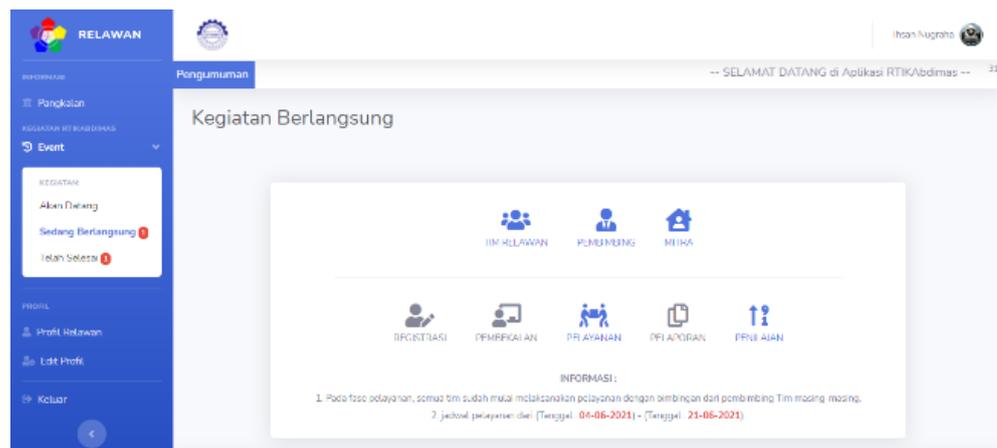


Figure 6. Dashboard for Volunteer

for partners is filling out program surveys in a form with closed-ended questions. The survey questions covered the ability of ICT volunteers to meet partners' needs, the benefits of ICT devices introduced by ICT volunteers, motivation to apply the competencies provided by ICT volunteers and work together again in the future both individually and as an organization, as well as satisfying aspects. The survey results are helpful input for planning the next RTIKAbdimas program. The survey is an

results of the partner's assessment are one of the variables on ICT volunteer performance scores. Another variable is the assessment of the advisor and peer assessment. ICT volunteer performance scores will be included in the certificate. ICT volunteers download the certificate from their dashboards. At the same time, advisors and the RTIK base will receive a certificate of participation without a score. Until this development stage, there is no need to evaluate the performance of bases and advisors.

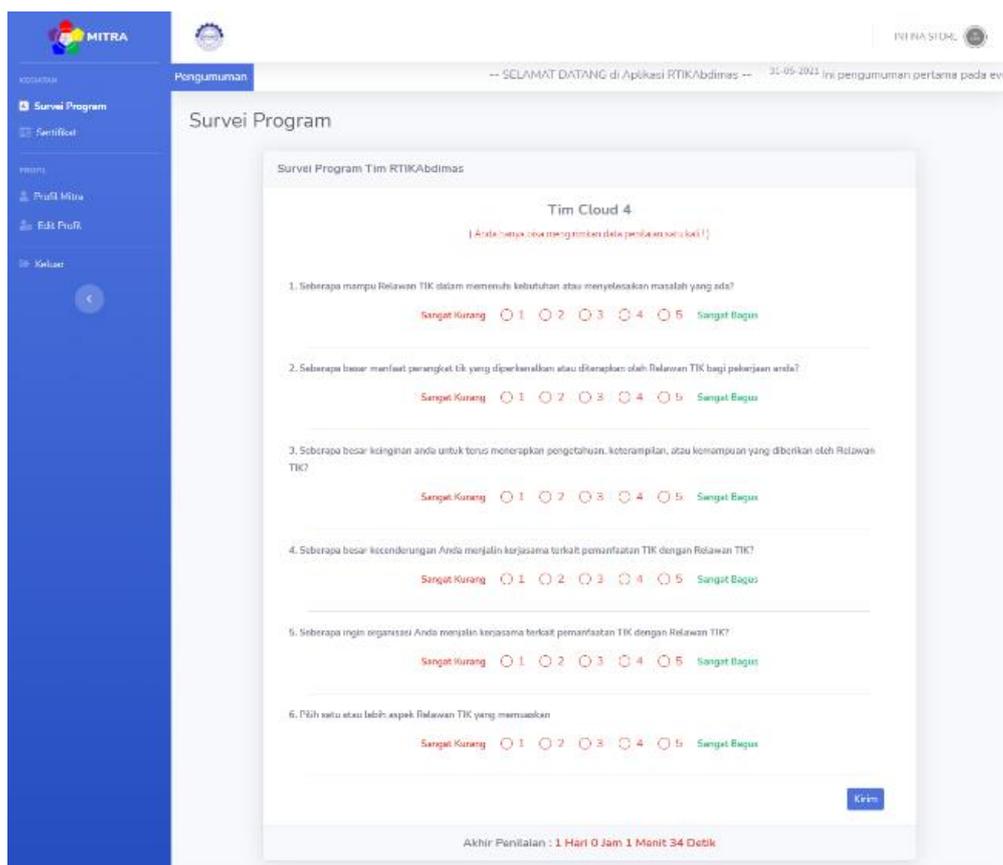


Figure 7. Dashboard for Partners

All critical scenarios in table 2 follow business process requirements or system specifications.

Table 2. Test Result

No.	Scene	Result
A ADMINISTRATOR		
1	Choose the type of actor as Administrator, fill in the correct username/email and password, then press the login button.	Login successfully, and enter the Dashboard Admin page.
2	Access the event page, press the add event button, fill in the event name correctly and press the save button.	Successfully added new event and showed notification.
3	Access the event page, press the event details button, and set the event data correctly.	Successfully save event data and display notification.

Table 2 continued...

No.	Scene	Result
4	Access the file template manage page, press the edit button, change the file data and press the save button.	Successfully changed file template data and displayed notification.
5	Accessing the rating indicators page, changing the rating percentage, or rating indicators correctly.	Successfully changed the percentage or scoring indicator.
6	Access the announcement page, press the add announcement button, fill out the form correctly and save it.	Successfully added new announcement and showing notification.

Table 2 continued...

No.	Scene	Result
B MENTOR		
1	Access submission approve/reject submission.	team page, team Successfully approve/reject the submission.
2	Access the grades correctly grades mentoring team.	manage page and assign to each team Successfully sent value and display notification.
C VOLUNTEER		
1	Pressing the event there is in the registration phase.	the follow button when there is an event that is in the registration phase. Volunteers register for upcoming events.
2	On the event implementation menu correctly.	the event page, Volunteers use the menu provided correctly. Volunteers register for upcoming events.
D PARTNER		
1	Access the survey assessment and the submit button.	the program page, give an assessment and press the submit button. Successfully submitted an assessment and cannot re-evaluate

CONCLUSION

The RTIKAbdimas application supports good time management, where all actors other than administrators must input data within a predetermined time frame by the program manager. This web application also makes it easier for program managers to calculate performance scores. The system automatically calculates them based on several actors' recorded performance scores. The system generates certificates, reducing the lag time in sending certificates to related actors.

In the end, this research succeeded in developing a web application that supports the RTIKAbdimas program, which records and reports on the performance of volunteers as in previous research [25]. Volunteer performance records include peer, mentor, and partner assessments. This application does not provide access to information on volunteer performance for stakeholders.

The RTIKAbdimas application provides features for publishing announcements, determining supervisors, and monitoring the progress of activities, as well as control functions in other studies [27]. Administrators as program managers can publish event announcements through their dashboards. Only supervisors and volunteers know the progress of activities through the current event menu.

The development has not touched upon the need for online communication between actors, so in its implementation, it still needs to be supported by a platform for communication. With all its limitations, this web application has created an online service for all actors involved in the RTIKAbdimas program. It is more than a service on a website that only includes information delivery, communication, and registration [19].

Future research can focus on development to meet the needs of stakeholders related to sponsorship decisions. Program managers and volunteer bases must monitor the progress of all stages passed by other actors. Researchers need to add a communication function that supports mentors to guide volunteers in making a volunteer report. The function is also helpful for coordination between actors and other benefits that support tasks in the RTIKAbdimas business process.

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REFERENCE

- [1] R. Cahyana, "Memfungsikan Telecenter Sebagai Pusat Pembangunan Ekonomi Digital di Wilayah Perdesaan dengan Melibatkan Relawan Teknologi Informasi," *Temu Ilmiah Nasional Peneliti*, 2016.
- [2] R. Cahyana, "Integrasi Relawan Teknologi Informasi dan Komunikasi dalam Sistem Pendidikan Tinggi," *JAS-PT (Jurnal Analisis Sistem Pendidikan Tinggi Indonesia)*, vol. 2, no. 2, pp. 61–70, 2018.

- [3] K. Mahmood, M. A. Khan, and N. Siddique, "Volunteer endeavors to promote ICT in a developing country: The case of the Pakistan Library Automation Group," *Information Development*, vol. 24, no. 2, pp. 135–142, 2008.
- [4] E. Destriapani, S. Sarwoprasodjo, and D. Sadono, "Pemanfaatan Website Desa untuk Pembangunan: Perspektif Actor-Network Theory," *Sodality: Jurnal Sosiologi Pedesaan*, vol. 9, no. 3, 2021.
- [5] D. Ardianti, I. Satibi, R. Sonjaya, and I. Gunawan, "STRATEGI KOMUNIKASI PEMERINTAH KABUPATEN BANDUNG BARAT DALAM MENGIMPLEMENTASIKAN PROGRAM KELOMPOK INFORMASI MASYARAKAT (KIM) DI KABUPATEN BANDUNG BARAT (Studi Kasus pada Dinas Komunikasi Informatika dan Statistik (Diskominfo) Kabupaten Bandung Barat)," *POLISTAT*, vol. 3, no. 1, pp. 62–73, 2022.
- [6] F. L. Mufid and T. R. Hariandja, "Efektivitas Pasal 28 Ayat (1) UU ITE tentang Penyebaran Berita Bohong (Hoax)," *Jurnal Rechtsens*, vol. 8, no. 2, pp. 179–198, 2019.
- [7] J. Ulumudin, R. Alinuridin, R. M. Shidiq, and S. Yanuar, "Sosialisasi dan Analisis Bahaya Hate Speech di Lembaga Kursus & Pelatihan AL-AMIN Tentang," *Jurnal Pengabdian Literasi Digital Indonesia*, vol. 1, no. 1, pp. 28–33, 2022.
- [8] D. Aprila, R. Mutaqien, M. R. N. Hadi, F. R. Alamsyah, and A. I. Zulkarnaen, "Peningkatan dan Pelatihan Literasi Media Digital Anti Hoax, Bullying, dan Ujaran Kebencian di Rumah Tahfidz Quran Abulyatama," *Jurnal Pengabdian Literasi Digital Indonesia*, vol. 1, no. 1, pp. 1–7, Jun. 2022, doi: 10.57119/abdimas.v1i1.1.
- [9] A. B. Kalimat, A. N. Rahayu, M. Maulidiyana, M. Nurhayati, U. Masripah, and Y. A. Rahayu, "Literasi Digital Cyber Hating dan Pelatihan Pembuatan Laporan di Yayasan Al-Farisi," *abdimas*, vol. 1, no. 1, pp. 16–22, Jun. 2022, doi: 10.57119/abdimas.v1i1.3.
- [10] N. Irpan *et al.*, "Sosialisasi Cyber Hating Pada Pemuda Ichwan di Kampung Cireungit, Samarang Garut," *abdimas*, vol. 1, no. 1, pp. 23–27, Jun. 2022, doi: 10.57119/abdimas.v1i1.4.
- [11] D. Kurnia, "Analisis kritis terhadap Gerakan Nasional Literasi Digital dalam perspektif good governance," *Academia Praja: Jurnal Ilmu Politik, Pemerintahan, dan Administrasi Publik*, vol. 4, no. 1, pp. 107–133, 2021.
- [12] D. F. Anggraeni, "Partisipasi masyarakat dalam program sidekem (sistem informasi desa kawasan pemalang) di kabupaten pemalang (relawan tik dan sistem informasi desa kawasan pemalang)," *Journal of Chemical Information and Modeling*, vol. 53, no. 9, pp. 1689–1699, 2019.
- [13] A. Fajaryanto and M. B. Setyawan, "PELATIHAN DAN IMPLEMENTASI SISTEM INFORMASI WEBSITE DESA ILO-ILO," *Community: Jurnal Pengabdian Pada Masyarakat*, vol. 2, no. 2, pp. 44–51, 2022.
- [14] S. A. B. Sibarani, A. Munthe, and S. Irviantina, "Pemanfaatan Teknologi Informasi Guna Meningkatkan Pemasaran Produk Masyarakat di Kampung Nelayan Sebrang Medan Belawan," *Kumawula: Jurnal Pengabdian Kepada Masyarakat*, vol. 5, no. 2, pp. 309–315, 2022.
- [15] A. A. Hendriadi, B. N. Sari, and T. N. Padilah, "Pelatihan Digital Marketing Usaha Mikro, Kecil dan Menengah (UMKM) di Kabupaten Karawang," *Jurnal Pengabdian Masyarakat J-DINAMIKA*, vol. 4, no. 2, pp. 120–125, 2019.
- [16] M. Z. Rohman and W. E. Sari, "Peningkatan Branding Produk Untuk Promosi Usaha Mikro Kecil Menengah (UMKM)," *Dinamisia: Jurnal Pengabdian Kepada Masyarakat*, vol. 5, no. 6, pp. 1493–1499, 2021.
- [17] A. Dinia and M. M. K. Sari, "PENGUATAN KEMAMPUAN LITERASI DIGITAL OLEH RELAWAN TEKNOLOGI INFORMASI DAN KOMUNIKASI (TIK)," *Journal of Civics and Moral Studies*, vol. 5, no. 1, pp. 1–15, 2020.
- [18] L. Fitriani *et al.*, "Pelatihan dan Pendampingan Pembelajaran Daring Kepada Masyarakat Desa Cibunar di Era COVID-19," *Jurnal PkM MIFTEK*, vol. 2, no. 1, pp. 1–7, 2021.
- [19] N. L. N. S. P. Astawa, K. Q. Fredlina, and N. L. Suminiasih, "Sosialisasi dan

- Pelatihan Model Pembelajaran Bahasa Inggris Berbasis Proyek dalam Kondisi Pembelajaran Jarak Jauh,” *SELAPARANG Jurnal Pengabdian Masyarakat Berkemajuan*, vol. 4, no. 1, pp. 402–405, 2020.
- [20] K. T. Werthi, K. Q. Fredlina, P. N. A. Putra, and N. K. M. Astuti, “TINGKAT LOYALITAS KONSUMEN PADA KEGIATAN WEBINAR ONLINE RELAWAN TIK PROVINSI BALI DI MASA PANDEMI COVID 19,” *Jurnal Ilmu Manajemen Saburai (JIMS)*, vol. 7, no. 2, pp. 91–100, 2021.
- [21] K. T. Werthi, P. N. A. Putra, and K. M. Astuti, “Digital Ekonomi Bisnis Untuk UMKM Denpasar Pada Masa Resesi Ekonomi,” *Jurnal Abdi Masyarakat Saburai (JAMS)*, vol. 2, no. 01, pp. 35–41, 2021.
- [22] L. Fitriani, R. Hidayat, A. C. SN, and G. S. Ditama, “Kuliah Kerja Nyata Untuk Meningkatkan Pengetahuan Media Sosial di Desa Sukaratu,” *Jurnal PkM MIFTEK*, vol. 1, no. 2, pp. 151–157, 2020.
- [23] R. Cahyana, R. Setiawan, H. Aulawi, and B. T. Santoso, “PEMBANGUNAN KOMPETENSI LITERASI DIGITAL SEKTOR PENDIDIKAN DI MASA PANDEMI COVID-19 MELALUI# RTIKABDIMAS,” *JMM (Jurnal Masyarakat Mandiri)*, vol. 5, no. 4, pp. 1606–1617, 2021.
- [24] R. Cahyana *et al.*, “PENYADARAN BAHAYA UJARAN KEBENCIAN MELALUI# RTIKABDIMAS PROGRAM RELAWAN TEKNOLOGI INFORMASI DAN KOMUNIKASI ABDI MASYARAKAT,” *JMM (Jurnal Masyarakat Mandiri)*, vol. 6, no. 5, 2022.
- [25] R. Alisandi and R. Cahyana, “Pengembangan Sistem Informasi Untuk Perekaman dan Pelaporan Kinerja Kelompok Penggerak Masyarakat Informasi,” *Jurnal Algoritma*, 2016, doi: 10.33364/algoritma/v.12-2.245.
- [26] V. V. Murray and Y. D. Harrison, *The Impact of Information and communications technology on volunteer management*. Canadian Centre for Philanthropy, 2002.
- [27] R. Setiawan and L. H. A. Aslina, “Pengembangan Aplikasi Controlling Tugas Akhir Berbasis Web Sisi Koordinator, Dan Pemangku Keputusan,” *Jurnal Algoritma*, vol. 13, no. 1, pp. 26–33, 2016.
- [28] T. Y. Chen and Pak-Lok Poon, “Experience with teaching black-box testing in a computer science/software engineering curriculum,” *IEEE Transactions on Education*, vol. 47, no. 1, pp. 42–50, Feb. 2004, doi: 10.1109/TE.2003.817617.