

## DEVELOPMENT OF AN ELECTRONIC PUBLIC COMPLAINTS SYSTEM TO IMPROVE PUBLIC SERVICES

Alfry Aristo J Sinlae<sup>1\*</sup>; Yeni Daniarti<sup>2</sup>; Dedy Alamsyah<sup>3</sup>; Amat Damuri<sup>4</sup>

<sup>1</sup>Ilmu Komputer  
Universitas Katolik Widya Mandira  
<https://www.unwira.ac.id/>  
alfry.aj@unwira.ac.id

<sup>2,3</sup>Teknik Informatika  
Universitas Muhammadiyah Tangerang  
<https://umt.ac.id/>  
yenidaniarti@umt.ac.id, dedy.alamsyah@umt.ac.id

<sup>4</sup>Manajemen Informatika  
STMIK Al Muslim Bekasi  
<https://almuslim.ac.id/>  
amat.damuri@almuslim.ac.id

(\*) Corresponding Author

**Abstract**— Public complaints are essential for the government to see how successful it is in carrying out activities. Public complaints are an essential element for local agencies because complaints are aimed at correcting the shortcomings of the activities that have been carried out. The absence of an electronic complaint system will hamper the complaint reporting process, so repairing deficiencies in government agencies will be hampered. The delay in repairing deficiencies in the agency will, of course, also affect the services provided to the community. The government can certainly use technology development to improve public services from the government to the community. This study discusses the development of an online-based public complaint system with the website-based Extreme Programming (XP) method that the public can access so that complaint reports can be submitted in real-time. The results of testing the complaint system from the usability side show an average value of 88.7% in the excellent category, so the application is feasible to use and as needed.

**Keywords:** Complaint System, Extreme Programming, Public Service, Electronic Complaint, Government

**Abstrak**— Pengaduan masyarakat penting bagi pemerintah untuk melihat seberapa besar keberhasilan dalam melaksanakan kegiatan. Pengaduan masyarakat merupakan elemen penting bagi instansi daerah, karena pengaduan bertujuan memperbaiki kekurangan dari kegiatan yang sudah dilaksanakan. Belum adanya sistem pengaduan

*secara elektronik tentunya akan menghambat proses pelaporan pengaduan, sehingga perbaikan kekurangan pada instansi pemerintahan akan terhambat. Terhambatnya perbaikan kekurangan pada instansi tentunya akan berpengaruh juga pada pelayanan yang diberikan kepada masyarakat. Perkembangan teknologi tentunya dapat dimanfaatkan oleh pemerintah untuk meningkatkan pelayanan publik dari pemerintah kepada masyarakat. Penelitian ini membahas pengembangan sistem pengaduan masyarakat berbasis online dengan metode Extreme Programming (XP) berbasis website yang dapat diakses oleh masyarakat, sehingga penyampaian laporan pengaduan dapat tersampaikan secara realtime. Hasil pengujian sistem pengaduan dari sisi usability menunjukkan nilai rata-rata 88,7% dalam kategori baik, sehingga aplikasi layak untuk digunakan dan sesuai kebutuhan.*

**Kata Kunci:** Sistem Pengaduan, Extreme Programming, Pelayanan Publik, Pengaduan Elektronik, Pemerintah

### INTRODUCTION

The increasing public demand for good governance makes service delivery one of the sectors that need to be prioritized, especially regarding the management of public complaints in the public sector. For this reason, the government gives top priority in the field of service to complaints from the public. Good, efficient, and

effective services can provide hope for the fulfillment of a sense of justice in the community and ensure transparent and targeted management of state finances (Arifin et al., 2021).

Public service is one of the fields of study in Public Administration. This part of the study is essential for public administration because, in addition to determining the general direction that must be taken to master community issues, it can also be used to determine the scope of problems faced by the government so that the government can provide convenience to the community. Improving public services is one of the bureaucratic reforms to improve public services.

So far, it can be said that the quality of public services is still in poor condition. It can be proven by many public complaints about the quality of public services, which are submitted directly to the public service unit and its apparatus (Firmansyah & Tohir S, 2018). This results in the service received by the community are not optimal, resulting in a decrease in the level of public trust in the running public service system.

The rapid development of information technology has covered various aspects of life, mainly supported by infrastructure in the form of the internet. The government can utilize the development of information technology to improve public services from the government to the community through more accessible access to information and more efficient and transparent management of government activities. As a follow-up, the government must adopt and apply it to public services (Nurkholis, Susanto, & Wijaya, 2021). The utilization of technology in the form of information systems can provide efficiency in terms of facilitating human work to be faster and more accurate.

Developing an information system that is carried out carefully and planned is needed. So a system development methodology is needed to plan system development by the cases encountered in system development. The system development methodology is a framework that becomes the basis for software design and development to produce applications that meet an organization's business needs (Ahmad, Borman, Fakhrurozi, & Caksana, 2020). Several software development methodologies include prototype, waterfall, RAD, and agile development (Dewi, Ciptayani, & Wijaya, 2018). The agile development approach has been introduced to make software engineering flexible and efficient. Agile software development is a methodology based on iterative development, in which the requirements of each stage and the solutions offered develop with an organized collaborative approach between teams (Mahendra & Yanto, 2018). One branch of the agile

development method that is used to suit development needs is extreme programming (XP). XP is a software engineering development that can be used for system development with unclear or swift requirements changes (Carolina & Supriyatna, 2019).

From several previous studies, the application of the XP system development method has worked well. Stages in XP have helped in producing applications that meet the functional requirements. Another research on extreme programming (XP) for the design and construction of a residence certificate management application (Rusdiana, 2018) shows that the XP method can be applied in building simple applications that do not require software repetition stages and based on black-box testing, it is found that XP produces applications that meet the needs. Previous studies have shown that the XP system development method can produce applications that meet the needs because it goes through iterative and incremental stages.

In this study, a public complaint information system will be developed by applying the extreme programming (XP) system development method that makes it easier for the public to submit complaints reports related to population registration services, civil registration services, management of population administration information, and utilization of data and service innovations.

## MATERIALS AND METHODS

This research refers to the Extreme Programming (XP) system development methodology. XP is a methodology in agile software development methodologies that focuses on coding, which is the main activity in all stages of the software development cycle (Gumelar, Astuti, & Sunarni, 2017). XP is a method that is responsive to changes (Borman, Priandika, & Edison, 2020). There are iterations in the XP method that can be repeated as needed. XP offers stages in a short time and repeats for different parts according to the focus to be achieved. Stages of software development with XP include planning (planning), design (design), coding (coding), and testing (testing) (Suryantara, 2017). The stages of XP can be seen in Figure 1 below.

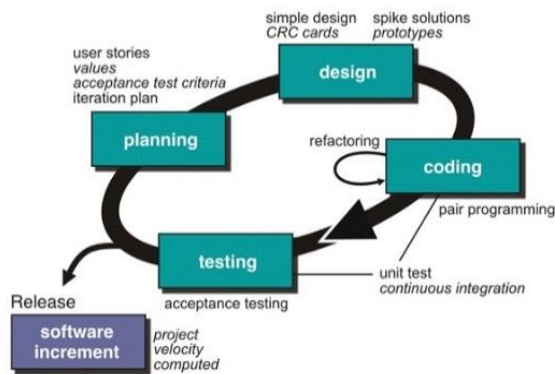


Figure 1. Extreme Programming (XP) Method Phase

Based on Figure 1, the XP system development methodology stages were carried out in this study, and the following is an explanation.

#### A. Planning

The planning stage begins with understanding the business context of the application, defining the output, the features in the application, the function of the application created, and the application development flow (Suryantara, 2017). It can be said that this stage determines the overall functionality that will be developed in the system (Ahmad, Prastowo, Suwarni, & Borman, 2021). In this research, the planning stage begins with identifying problems and analyzing system requirements through a statement of functional requirements. The main problem in this research is how to develop an electronic complaint system to improve public services. Furthermore, based on these problems, the requirements or features of the developed system will be compiled.

#### B. Design

In this stage, a detailed system design will be carried out on how the system will run. A system design will be developed as a use case diagram at the design stage. The goal is to see the facilities or features that system users can do.

#### C. Coding

The coding stage translates the design into a programming language recognized by the computer (Melinda, Borman, & Susanto, 2018). In this study, the application is divided into the front-end and back-end. Coding using PHP programming language with Sublime Text 3 compiler and MySQL database.

#### D. Testing

The system that has been built must be tested first to find errors (Kumala, Borman, & Prasetyawan, 2018). This study uses usability testing, where testing is carried out to determine

whether users can learn and use the product to achieve its goals and how satisfied the user is with the application and its usefulness (Farouqi, Aknuranda, & Herlambang, 2018). The system testing phase is carried out using ISO 9126 testing.

## RESULTS AND DISCUSSION

The design of the public complaint information system was developed using the XP methodology, and the following are the results of each stage that has been carried out.

#### A. Planning

Planning activities begin with customer interviews to gather information about system requirements so that the business context of the system can be known. Listening to customers is then compiled as a functional requirements analysis. Functional requirements are needed to determine what processes can be carried out by the system and who can use the system that was built (Monica & Borman, 2017). The following are the functional requirements of the system to be developed:

##### 1) Admin

- a. Admin must first log in to the system by entering username and password.
- b. Admin can manage complaint reports that enter the system.
- c. Managing complaint reports can take several actions, namely viewing the details of the complaint report, responding to the complaint report, deleting the complaint report, and looking for the report.
- d. Admin can print complaint reports.

##### 2) Society

- a. The public can report complaints related to population registration services, civil registration services, management of population administration information, and the use of data and service innovations.
- b. The public can see the status of the complaint by searching by complaint number.

#### B. Design

In the extreme programming (XP) system development method, the system design is done using use case diagrams. The use case is described textually in the form of a use case scenario which aims to explain the interaction between actors and the system, then illustrated in the form of a use case diagram to describe the context of the system being developed (Kurniawan, 2018). *Use case diagrams to describe the expected functionality of a system* (Borman & Fauzi, 2018). The design of the use case diagram of the public complaint information system can be seen in Figure 2 below.

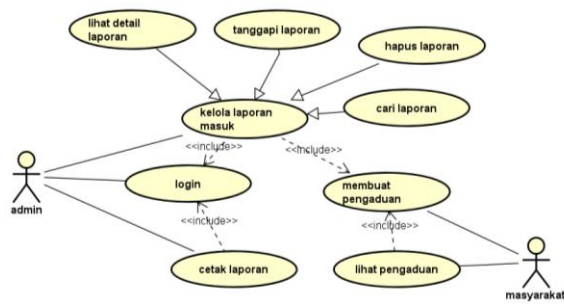


Figure 2. Use Case Diagram of Public Complaint Information System

C. Coding

After the design is done, it is implemented as a program code. Coding using PHP programming language with Sublime Text 3 compiler and MySQL database. By the functional requirements set, this public complaint information system will be used by the admin and the public. Figure 3 displays the complaint form that the public can fill out.

Figure 3. Complaint report input form

Furthermore, after the community has filled out the complaint report periodically, the public can view the status of the complaint report through the View Complaints Report page by entering the complaint number, as shown in Figure 4.

Figure 4. View the complaint report page

Admins can enter the system on the admin page by logging in first. After that, the admin will see a dashboard, as shown in Figure 5.

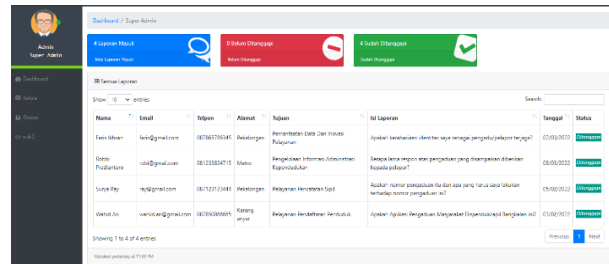


Figure 5. Admin Dashboard

Admins can see the dashboard all complaint reports. In addition, admins can access several menus, namely the Manage and export menus. On the Manage menu, admins can manage incoming complaint reports with several actions, such as viewing report details, responding or replying to complaints, and deleting complaint reports. The Manage complaint report page can be seen in Figure 6.

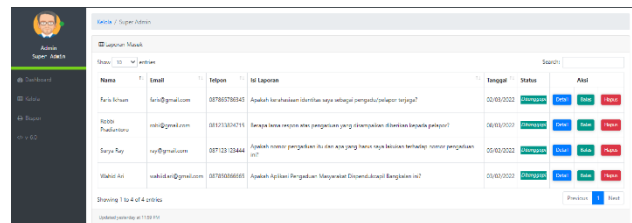


Figure 6. Complaint Report Management Page

The final output produced by this public complaint information system is a complaint data report, as shown in Figure 7.

Data Pengaduan

Nama	Email	Telepon	Alamat	Tujuan	Isi Laporan	Tanggal	Status
Alfy Ansh	alfy@gmail.com	087865786545	Perumahan	Perumahan Data Dan Informasi Peternakan	Apakah layanan identitas saya sebagai pengaduan/pelapor terpadu?	02/03/2022	Ditanggapi
Robby Pradantoro	robby@gmail.com	081233204713	Metro	Pengambilan Informasi Administrasi Kependudukan	Bagaimana respon atas pengaduan yang disampaikan dibarengi kepada pelapor?	06/03/2022	Ditanggapi
Surya Ray	ray@gmail.com	087123123444	Perumahan	Pelayanan Pencatatan Sipil	Apakah nomor pengaduan itu dan apa yang harus saya lakukan terhadap nomor pengaduan ini?	05/02/2022	Ditanggapi
Wahid Ari	wahidari@gmail.com	087808888888	Kampung Anyar	Pelayanan Pendaftaran Penduduk	Apakah Aplikasi Pengaduan Masyarakat Dpendukacipi Bangkalan ini?	03/02/2022	Ditanggapi

Figure 7. Complaint Report

D. Testing

Before the community uses the application, testing is carried out based on usability testing. Usability is one aspect of software quality Based on ISO 9126. ISO 9126 is a model used to evaluate software quality to provide standard standards in software projects (Supriyono et al., 2019). There are four sub-criteria in the usability aspect: understandability, learnability, operability, and attractiveness (Jamil, Saputra, Wahid, & Riana, 2021). Of the four sub-criteria, there are ten questions in the form of a questionnaire. The questionnaire was made using the Guttman scale, where certain statements are more extreme than other statements, or in other words, there are only two answers, namely agree and disagree. Questionnaires were distributed to 100 respondents from the general public. Figure 8 is the result of usability testing.

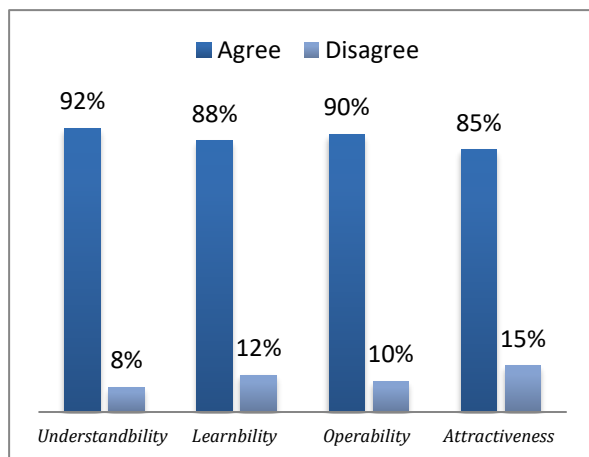


Figure 8. Usability Test Results

Usability test results, then converted into the following criteria: Good, with a value of 76%-100%; Enough, with a value of 56%-75%; Less Good, with a value of 40%-55%, while Less Good, has a value of less than 40% (Borman & Purwanto, 2019). From the usability testing results, the average value of usability or ease of use is 88.7% in the good category.

## CONCLUSION

Based on the research that has been done, it can be concluded that the extreme programming (XP) method produces software in a short time and produces software that fits the needs. In addition, the development of an electronic public complaint system using XP can be accepted by the public because, based on usability testing, it shows an average value of 88.7% in the excellent category, so the application is feasible to use and as needed.

## REFERENCE

Ahmad, I., Borman, R. I., Fakhrurozi, J., & Caksana, G. G. (2020). Software Development Dengan Extreme Programming (XP) Pada Aplikasi Deteksi Kemiripan Judul Skripsi Berbasis Android. *Jurnal Invotek Polbeng - Seri Informatika*, 5(2), 297–307.

Ahmad, I., Prastowo, A. T., Suwarni, E., & Borman, R. I. (2021). Pengembangan Aplikasi Online Delivery Sebagai Upaya Untuk Membantu Peningkatan Pendapatan. *JMM (Jurnal Masyarakat Mandiri)*, 5(6), 4–12.

Arifin, N. Y., Borman, R. I., Ahmad, I., Tyas, S. S., Sulistiani, H., Hardiansyah, A., & Suri, G. P. (2021). *Analisa Perancangan Sistem Informasi*. Batam: Cendikia Mulia Mandiri.

Borman, R. I., & Fauzi, H. (2018). Penerapan Metode Perbandingan Eksponensial (MPE) Dalam

Sistem Pendukung Keputusan Penerimaan Beasiswa Siswa Berprestasi Pada SMK XYZ. *CESS: Journal of Computer Engineering, System and Science*, 3(1), 17–22.

Borman, R. I., Priandika, A. T., & Edison, A. R. (2020). Implementasi Metode Pengembangan Sistem Extreme Programming (XP) pada Aplikasi Investasi Peternakan. *JUSTIN (Jurnal Sistem Dan Teknologi Informasi)*, 8(3), 272–277. <https://doi.org/10.26418/justin.v8i3.40273>

Borman, R. I., & Purwanto, Y. (2019). Impelementasi Multimedia Development Life Cycle pada Pengembangan Game Edukasi Pengenalan Bahaya Sampah pada Anak. *Jurnal Edukasi Dan Penelitian Informatika (JEPIN)*, 5(2), 119. <https://doi.org/10.26418/jp.v5i2.25997>

Carolina, I., & Supriyatna, A. (2019). Penerapan Metode Extreme Programming Dalam Perancangan Aplikasi Perhitungan Kuota SKS Mengajar Dosen. *Jurnal IKRA-ITH Informatika*, 3(1), 106–113.

Dewi, K. C., Ciptayani, P. I., & Wijaya, I. W. R. (2018). Agile Project Management Pada Pengembangan E-Musrenbang Kelurahan Benoa Bali. *Jurnal Teknologi Informasi Dan Ilmu Komputer (JTIK)*, 5(6), 723–730. <https://doi.org/10.25126/jtiik.201851143>

Farouqi, M. I., Aknuranda, I., & Herlambang, A. D. (2018). Evaluasi Usability Pada Aplikasi UBER Menggunakan Pengujian Usability. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 2(9), 2599–2606.

Firmansyah, C., & Tohir S, C. (2018). Sistem Layanan Pengaduan Masyarakat Lingkup Desa Gununganjung Berbasis Web dan SMS Gateway Dengan Metode Antrian FIFO. *JUMANTIKA*, 01(01), 201–210.

Gumelar, T., Astuti, R., & Sunarni, A. T. (2017). Sistem Penjualan Online Dengan Metode Extreme Programming. *Jurnal Telematika*, 9(2), 87–90.

Jamil, M., Saputra, S. F., Wahid, M. I., & Riana, D. (2021). Evaluasi Metode ISO / IEC 9126 pada Kinerja Website Sistem Informasi Akademik Perguruan Tinggi. *Informatika Mulawarman : Jurnal Ilmiah Ilmu Komputer*, 16(1), 27–31.

Kumala, A. E., Borman, R. I., & Prasetyawan, P. (2018). Sistem Informasi Monitoring Perkembangan Sapi Di Lokasi Uji Performance (Studi Kasus: Dinas Peternakan Dan Kesehatan Hewan Provinsi Lampung). *Jurnal Tekno Kompak*, 12(1), 5. <https://doi.org/10.33365/jtk.v12i1.52>

Kurniawan, T. A. (2018). Pemodelan Use Case (UML): Evaluasi Terhadap beberapa Kesalahan dalam Praktik. *Jurnal Teknologi Informasi Dan Ilmu Komputer*, 5(1), 77–86. <https://doi.org/10.25126/jtiik.201851610>

- Mahendra, I., & Yanto, D. T. E. (2018). Agile Development Methods Dalam Pengembangan Sistem Informasi Pengajuan Kredit Berbasis Web (Studi Kasus: Bank BRI Unit Kolonel Sugiono). *Jurnal Teknologi Dan Open Source*, 1(2), 13–24.
- Melinda, M., Borman, R. I., & Susanto, E. R. (2018). Rancang Bangun Sistem Informasi Publik Berbasis Web (Studi Kasus : Desa Durian Kecamatan Padang Cermin Kabupaten Pesawaran). *Jurnal Tekno Kompak*, 11(1), 1. <https://doi.org/10.33365/jtk.v11i1.63>
- Monica, T., & Borman, R. I. (2017). Implementasi Konsep Media Sosial Dalam Sistem Informasi Kegiatan Kesiswaan (Studi Kasus : SMK XYZ). *Jurnal Tekno Kompak*, 11(2), 33–37. <https://doi.org/10.33365/jtk.v11i2.64>
- Nurkholis, A., Susanto, E. R., & Wijaya, S. (2021). Penerapan Extreme Programming dalam Pengembangan Sistem Informasi Manajemen Pelayanan Publik. *Jurnal Sains Komputer & Informatika (J-SAKTI)*, 5(1), 124–134.
- Rusdiana, L. (2018). Extreme Programming Untuk Rancang Bangun Aplikasi Pengelolaan Surat Keterangan Kependudukan. *Register: Jurnal Ilmiah Teknologi Sistem Informasi*, 4(1), 49. <https://doi.org/10.26594/register.v4i1.1191>
- Supriyono, S., Anindya K, V., Kadir, N., Febriana, J., Rahayu, E. P., & Prily, H. (2019). Penerapan ISO 9126 Dalam Pengujian Kualitas Perangkat Lunak pada E-book. *MATICS: Jurnal Ilmu Komputer Dan Teknologi Informasi*, 11(1), 9–13.
- Suryantara, I. G. N. (2017). *Merancang Aplikasi dengan Metodologi Extreme Programming*. Jakarta: PT. Elex Media Komputindo.