# Combination Of HCD, Persona, MVP, and Thumb Zone for Designing TNI Physical Fitness Monitoring Application

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## Abstract

This research contributed to producing a combination of design methods and design of the Indonesian National Army (TNI) physical fitness monitoring application. This research is very important because TNI institutions really need a physical fitness monitoring application to be able to make the right decisions. The design of the physical fitness monitoring application primarily uses the Human-Centered Design (HCD) method which is then combined with the Persona, Minimum Viable Product (MVP) and The Thumb Zone methods. The combination of HCD with Persona has been proven to be used to understand and determine usage content and user needs. The combination of HCD with MVP has proven to be able to be used to produce design solutions to meet user needs. The combination of HCD with Thumb Zone has proven to be able to be used to evaluate designs against user needs. Finally, as many as 20 Persona respondents agreed that the combination of HCD, Persona, MVP, and Thumb Zone proved reliable for producing physical fitness monitoring application design solutions that can be used naturally and meet the needs of TNI.

## 1. Introduction

Physical fitness is the main factor in supporting the main unit tasks of Tentara Nasional Indonesia (TNI). So, maintaining physical fitness is a major obligation that must be carried out by every TNI. Efforts to maintain and improve the physical fitness of TNI are carried out through physical training and physical fitness tests. Physical training is carried out throughout the year and to find out the results of this physical training, physical fitness tests are carried out periodically. The physical fitness test is a requirement that must be met in assessing applications for promotion, selection of strategic positions, and applications for further education [1].

So far, every TNI reports his physical maintenance activities through an application that is not owned by the TNI. The application is considered to provide convenience and speed in collecting, monitoring, and evaluating reports on physical maintenance activities from TNI. This means that the existence of a fitness monitoring application is very important for TNI institutions. However, every TNI is asked to enter personal data and agree to access his personal data when installing the application. This results in personal data and even data on the physical fitness status of TNI being owned by other parties outside the TNI institution. Even though this data is important and confidential, it can reflect the TNI's defense strength.

Therefore, it is important to carry out research aimed at designing an application for monitoring the physical fitness of TNI. This research was conducted in the TNI environment using the Human-Centered Design (HCD) method. Meanwhile, the HCD was chosen because it has been widely proven to accurately design applications according to user needs [2][3][4][5][6]. In this research, HCD is combined with the Persona, Minimum Viable Product (MVP), and the Thumb Zone methods. The combination of HCD with the Persona method is needed to understand and determine user content and needs [7][8][9][10]. The combination with the MVP method is needed to produce design solutions to meet user needs[11][12][13]. The combination with the Thumb Zone method is needed to evaluate the design against user needs [14][15]. Finally, the research contributes to solving the problems and needs of designing a valid TNI fitness monitoring application for the benefit of future application design research.

## 2. Research Method

### 2.1 HCD

Figure 1 explains the design of the Indonesian National Army's fitness monitoring application based on the ISO 9241-210:2019 HCD method. HCD is a method for producing designs that focus on user needs, habits, and capabilities.

HCD involves and positions the user as the design reference center from the beginning of the process. In this research, HCD is combined by the Persona, MVP, and The Thumb Zone Scale.
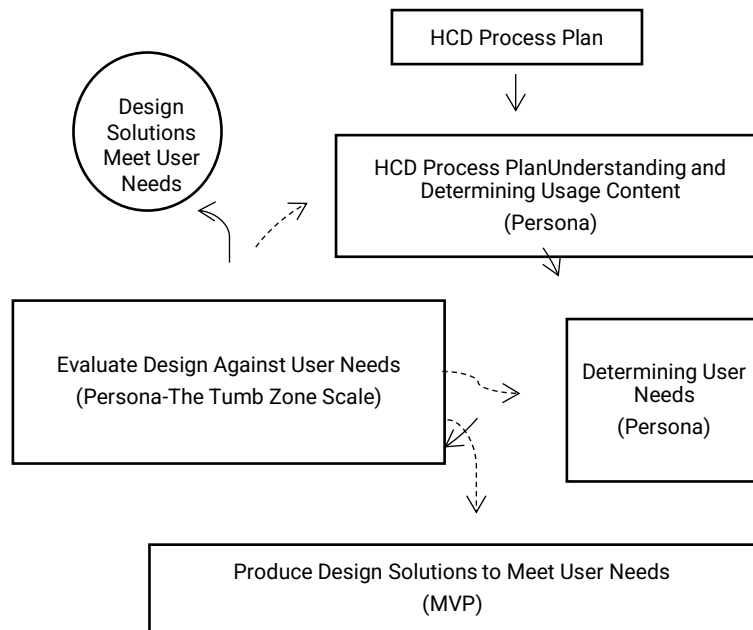


Figure 1. Application of persona, minimum viable product (MVP), and the thumb zone scale research methods based on ISO 9241-210:2019 human-centered design (HCD)

## 2.2 Persona

In this research, the Persona method is the initial spearhead of HCD. Personal is used to truly understand and determine the content of use and to determine user needs. Therefore, the Persona in this research is a TNI person who has expertise in the health sector. Based on the purposive sampling method, this research uses user personas from TNI health corp who is on assignment to study at ITSK SOEPRAOEN. The personas are considered as experts who can represent application design needs because they are in accordance with the field of education and its units [1]. The Persona results of the research sample are shown in Table 1.

Tabel 1. Persona

| Persona | Goals (PG) |
|---|---|
| TNI health corp of ITSK SOEPRAOEN | PG.1 View the physical performance score report |
| | PG. 2 Report physical performance scores |
| | PG. 3 View physical performance graphs |

## 2.3 Minimum Viable Product (MVP)

Next, the application design is created using the MVP method. The MVP method focuses on designing the main features of the Persona. The features created in MVP are PG-1: physical performance value display form, shown by displaying a history list of physical performance value reports containing type of sport, achievement, time, blood pressure and body weight. PG-2: physical performance value input form is shown by the pop-up display of the "Add Report" form. and PG-3: physical performance history graphic display form is shown by displaying a graph of achievements/day for the type of sport. The application design using MVP is shown in Figure 2.
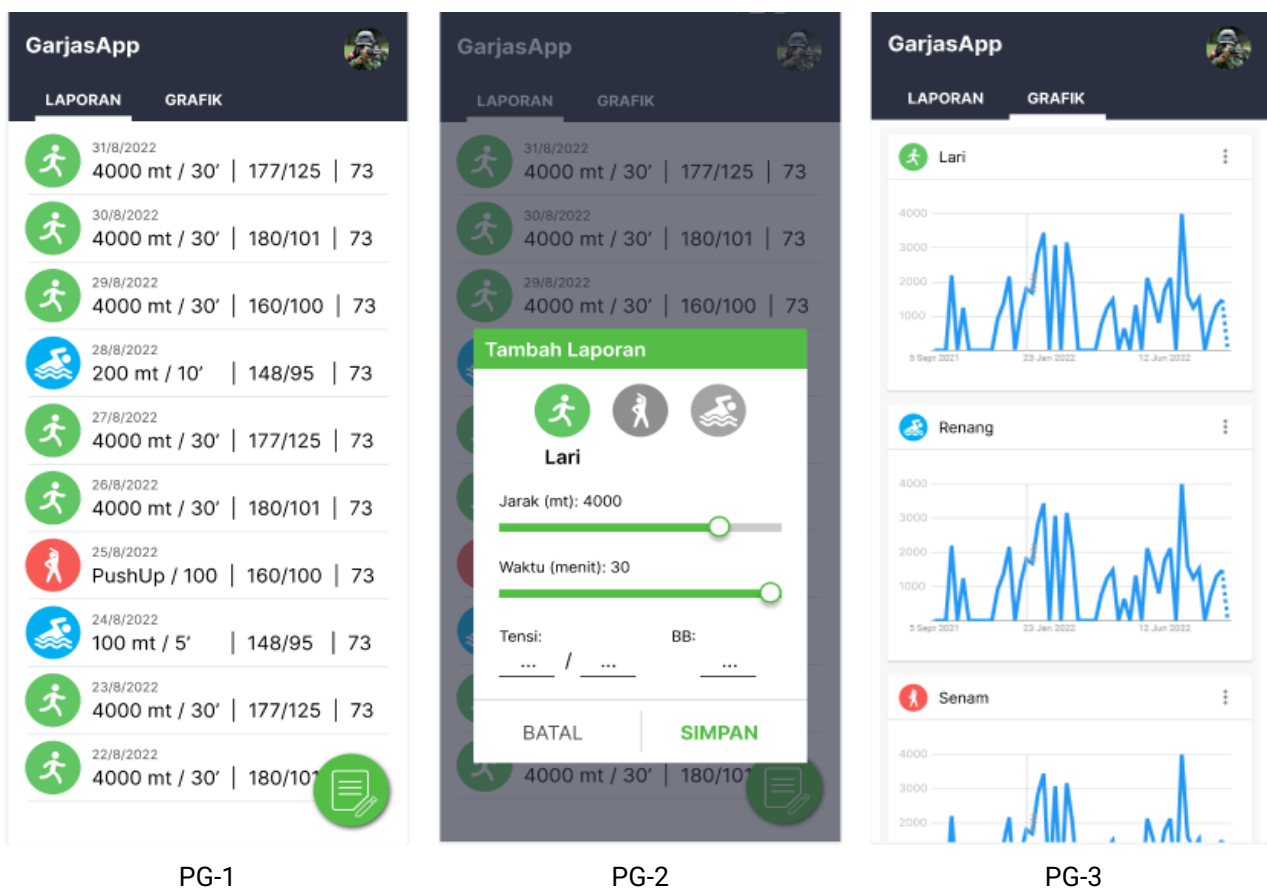
PG-1        PG-2        PG-3

Figure 2. Minimum viable product (MVP)

## 2.4 The Thumb Zone Scale

The Thumb Zone Scale method aims to test the user's ease of operating the application to meet the Persona's goals. The Thumb Zone Scale method is used to explore the experience when users use MPV. The stages of the contextual inquiry method in this research are that the user carries out the PG-1, PG-2, and PG-3 test scenarios first, then ends with observation. Observations were carried out using a questionnaire designed to validate whether the designed MPV made it easy to achieve the Persona's goals on a natural, stretching, or hard scale. The test scenario of The Thumb Zone Scale is shown in Table 2.
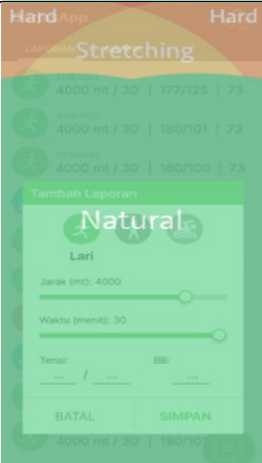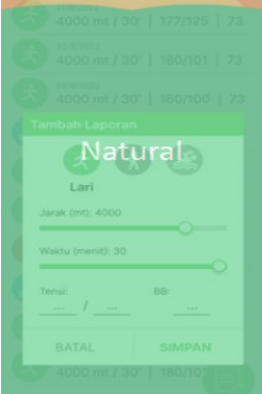
Tabel 2. Test scenario
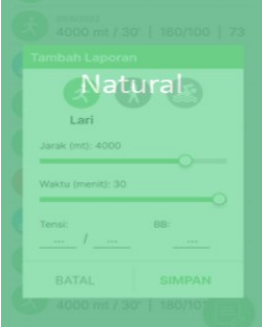
| Goals | Test Scenario |
|---|---|
| PG-1 | PG-1.1 Report tab slide |
| | PG-1.2 Scroll report history data |
| PG-2 | PG-2.1 Click the add report button |
| | PG-2.2 Select the sport type button |
| | PG-2.3 Input values in the sports field |
| | PG-2.4 Input a value in the tension field |
| | PG-2.5 Input a value in the weight field |
| | PG-2.6 Click the save button |
| PG-3 | PG-3.1 Slide chart tab |
| | PG-3.2 Scroll chart type |

## 3. Results and Discussion

Table 4 shows the test scenarios that have been implemented within 20 Persona of TNI health corp of ITSK SOEPRAOEN. Several Personas have carried out test scenarios and filling out questionnaires. Table 4 shows the thumb interaction on PG-1.1 – PG-1.2 is within the green radius or natural movement. In the PG-2.1 – PG-2.6 thumb interaction,

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it is in the green radius or natural movement. The PG-3.1 – PG-3.2 thumb interaction is also found in the green radius or natural movement. Finally, it can be concluded that the MPV designed is in accordance with the goals of the Persona.

Tabel 4. The thumb zone scale

| Goals | Scenario Tes | Preview | The Thumb Zone Scale | | |
|-------|--------------|---------|---------|-----------|------|
| | | | Natural | Streching | Hard |
| PG-1 | PG-1.1 |  | 20 | - | - |
| | PG-1.2 | | 20 | - | - |
| PG-2 | PG-2.1 |  | 20 | - | - |
| | PG-2.2 | | 20 | - | - |
| | PG-2.3 | | 20 | - | - |
| | PG-2.4 | | 20 | - | - |
| | PG-2.5 | | 20 | - | - |
| | PG-2.6 | | 20 | - | - |
| PG-3 | PG-3.1 |  | 20 | - | - |
| | PG-3.2 | | 20 | - | - |

## 4. Conslusion

This research contributed to producing two products, namely 1) A combination of HCD, Persona, MVP and Thumb Zone methods which can be relied upon to produce design solutions; and 2) Design of TNI physical fitness monitoring application. The success of the combination of the HCD, Persona, MVP and Thumb Zone methods was proven by 20 respondents agreeing that the physical fitness monitoring application design could be used naturally and had met the needs of the TNI Persona. Our suggestion is that for future application development research, expert validation should be carried out first.

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