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Analysis Of Good Manufacturing Practices (GMP) Training Information System Design Using Extreme Programming (XP) Methods

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Abstract: This research is about the Good Manufacturing Practices (GMP) Training Information System. Apart from that, the author is trying to carry out an analysis of the design of the Good Manufacturing Practices (GMP) information system. The aim is to carry out tests to reduce problems that exist at the research site, PT employee tools. XYZ for training and GMP tests as well as getting the final results of the GMP tests carried out by employees. The method used in the research is literature study, interviews and observation. The results of this research show that system quality can make it easier to carry out GMP training. So it can be concluded that the resulting value still shows the suitability of the system to be implemented in accordance with the real system.

Keyword: Information System, GMP, Manufacture

INTRODUCTION

Science and technology are currently developing rapidly, in proportion to increasingly complex human problems. However, human ability to think and remember is limited. Good Manufacturing Practice (GMP) is a system that contains minimum requirements that must be met by the food, cosmetics and other packaging industries related to food safety, quality and legal requirements. In order to guarantee consumers, companies must provide clean and hygienic products. Therefore, GMP training is needed so that employees know the importance of maintaining the cleanliness and quality of the products produced. In the current era of globalization, various types of similar products are circulating on the market with similar or the same prices and functions (Prayitno et al., 2023). UML is an information system modeling standard that allows the creation of standardized diagrams based on related specifications to increase communication participation from all employees (Fried Sinlae & Samidi, 2021a). This desktop website can make it easier for cheap shop managers to do bookkeeping and manage cheap shops (Fried Sinlae & Samidi, 2021b). With decision support in recruiting new employees, it becomes easier for the warehouse department to select employees who meet the criteria, without having to select a lot of documents (Sinlae, 2023). Good manufacturing practices (GMP) are thus instrumental to ensure the quality of processes and obtained products

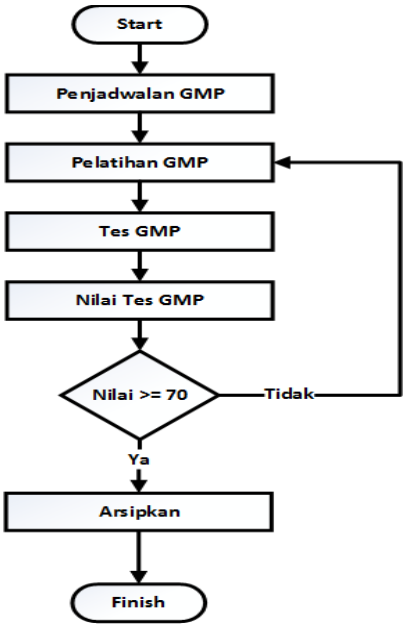
(Souto et al., 2020). GMP is part of the Hazard Analysis Critical Control Practices (HACCP) system which functions to minimize or even eliminate food quality problems that can be caused by several factors such as biology, physics and chemistry. For small and medium industries, implementing GMP is useful for obtaining a P-IRT certificate which shows that Home Industries (IRT) produce quality food, safe and good for consumption (Maulina Dewi & Anggraeni, 2022). GMP in the aspects of hygiene and sanitation facilities and activities, employee health and hygiene, as well as maintenance and hygiene and sanitation programs by the factory (SUDARYANTININGSIH & PAMBUDI, 2022). Good manufacturing practice is the responsibility of the top management of the manufacturing company and refers to the conditions required to ensure adequate facilities for personnel, equipment and machinery (Levent ALPARSLAN, 2022). Practice (GMP) represents the gold-standard to ensure the quality, safety and efficacy of medicinal products, either investigational or approved. In practice, the implementation of GMP rules for phage therapy medicinal products benefits from the long history of vaccine development. Accordingly, a well-structured strategy can be defined for each medicinal product, taking into account the specified indication (i.e., the target bacteria species, the infected site, the route of administration, the product composition) (Bretaudeau et al., 2020). GMP training and assistance are critically needed to help the SMEs in improving the legen quality. The findings also indicated that implementing GMP in business practices becoming an important factor to achieve sustainable development (Putri et al., 2023). Sanitation practices greatly influence the occurrence of microorganism contamination, so good production practice procedures or Good Manufacturing Practices (GMP) and sanitation procedures or Sanitation Standard Operating Procedures (SSOP) must be implemented to maintain cleanliness (Afrila et al., 2023).

METHOD

In the research carried out by the author, there are several steps in the research flow, namely starting from identifying the problem by conducting interviews and observations at the research site, after that limiting the problem that the author will try to solve in this research. The problems that the author raises are not only at the research site but the discussion which according to the author is most densely packed with the problems that the author has explained in the first chapter. In this problem identification stage the author tries to find the problems that exist at PT. XYZ by observing GMP tests which are carried out twice a year. Apart from that, the author tries to describe the GMP test procedures which are currently still carried out conventionally. Next, the author looks for literature that is appropriate to the research topic as a data collection method to look for supporting theories. After that, the author carried out an analysis of the design of the GMP information system at PT. XYZ uses the Extreme Programming method for the author, this method is very appropriate for developing devices on a company scale.

In the next stage of this research, using the Extreme Programming method, the author designs the information system that will be created. In this scheme the author has described the GMP procedures carried out obtained from the results of interviews with PT warehouse supervisors. XYZ. Starting from scheduling GMP times and days for mentors and participants. The GMP training carried out consisted of explaining to participants the GMP material explained by the foreman of each division in PT's warehouse department. XYZ. After that, participants were given written test questions to complete as a parameter of the extent of GMP participants' understanding of the material presented by the division foreman. The answers to the written test will later be evaluated as to how much the employee understands GMP. If the participant's answer is equal to or more than seventy then the participant is declared to have passed GMP and the written test answers are archived as proof that the employee has taken the

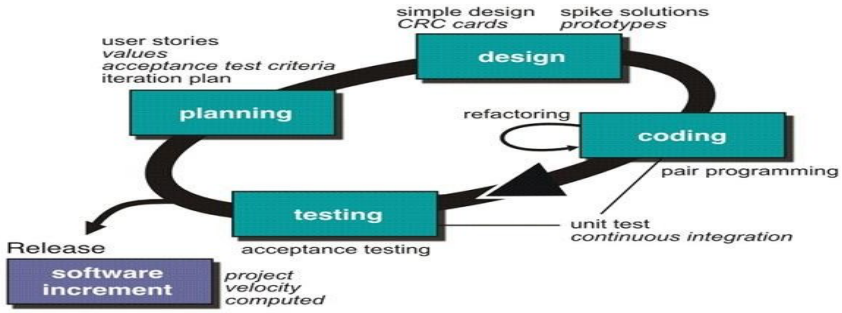
GMP written test. If the participant's score is less than seventy then the participant takes the GMP training again.



Source: Research Data

Figure 1. GMP Flow

Extreme Programming has 4 stages, namely planning, designing, coding and testing. Planning is the basis for obtaining user needs such as user story aspects, value, acceptance test criteria and iteration plans (Pasha et al., 2023). System analysis and design, modeling software requirements that must be adapted to the requested requirements using UML. The system development or construct stage is the stage of creating the entire system using coding or programming language. Black-box testing focuses on the functional requirements of the software (Wahyuningsih, 2023).



Source: (Pressman, 2010)

Figure 2. Extreme Programming Method

RESULTS AND DISCUSSION

The data modeling stage is carried out after the business modeling stage has been completed and clearly defined. In this stage, it is described in more detail based on the next stage so that detailed data and process flow of the GMP information system are obtained through a table structure.

Table 1. GMP Schedule

Nama Field	Tipe	Lebar	Index	Deskripsi
id_jadwal_gmp	int	11	*	Id jadwal GMP yang dibuat
kd_divisi	varchar	11	**	Kode divisi
kd_materi	varchar	11	**	Kode materi GMP

nip_foreman	varchar	20	**	Nomor Induk Foreman
hari	varchar	20		Hari pelaksanaan GMP
jam_mulai	time			Waktu GMP dimulai
jam_selesai	time			Waktu GMP selesai

Source: Research data

Table 2. GMP Answers

Nama Field	Tipe	Lebar	Index	Deskripsi
id_jawaban_tugas	int	5	*	Id jawaban soal essay
nip_peserta	varchar	10	**	Nip peserta GMP
id_pertanyaan	int	10	**	Id pertanyaan essay
jawaban_tugas	text			Jawaban peserta GMP
waktu_tugas	timestamp			Waktu pertanyaan dijawab

Source: Research data

Table 3. GMP Objective Answers

Nama Field	Tipe	Lebar	Index	Deskripsi
id_jawaban_objektif	int	5	*	Id jawaban soal pilihan ganda
nip_peserta	varchar	10	**	Nip peserta
id_pertanyaan_objektif	int	10	**	Id pertanyaan pilihan ganda
jawaban	char	1		Jawaban pilihan ganda
waktu_objektif	timestamp			Waktu pilihan ganda dijawab

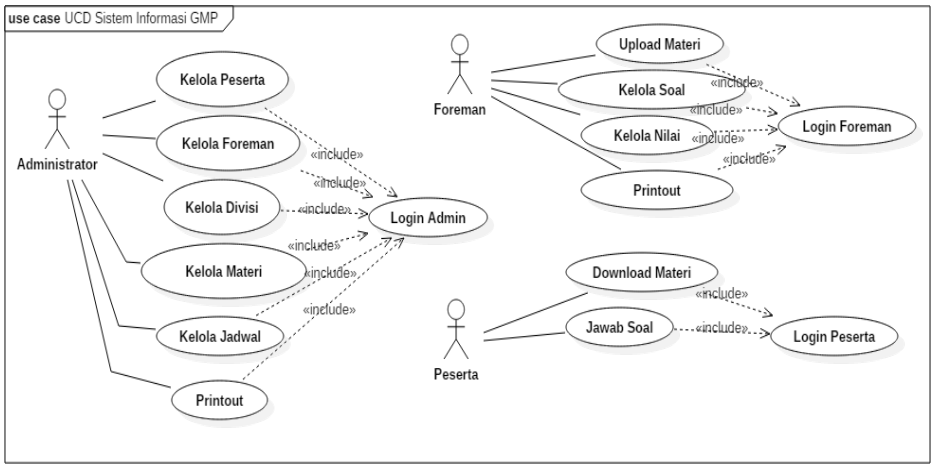
Source: Research data

Table 4. GMP Value

Nama Field	Tipe	Lebar	Index	Deskripsi
id_nilai tugas	int	5	*	Id nilai essay
id_tugas	int	5	**	Id tugas GMP
nip_peserta	varchar	11	**	Nip peserta
nilai_tugas	int	11		Nilai essay

Source: Research data

The diagram presents the interaction between use cases and actors. Where, actors can be people, equipment or other systems that are being built. Use cases describe the system functionality or requirements that the system must fulfill from the user's perspective.



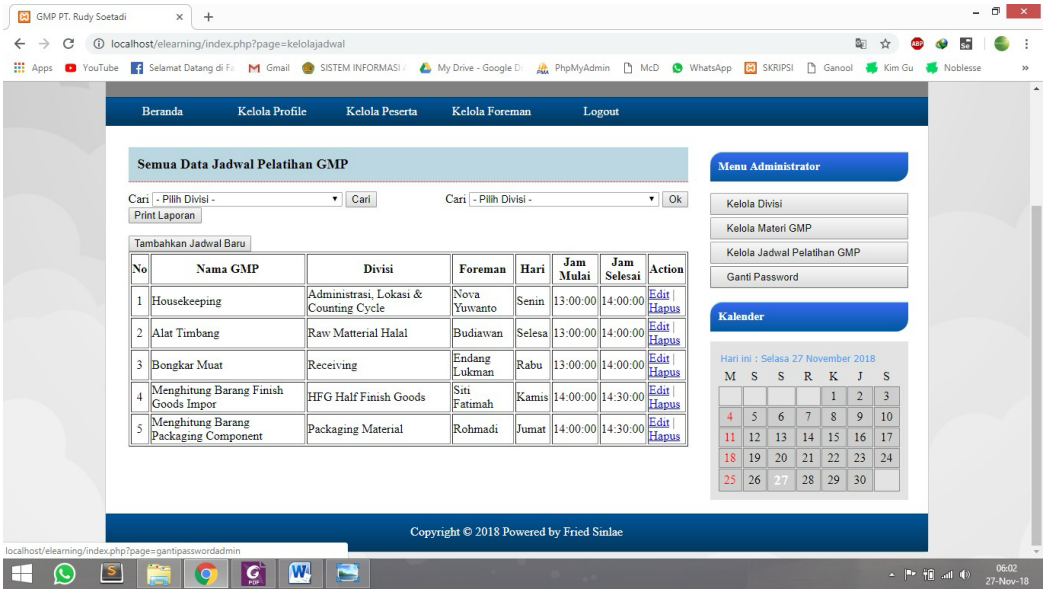
Source: Research Data

Figure 3. Use Case Diagram GMP Information System

Table 5. Use Case Description

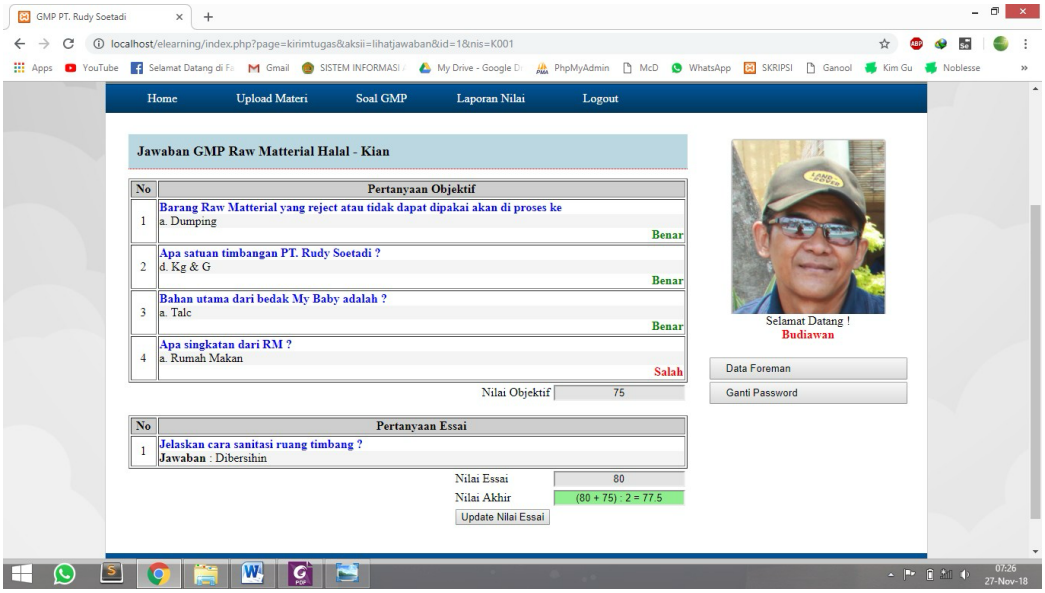
Use Case Name	Description	Actor
Login	*Use Case* menggambarkan kegiatan memasukkan *username* dan *password* untuk mengakses sistem	Administrator, Foreman dan Peserta
Kelola Peserta	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan peserta	Administrator
Kelola Foreman	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan foreman	Administrator
Kelola Divisi	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan divisi	Administrator
Kelola Materi	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan materi	Administrator
Kelola Jadwal	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan jadwal	Administrator
Printout	*Use Case* menggambarkan kegiatan mencetak laporan data peserta, foreman, divisi, materi dan jadwal GMP	Administrator
Upload Materi	*Use Case* menggambarkan kegiatan *download*, hapus dan upload materi	Foreman
Kelola Soal	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan soal objektif dan essay	Foreman
Kelola Nilai	*Use Case* menggambarkan kegiatan lihat data, hapus, edit, dan tambahkan nilai essay	Foreman
Printout	*Use Case* menggambarkan kegiatan mencetak laporan Jadwal GMP	Foreman
Download Materi	*Use Case* menggambarkan kegiatan mendownload materi GMP	Peserta
Jawab Soal	*Use Case* menggambarkan kegiatan menjawab soal tes GMP	Peserta

Source: Research data



Source: Research Data

Figure 4. Manage Schedule



Source: Research Data

Figure 5. Manage Value

The black box testing method is a functional test that is carried out after the system has been created and tested on users. In this testing system, it is carried out by testing all existing navigation, so that it can produce output that is in accordance with the desired design.

Table 6. Testing Using the Blackbox Method

Deskripsi Pengujian	Skenario Pengujian	Hasil Yang Diharapkan	Hasil Uji	Waktu & Memori Terpakai
Login	Input Username dan Password User	Login Berhasil, dan menampilkan Home User	Sesuai	0.14 Detik 0.33 MB
Kelola Peserta	Create, Read, Update dan Delete (CRUD) Data Peserta	Data Peserta Tersimpan dan Muncul Tampilan Selesai	Sesuai	0.15 Detik 0.32 MB
Kelola Foreman	Create, Read, Update dan Delete (CRUD) Data Foreman	Data Foreman Tersimpan dan Muncul Tampilan Selesai	Sesuai	0.7 Detik 0.32 MB
Kelola Divisi	Create, Read, Update dan Delete (CRUD) Data Divisi	Data Divisi Tersimpan dan Muncul Tampilan Selesai	Sesuai	0.78 Detik 0.32 MB
Kelola Materi	Create, Read, Update dan Delete (CRUD) Materi	Data Materi Tersimpan	Sesuai	0.24 Detik 0.32 MB
Kelola Jadwal	Create, Read, Update dan Delete (CRUD) Data Jadwal	Data Jadwal Tersimpan dan Muncul Tampilan Selesai	Sesuai	0.14 Detik 0.34 MB
Printout Administrator	Cetak Laporan GMP	Data Berhasil Dicetak	Sesuai	0.36 Detik 0.15 MB
Upload Materi	Upload Materi GMP	Data Berhasil Diupload	Sesuai	0.69 Detik 0.34 MB
Kelola Soal	Create, Read, Update dan Delete (CRUD) Data Soal	Soal Berhasil Disimpan	Sesuai	0.38 Detik 0.34 MB
Kelola Nilai	Isi Nilai Essai	Nilai Berhasil Diisi	Sesuai	0.61 Detik

					0.34 MB
Printout	Cetak Jadwal GMP	Data Berhasil Dicetak		Sesuai	0.07 Detik 0.15 MB
Download Materi	Download Materi GMP	Data Didownload	Berhasil	Sesuai	0.45 Detik 0.34 MB
Jawab Soal	Jawab Soal GMP	Jawaban Disimpan	Berhasil	Sesuai	0.65 Detik 0.33 MB

Source: Research data

CONCLUSION

This GMP Information System is expected to carry out GMP tests on PT employees. XYZ becomes easier to implement with the features of uploading material, downloading material, managing questions and answering GMP questions on this system which can help PT. XYZ to carry out GMP training on time and continuously. With this system, it is hoped that it can eliminate the use of paper used by the current system to make it easier to search for GMP training data without having to open document files. It is hoped that the GMP test results from this system will serve as an evaluation for warehouse employees to find out how far they understand GMP itself.

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