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Operational Planning at Klinik Harmoni Fisioterapi

Dimas Aryo Wibowo*, Rhian indradewa, Ferryal Abadi, Rina Anindita
Universitas Esa Unggul, Indonesia
Email: dimasawibowo@student.esaunggul.ac.id*, rhian.indradewa@esaunggul.ac.id, ferryal@esaunggul.ac.id, rina.anindita@esaunggul.ac.id

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System integration; physiotherapy; smart clinic; robotic therapy; hydrotherapy.

Abstract

This study examines the operational planning system implemented at Klinik Harmoni Fisioterapi as an effort to develop integrated and technology-based physiotherapy services. The increasing prevalence of stroke and neuromusculoskeletal disorders has increased the demand for rehabilitation services that are efficient, measurable, and patient-centered. However, many physiotherapy clinics still experience operational limitations, including manual registration systems, unintegrated medical records, and ineffective service coordination. Therefore, this research aims to analyze the operational planning model of Klinik Harmoni Fisioterapi in integrating digital systems, physiotherapy technology, and service management within a smart clinic framework. This study employed a descriptive qualitative approach using a case study method. Data were collected through interviews, document analysis, and literature studies related to operational management, healthcare information systems, and physiotherapy services. The findings reveal that the implementation of digital registration, therapy scheduling, electronic medical records, robotic physiotherapy, hydrotherapy, and quality management systems significantly improves operational efficiency, service consistency, and patient experience. In addition, the integrated system supports better coordination among healthcare personnel and facilitates data-driven managerial decision-making. In conclusion, the operational planning model implemented at Klinik Harmoni Fisioterapi can serve as a strategic framework for the development of modern, sustainable, and technology-oriented physiotherapy services.

INTRODUCTION

Clinics as one of the public health service institutions require the existence of an accurate and reliable information system, which is sufficient to improve health services to patients and other related environments (Putry et al., 2021). The increasing prevalence of stroke and neuromusculoskeletal disorders in Indonesia poses a serious challenge to the healthcare system, particularly rehabilitation and physiotherapy services. This situation demands the availability of physiotherapy services that are not only clinically effective but also operationally efficient and integrated with modern technology (Qomaruddin et al., 2025; Sadhuadi et al., 2024). Patients with post-stroke and musculoskeletal disorders require a continuous, measurable, and consistent rehabilitation process to restore motor function and increase independence in daily activities. However, in practice, many physiotherapy services still face operational system limitations, such as manual registration processes, unintegrated medical recording, and suboptimal coordination of therapy services (Hidayati & Rusmiani, 2024). With the support of current information technology, systems that currently operate conventionally can be replaced

with an information system that utilizes technological advances (Putra & Syarif, 2020).

Clinics as public health service institutions are increasingly required to provide fast, accurate, integrated, and patient-centred services (Suhartini et al., 2023; Widiyana et al., 2021). This demand is especially important in rehabilitation and physiotherapy services, where patients often require repeated visits, structured therapy schedules, continuous monitoring, and well-documented clinical progress. The attached manuscript positions Klinik Harmoni Fisioterapi as a modern physiotherapy clinic that integrates digital registration, therapy scheduling, electronic medical records, robotic therapy, hydrotherapy, and operational management into one service framework (Suryadi et al., 2022; Siahaan et al., 2025).

Globally, rehabilitation has become a major health priority because the number of people who need rehabilitation services continues to increase. WHO estimates that around 2.41 billion people live with health conditions that could benefit from rehabilitation, an increase of 63% since 1990. Stroke also remains a major contributor to rehabilitation demand, with nearly 12 million new stroke cases each year and one in four adults over 25 expected to experience stroke during their lifetime.

In Indonesia, the need for physiotherapy and rehabilitation services is also increasingly relevant due to the rising burden of stroke and neuromusculoskeletal disorders. Riskesdas 2018 reported that stroke prevalence increased from 7 per 1,000 population in 2013 to 10.9 per 1,000 population in 2018. This condition shows that rehabilitation clinics must not only provide therapeutic interventions, but also develop operational systems that can support service continuity, patient safety, and measurable recovery outcomes (Fridslan et al., 2023; Yusran et al., 2022).

The specific issue addressed in this research is the operational planning of Klinik Harmoni Fisioterapi, particularly how the clinic designs service workflows, digital systems, facility layout, therapy packages, quality management, and physiotherapy technology integration. The manuscript explains that many physiotherapy services still face limitations such as manual registration, unintegrated medical records, inefficient scheduling, and weak coordination between clinical and administrative units (Br Simanjuntak & Efendi, 2023). These problems may reduce service efficiency and affect patient experience.

Previous studies have shown the importance of digital information systems in improving healthcare service management. Putry et al. (2021) emphasized that clinics require accurate and reliable information systems to improve patient services, while Putra and Syarif (2020) argued that conventional clinical systems can be replaced with technology-based information systems. The manuscript also refers to Laksono et al. (2023), who highlighted that effective clinical information systems can improve service quality and facilitate clinical data management.

Recent research further supports the importance of electronic health records in physiotherapy practice. Fernandes et al. (2025) mapped the use of electronic health records in physiotherapy and showed that EHR systems are increasingly relevant for documentation, clinical decision support, service coordination, and professional accountability. Meanwhile, recent studies on smart clinics and rehabilitation technology indicate that AI, IoT, robotic rehabilitation, and digital monitoring can improve personalized care, therapy planning, and patient progress evaluation.

However, most previous studies tend to focus separately on clinical information systems,

electronic medical records, digital registration, or rehabilitation technology. Limited research has integrated these elements into a comprehensive operational planning model for a physiotherapy clinic. This creates a research gap, because physiotherapy service quality depends not only on technology availability, but also on how digital systems, human resources, facility layout, therapy workflows, equipment calibration, and quality management are organized into one operational framework (JIMP - Jurnal Informatika Merdeka Pasuruan, 5(2), 1–6; Nawwal et al., 2025).

The urgency of this research lies in the need to develop a physiotherapy clinic model that is responsive to increasing rehabilitation demand, especially for post-stroke, musculoskeletal, neurological, and post-surgical patients. Klinik Harmoni Fisioterapi offers several therapy packages, including robotic physiotherapy, hydrotherapy, electrical stimulation, ultrasound therapy, infrared radiation, and exercise-based rehabilitation. Therefore, integrated operational planning is essential to ensure that these services are delivered efficiently, safely, and consistently.

The novelty of this research is the development of an integrated operational planning model for a physiotherapy clinic that combines smart clinic application design, digital registration, therapy scheduling, electronic medical records, facility layout planning, physiotherapy equipment management, quality control, and advanced therapy services such as robotic therapy and hydrotherapy. Unlike previous studies that mainly discuss information systems in general clinics, this research focuses specifically on the operational needs of a modern physiotherapy clinic.

The purpose of this research is to analyze and design the operational planning system of Klinik Harmoni Fisioterapi as an integrated, technology-based, and patient-oriented physiotherapy service model. The objective is to explain how digital systems, service packages, clinical workflows, equipment management, spatial design, and quality control contribute to service efficiency and rehabilitation consistency. The contribution and benefit of this research are expected to provide a practical model for physiotherapy clinic development, support data-driven managerial decisions, improve patient experience, and strengthen sustainable rehabilitation services in Indonesia.

RESEARCH METHOD

This research employed a descriptive qualitative approach using a case study method at Klinik Harmoni Fisioterapi. The qualitative design was chosen to obtain an in-depth understanding of the operational planning system, service integration, and the implementation of smart clinic technology within the clinic environment. The case study method allows exploration of organizational processes in a real-life context.

Research Object

The object of this study is the integrated operational planning system at Klinik Harmoni Fisioterapi, which includes service workflow, digital registration, therapy scheduling, electronic medical records, facility layout, and physiotherapy technology integration.

Data Sources

The study used two types of data sources:

1. Primary Data

Obtained through semi-structured interviews with clinic management and operational staff to understand service flow, operational planning, and system implementation.

2. Secondary Data

Collected from clinic operational documents, service SOPs, facility layout designs, equipment data, and related literature on operational management and clinical information systems.

Data Collection Techniques

Data was collected through:

1. Document Analysis: Reviewing operational planning documents, service procedures, technology utilization, and organizational planning records.
2. Interviews: Conducted with management and staff to validate operational processes and identify system integration practices.
3. Literature Study: Reviewing journals, books, and scientific publications related to operational planning, healthcare service systems, and smart clinic concepts to strengthen the theoretical foundation.

Data Analysis Technique

Data analysis followed qualitative descriptive analysis, consisting of:

1. Data Reduction: Selecting and focusing on relevant operational and system integration data.
2. Data Display: Organizing data into service flow diagrams, operational descriptions, and system models.
3. Conclusion Drawing: Interpreting how the integrated system contributes to service efficiency, error reduction, and rehabilitation consistency.

Validity of Data

Data validity was ensured through triangulation of sources, by comparing interview results, operational documents, and literature findings to maintain the credibility of conclusions.

RESULTS AND DISCUSSION

Operational planning is a crucial process in business management that aims to plan and organize daily operational activities that support the achievement of organizational goals. Operational planning focuses on how operational activities will be carried out, who is responsible for them, and how resources will be allocated to achieve operational targets efficiently and effectively (Laksono et al., 2023). By transforming input into outputs, operational management generates value in the form of goods and services. To realize these products and services, every organization performs three fundamental functions that are essential not only for production but also for organizational sustainability. Operational planning does not stand alone but is an integral part of the overall business plan. Therefore, its preparation must be neat and logical. Every operational activity must be clearly described. The goal is for all parties involved, such as management, employees, and business partners, to understand their roles and responsibilities and to follow the organization's work direction in harmony.

Company Establishment Stages

Establishing a business entity is a crucial first step before a business can officially

operate. Harmoni Physiotherapy Clinic chose a Limited Liability Company (PT) as its legal entity, a form of business entity with a formal structure and separate legal responsibilities from its owners. The establishment of a PT is based on "Law No. 40 of 2007," which regulates all matters related to PTs in Indonesia, including the requirements for establishment, which must be completed through a notary. However, establishment alone is not sufficient. To operate a business, particularly in the technology sector such as Physiotherapy Clinic, a company is also required to obtain an operational permit. This permit serves as proof that its business activities are legally valid and can operate in accordance with applicable regulations. To process this establishment, applicants need to prepare and upload several important documents as required, such as personal identification (KTP), tax identification (NPWP), and documents detailing the business owners and members of its management structure (directors, commissioners, etc.). This process is crucial for obtaining official approval as a state-recognized legal entity. There are specific rules governing the name application process for a PT (Limited Liability Company) to ensure the company name does not overlap with other companies and remains in accordance with applicable laws. These rules stipulate that a PT name must have at least three syllables, not be used by another entity, and must not contain words of foreign origin to maintain the company's authenticity and identity. Once the name is approved, the company's deed of establishment is processed through a notary, whose job is to prepare the legal documents and submit the permit application to the Ministry of Law and Human Rights. After the company's licensing process is complete, the company submits an Operational Permit application to PTSP (DPMPTSP) and the Health Office. Furthermore, before commencing operations, the company also needs to undertake various physical preparations, such as renting a building, renovating it to meet operational needs, designing a more efficient office layout, and purchasing necessary equipment to support smooth business operations (see the following image for more information).

Figure 1
Clinic Establishment and Licensing Process
Source: Process by Author

Company Goals and Objectives

To achieve the company's operational goals, PT Nuart Jidoka Utama (NJU) has planned a series of steps or stages. Each stage is systematically designed to ensure clear and measurable goals. As a concrete manifestation of this plan, the established stages will be explained or presented in the table below.

Table 1. Company Goals and Objectives

Category		Goals		Objectives
Short Term (0-2 Years)	1	Establishing cooperation with BPJS Kesehatan and other health institutions (Community Health Centers, Level I Health Facilities, and Partner Clinics).	1	Availability of official cooperation with BPJS and other health facilities.
			2	Increase the number of referral patients from partner health facilities.
	2	Monitoring patient service flow to improve efficiency and quality of service.	1	Patient wait times have decreased.
			2	Patient satisfaction has increased to >90%.
	3	Developing a platform digital (website, media social, e-reservation) (Agustino et al., 2022; Ekadianti et al., 2024).	1	Improving access to information and ease of service for patients.
			2	Increasing public engagement and awareness of the Harmoni Physiotherapy Clinic.
	4	Carry out regular maintenance and calibration of medical devices according to manufacturer standards.	1	Maintaining the quality and accuracy of medical devices.
			2	Meeting patient safety and security standards.
	5	Provide one operational vehicle unit for team mobility and off-site services.	3	Support operational activities and service promotion.
			4	Facilitating access to homecare services.
	6	Collaborating with the physiotherapy community for the Bekasi City area.	1	Expanding professional networks and educating the public about the importance of physiotherapy.
Medium Term (3-5 Years)	1	Building a new branch of Harmoni Physiotherapy Clinic in a strategic area.	1	Expanding service coverage to various major cities.
			2	Increase the business scale and brand recognition of the clinic.
	2	Improving the quality and performance of digital platforms and patient data integration.	1	The availability of a centralized and easily accessible patient information system.
			2	Improve the efficiency of clinical administration and services.
	3	Carrying out facility re-accreditation activities and extending cooperation with BPJS and other stakeholders.	1	Ensuring the sustainability of operational permits and strategic cooperation.
			2	Maintaining the clinic's reputation and credibility.
	4	Adding features that can make it easier for mobile users and minimize bugs/errors.	1	Simplify the process of getting information about the Klinik Harmoni Fisioterapi.
			2	Ensuring that people can access it via mobile.
			3	Perform system updates regularly.
	5	Carry out maintenance on medical devices in accordance with the after-	1	Ensure service is performed on time.

Category	Goals		Objectives	
		sales warranty to ensure the quality of the medical devices is maintained, as well as regular calibration.	2	Maintaining the accuracy of physiotherapy equipment for operation.
			3	Ensure that the physiotherapy equipment functions optimally.
	6	Procurement of operational vehicles and home visits.	1	Optimizing visits to stakeholders, schools, and the community.
	7	Collaboration with the Greater Jakarta area physiotherapy community.	2	Ensuring that patient care is handled effectively and appropriately.
Long Term (>5 Years)	1	Establish a physiotherapy training and research center.	1	Producing research-based therapeutic innovations.
			2	Becoming a national reference in the field of modern physiotherapy.
	2	Conduct maintenance and collaborate with suppliers to ensure regular service and calibration of medical equipment. Enhance the digitalization of services with an AI-based smart clinic system and telehealth.	1	Ensure timely service.
			2	Maintain the operational accuracy of physiotherapy equipment.
			3	Ensure optimal function of physiotherapy equipment.
	3	Enhance the digitalization of services with an AI-based smart clinic system and telehealth.	1	Providing a fast, precise, and personalized service experience.
			2	Strengthening the clinic's position as a provider of modern physiotherapy services.
	4	Establish a physiotherapy training and research center.	1	Sustainably increase annual revenue.
			2	Maintain operational efficiency and employee well-being.

Source: Prepared by the Authors (2026).

Service Design

Klinik Harmoni Fisioterapi is committed to providing standardized physical recovery services that are oriented towards patient satisfaction, which is implemented through a two-shift operational system every Monday to Friday (08.00–21.00 WIB) and weekends (08.00–13.00 WIB) to optimally accommodate patient needs.

Figure 2. Klinik Harmoni Fisioterapi Clinic Services

Source: Process by Author

Klinik Harmoni Fisioterapi offers a comprehensive and structured service package, with efficient and clear therapy durations. Most standard therapy services, from Basic Scoliosis

Exercises and Electrical Stimulation to Infrared Radiation, to TENS and Ultrasonic Therapy, are designed to last 15 to 20 minutes per session. We also offer comprehensive treatment packages such as robotics and hydrotherapy, which require longer sessions of 30 to 40 minutes. We also provide a 15 to 20-minute doctor's consultation for diagnosis and evaluation.

Table 2. Physiotherapy Service Package

Package category	Patient condition	Action	Tools used	Duration	visit
Serious pain therapy package					
a. Post-stroke package	Total paralysis or partial paralysis of the limbs, difficulty swallowing, difficulty sleeping, and difficulty speaking.	• Robotic Physiotherapy • Stroke Exercise	• Tens • MWD • Robotic • Physiotherapist	• Robotics = 30-40 minutes • Stroke Exercise = 15-20 minutes	12
b. Post-serious accident nerve pack	Total or partial paralysis due to spinal cord trauma, difficulty moving, breathing, and headache attacks.	• Robotic Physiotherapy • Exercise/Massage	• Robotic • Physiotherapist • Cyro Diametric • MWD	• Robotics = 30-40 minutes • Stroke Exercise = 15-20 minutes • MWD = 15-20 minutes	12
c. Post-major surgery rehabilitation package	Difficulty moving or carrying out activities as usual, muscle function is not yet optimal, nerve function has not recovered.	• Massage Manipulation • Exercise	• Static Cycle • SWD • Cyro Diametric	• Massage = 15-20 minutes • Exercise = 15-20 minutes	12
Moderate pain therapy package					
a. Difficulty in moving vital muscles grows	Difficulty moving part of the body so that one cannot carry out normal activities without the help of another person, such as difficulty moving one leg or hand.	• Electrical Stimulation • Exercise	• Tens • NMES • Physiotherapy	• Electrical = 15-20 minutes • Exercise = 15-20 minutes	6-10
b. Spinal nerve problem package	Pain and difficulty moving the lower back, waist and hip areas.	• Hydrotherapy • TENS	• Hydrotherapy • Tens • MWD	• Hydro = 30-40 minutes • MWD =	6-10

Package category	Patient condition	Action	Tools used	Duration	visit
				15-20 minutes	
c. Post-operative muscle care package due to accident injury	Difficulty moving one of the body's muscles after surgery and/or a sports accident.	• Exercise • Ultrasonic Therapy	• Physiotherapy • Ultrasonic Therapy	• Exercise = • 15-20 minutes • Ultrasonic = 15-20 minutes	6-10
d. Scoliosis syndrome package	A condition of a curved spine.	• Massage Manipulation • Exercise	• Tens • NMES • Physiotherapy	• Massage = • 15-20 minutes • Exercise = • 15-20 minutes	10
Light therapy package					
a. Small body movement difficulty package	Difficulty moving fingers and toes.	Shortwave Diathermy	• SWD • Cyro Diathermy	• Shortwave Diathermy = 15-20 minutes	6
b. Package for nerve problems after a mild stroke	Difficulty speaking, facial muscle and nerve problems, difficulty swallowing, and difficulty sleeping.	• Massage • Ultrasonic Therapy	• Physiotherapy • Ultrasonic Therapy	• Exercise = 15-20 minutes • Ultrasonic = 15-20 minutes	6
c. Flu and asthma package	Patients with chronic flu and asthma allergies.	Infrared Radiation	Infrared Radiation	Infrared = 15-20 minutes	10
d. Sprains, muscle aches/pains, and tendons	The patient sprained his ankle while exercising or fell.	Electrical Stimulation	NMES	Electrical = 15-20 minutes	9

Source: Prepared by the Authors (2026).

Design Smart Clinic Application

Klinik Harmoni Fisioterapi optimizes customer satisfaction through alignment between medical quality standards and ease of service access, by implementing structured procedures from the reservation stage to therapy, as well as adopting Smart Clinic technology as an effective registration solution.

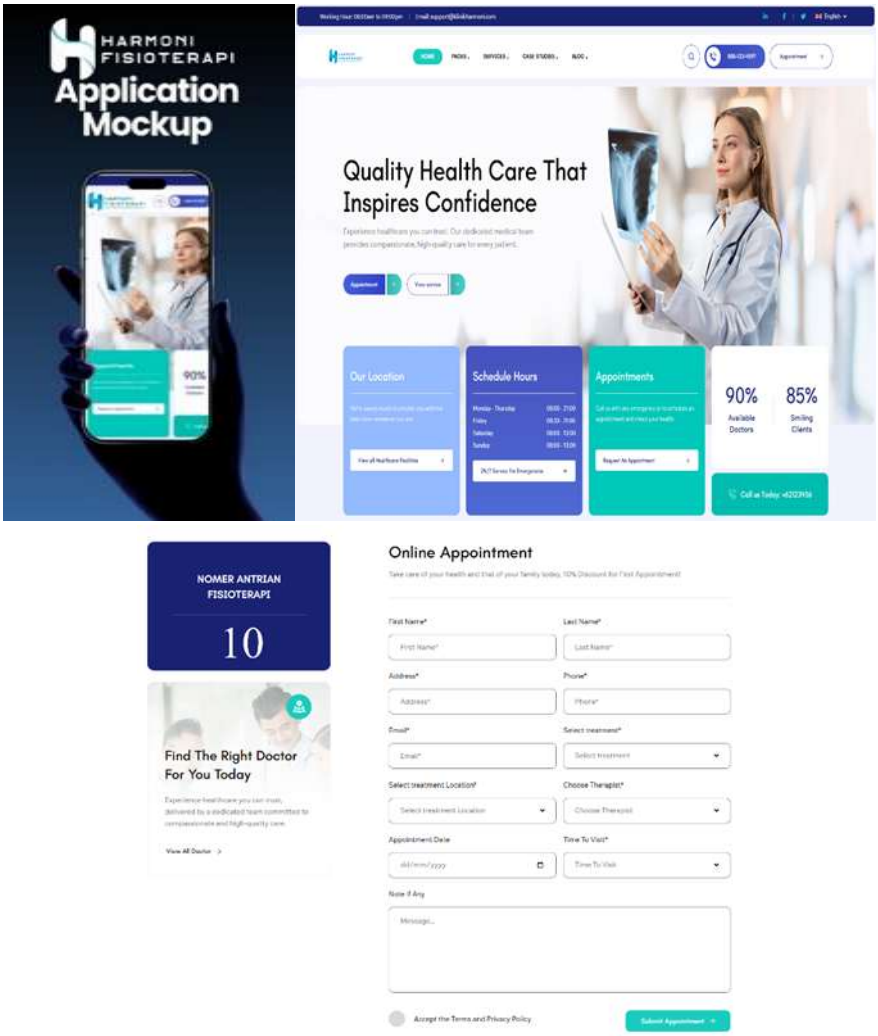

Figure 3
Klinik Harmoni Fisioterapi Application Mockup
Source: Process by Author

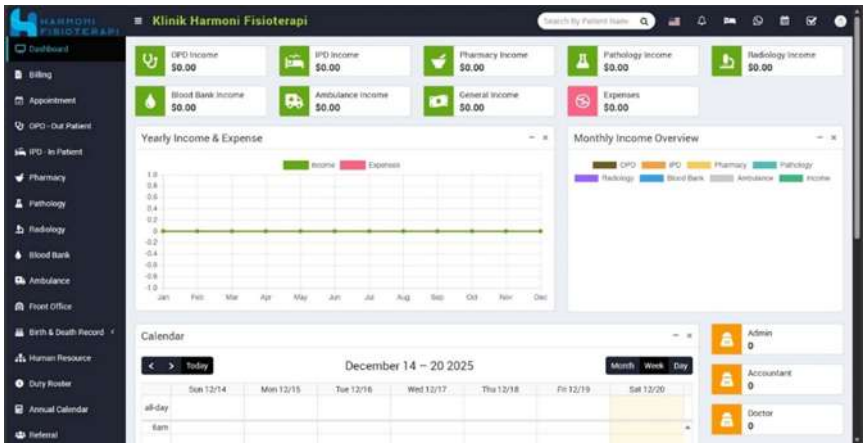

Figure 4
Klinik Harmoni Fisioterapi Backend Application
Source: Process by Author

Klinik Harmoni Fisioterapi Office Floor Plan

To provide an overview of the office layout, Harmoni Physiotherapy Clinic presents the following rough sketch which descriptively explains the three-story layout concept:

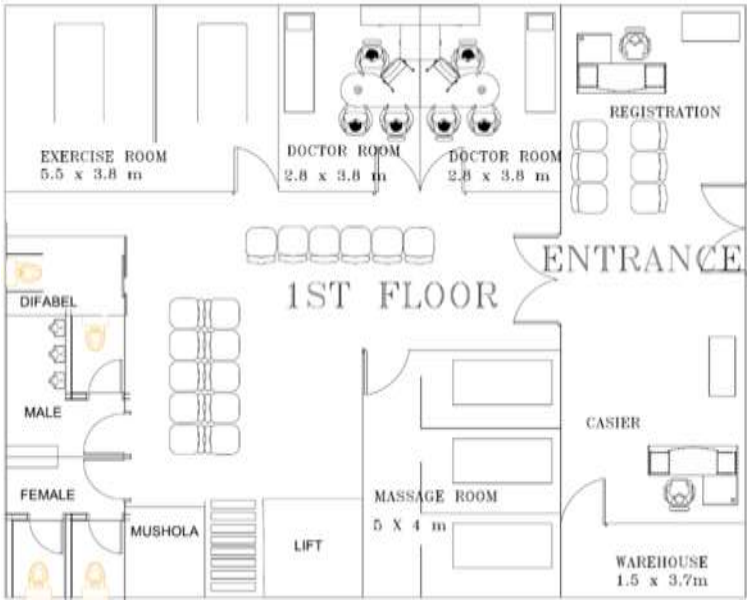

Figure 5
1st floor of the Klinik Harmoni Fisioterapi
Source: Process by Author

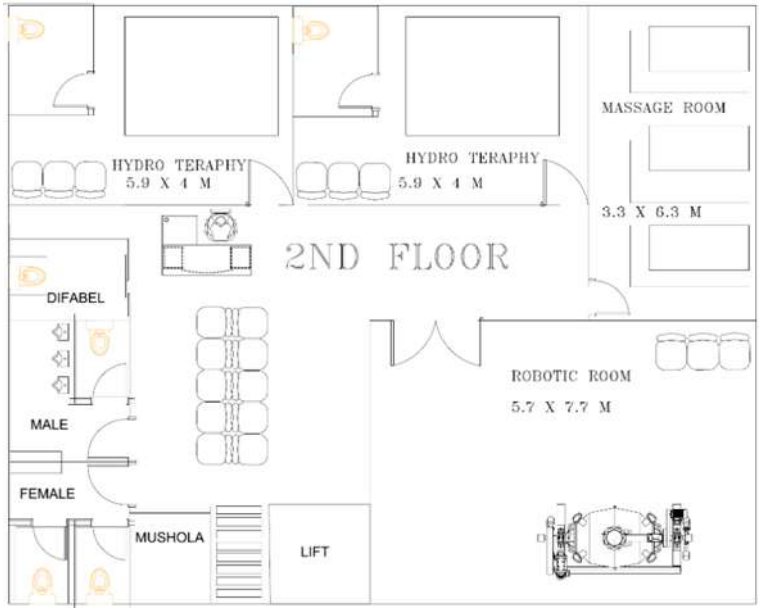

Figure 6
2nd floor of the Klinik Harmoni Fisioterapi
Source: Process by Author

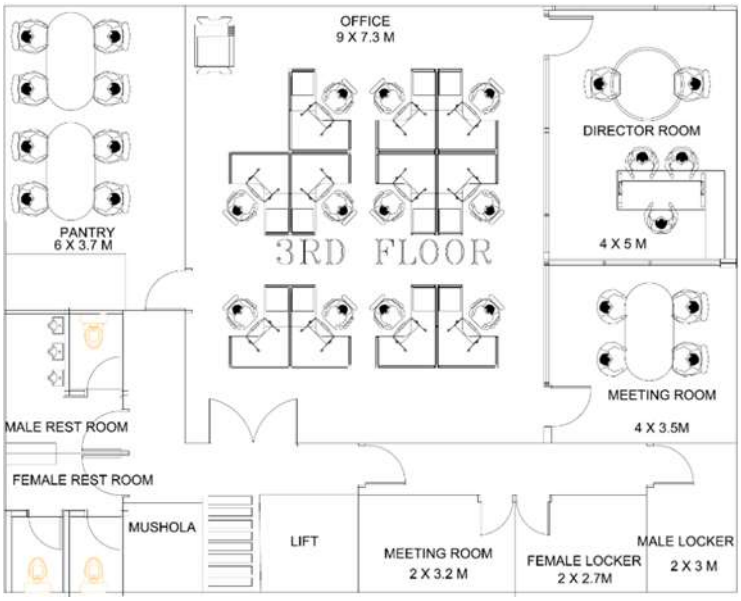

Figure 7
3rd floor of the Klinik Harmoni Fisioterapi
Source: Process by Author

This spatial architecture is designed to optimize service efficiency and support collaboration between teams. Patient comfort is also a key consideration in design.

1. **1st Floor Plan Concept**
   a. Floor plan of the first floor of the physiotherapy clinic, designed with an integrated spatial concept to support effective service and patient comfort. The main access to the clinic is from the entrance area, which is directly connected to the registration and cashier areas, allowing for efficient patient administration from the start of the visit.
   b. The central area of the floor serves as a patient waiting room, designed to accommodate patients prior to receiving medical services. The main service area includes two doctor's rooms measuring 2.8 x 3.8 meters for patient consultations and examinations, and a 5.5 x 3.8-meter exercise room for physical therapy. Additionally, a 5 x 4-meter massage room is available for manual physiotherapy.
   c. The clinic's supporting facilities include restrooms for men, women, and people with disabilities, a prayer room, an elevator, and a 1.5 x 3.7-meter warehouse for equipment storage. The overall layout is designed to create a systematic service flow, improve operational efficiency, and provide comfort and accessibility for all clinic users.
2. **2nd Floor Plan Concept**
   a. Floor plan of the 2nd floor of the Harmoni Physiotherapy Clinic, designed as an advanced therapy service area with a higher level of privacy and specialization. This floor plan focuses on providing technology-based therapy facilities and specialized care.
   b. On the left and center sides of the plan, there are two hydrotherapy rooms, each measuring 5.9 x 4 meters, used for water therapy. Each room is equipped with an internal waiting area to support patient comfort before and after therapy. The placement

of these rooms considers the need for easy access and the separation of wet therapy activities from other areas.

c. On the right side of the plan, there is a massage room measuring 3.3 x 6.3 meters used for advanced manual therapy. In addition, a robotic therapy room measuring 5.7 x 7.7 meters is provided, specifically designed for the use of robotic therapy equipment. This room has a larger area to accommodate devices, medical personnel, and patient movement safely and ergonomically.
d. Supporting facilities on the second floor include restrooms for men, women, and people with disabilities, a prayer room, an elevator, and stairs for vertical circulation. The central area serves as a waiting room, which serves as a transition zone between therapy rooms. Overall, the second-floor plan design reflects a clear division of functional zones, optimized circulation, and supports the integration of technology-based physiotherapy services within the clinic environment.

3. 3rd Plan Floor Concept

a. The image shows the third-floor plan of the Harmoni Physiotherapy Clinic, which is designed as an administrative and management area to support integrated clinical service operations and management. This floor focuses on non-clinical activities related to decision-making, internal coordination, and resource management.
b. The main area of the third floor is a 9 x 7.3-meter office space designed with an open office concept. This layout allows interaction and collaboration among administrative staff, as well as supporting efficient workflow and information exchange. This space serves as the center for operational data management, patient administration, and clinic information system management.
c. On the right side of the floor plan is a 4 x 5-meter director's room used for managerial activities and strategic decision-making. An adjacent meeting room, 4 x 3.5 meters, is used for internal coordination, performance evaluation, and operational planning. An additional 2 x 3.2-meter meeting room is provided for small-scale meetings or technical discussions.
d. Supporting facilities on this floor include a 6 x 3.7-meter pantry, male and female staff restrooms, a prayer room, and male and female lockers to support staff comfort and personal needs. Vertical access is provided via elevators and stairs, supporting efficient mobility between floors.
e. Overall, the third-floor plan design reflects a clear division of spatial functions between work areas, management, and support facilities, and supports the integration of the clinic's information system by providing a structured and efficient administrative workspace.

Physiotherapy Technology

Harmoni Physiotherapy Clinic's commitment to service precision is realized through strict medical asset management, particularly through regular calibration of physiotherapy equipment to ensure the accuracy of equipment function according to operational feasibility standards.

Table 3.

Physiotherapy Equipment Technology

Pictures	Equipment Name
	Tens 7000 TENS (Transcutaneous Electrical Nerve Stimulation) therapy is used to relieve pain by sending low-voltage electrical currents through electrodes attached to the skin.
	Nmes (Neuromuscular Electrical Stimulation) A therapy method that uses electrical impulses through electrodes attached to the skin to stimulate muscle contractions.
	Terapi Ultrasound A non-invasive medical procedure that uses high-frequency sound waves (>20,000 Hz) to relieve pain, accelerate tissue healing, and reduce muscle tension.
	Microwave Diathermy A physiotherapy method that uses microwaves to produce deep heat in body tissues such as muscles and joints.
	Shortwave Diathermy Physical therapy uses high-frequency electromagnetic energy to heat deep body tissues, reducing pain, inflammation, and improving blood circulation and tissue healing in conditions such as sprains, strains, frozen shoulder, and low back pain.
	Infrared Radiation Therapy A light-based therapy method that uses infrared radiation to penetrate body tissue, relax muscles, improve blood circulation, reduce pain and inflammation, and accelerate the healing of injuries.
	Static Cycle A rehabilitation and fitness method that uses a stationary bicycle to improve physical fitness, such as increasing lung capacity and muscle strength, and to help patients recover after a stroke.
	Cryo Diathermy Two different therapies: cryotherapy (cold therapy) and diathermy (heat therapy), which are often used in physiotherapy separately or combined to manage pain and injuries.

Pictures	Equipment Name
	Robotic Therapy A form of physical rehabilitation that uses robotic devices to help patients recover limb function (arms, legs, etc.) due to disorders such as stroke, nerve injury, or post-surgery.

Source: Prepared by the Authors (2026).

Quality Management

PT NJU's quality management involves a series of actions aimed at ensuring the quality of service and the company's overall processes. This encompasses not only service quality but also other aspects such as employee quality and the company's overall reputation in the eyes of consumers. This quality management is crucial for instilling quality awareness throughout PT NJU's processes and is carried out with a quality-centric approach. Quality management can also add value to a company and significantly impact customer loyalty.

Table 4. Quality Management PT Nuart Jidoka Utama

No	Activity	Activity Detail	Measurement
1	Internal Quality Control (IQC).	Testing positive and negative controls on each batch of tests.	Percentage of control results that meet standards (e.g., ≥95% of control results within the acceptable range).
2	Equipment Calibration and Maintenance	Routine instrument calibration	Calibration frequency according to manufacturer guidelines (e.g., every 6 months) and recorded in the maintenance log.
3	Staff Training and Competence	Routine staff training	Percentage of staff passing the annual competency test (e.g., ≥95% of staff passing the competency test).
4	Internal Audit and Performance Evaluation	Conducting routine audits for compliance with standard operating procedures (SOPs).	Number of non-conformance findings with SOPs per audit period (e.g., <5 findings per quarter).
5	Continuous Quality Improvement (CQI)	Hold monthly meetings to review audit results and identify areas for improvement. Use of appropriate personal protective equipment (PPE), such as gloves and masks.	Number of improvement initiatives implemented annually (e.g., ≥3 initiatives per year).
6	Occupational Safety and Security	Hold monthly meetings to review audit results and identify areas for improvement. Use of appropriate personal protective equipment (PPE), such as gloves and masks.	Compliance rate with PPE use (e.g., ≥98% compliance).

Source: Prepared by the Authors (2026).

Operational Cost Projection

The operational cost assumptions for the Harmoni Physiotherapy Clinic are based on a detailed analysis that directly links to strategic marketing planning. The projected operational budget not only serves as an estimate of routine expenses but is also oriented to support the implementation of the strategy, particularly in efforts to increase revenue and achieve long-term cost efficiency. Therefore, each cost component is assumed to align with established strategic marketing objectives.

Table 5. Pre-Operational and Operational Cost Projections

No	Description	Year I	Year II	Year III	Year IV	Year V
1	Building Renovation	-	-	-	262.500.000	275.000.000
2	Clinic permits (OSS, Dinkes, SIP, HO, IMB)	-	-	-	52.500.000	55.000.000
3	Systems & Technology	-	-	-	105.000.000	110.000.000
4	Electricity	92.295.540	96.910.317	101.755.833	194.051.373	286.346.913
5	Water	65.578.410	68.857.331	72.300.197	137.878.607	203.457.017
6	Telephone & Internet	21.859.470	22.952.444	24.100.066	45.959.536	67.819.006
7	IPKL	7.286.490	7.650.815	8.033.355	15.319.845	22.606.335
8	Printed Matter Office	17.001.810	17.851.901	18.744.496	35.746.306	52.748.116
9	Stationery & Office Supplies	12.144.150	12.751.358	13.388.925	25.533.075	37.677.225
10	Photocopy	3.500.000	3.675.000	3.858.750	7.358.750	10.858.750
11	Repair Maintenance Building	40.000.000	42.000.000	44.100.000	84.100.000	124.100.000
12	Repair Maintenance Equipment	50.000.000	52.500.000	55.125.000	105.125.000	155.125.000
13	Repair Maintenance Office Equipment	15.000.000	15.750.000	16.537.500	31.537.500	46.537.500
14	Rental Transportation	124.000.000	130.200.000	136.710.000	260.710.000	384.710.000
15	Permit & License	12.000.000	12.600.000	13.230.000	25.230.000	37.230.000
16	Linen	15.000.000	15.750.000	16.537.500	31.537.500	46.537.500
17	Non-medical Supplies	24.000.000	25.200.000	26.460.000	50.460.000	74.460.000
18	Material Cost	65.000.000	68.250.000	71.662.500	136.662.500	201.662.500
19	Transportation	16.700.000	17.535.000	18.411.750	35.111.750	51.811.750
20	Staf Meal	48.000.000	50.900.000	53.945.000	91.945.000	129.945.000
21	Incentive Dokter Specialist & Physiotherapist	61.000.000	63.550.000	66.227.500	137.227.500	208.227.500

Source: Prepared by the Authors (2026).

CONCLUSION

This study concludes that the operational planning system implemented at Klinik Harmoni Fisioterapi successfully demonstrates the importance of integrating digital technology, physiotherapy services, and operational management into a unified smart clinic framework. The integration of digital registration, electronic medical records, therapy scheduling, robotic physiotherapy, hydrotherapy, and quality management contributes significantly to improving operational efficiency, service consistency, patient satisfaction, and rehabilitation effectiveness. In addition, the clinic's operational design supports data-driven decision making, enhances coordination among healthcare personnel, and strengthens the quality of modern physiotherapy services. The findings indicate that technology-based operational planning can become a strategic approach for physiotherapy clinics in responding to the increasing demand for rehabilitation services in Indonesia. Despite these contributions, this research still has several limitations because it focuses on a single case study and uses a qualitative descriptive approach. Therefore, future research is recommended to conduct comparative studies involving multiple physiotherapy clinics or healthcare institutions to obtain broader generalization of findings. Further studies may also apply quantitative or mixed-method approaches to measure the direct impact of smart clinic systems on patient recovery outcomes, operational costs, service quality, and patient satisfaction. In addition, future researchers are encouraged to explore the implementation of artificial intelligence, telehealth systems, Internet of Things (IoT), and predictive analytics in physiotherapy services to support more adaptive, efficient, and personalized rehabilitation management systems.

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