



A Combination of Algorithmic to Predict Readiness for Change of Narcotics Addicts Rehabilitation Patients

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Abstract

This study aims to provide new tools for administering assessment tests regarding URICA-Scale, which initially used the paper based test method, and the calculations were calculated manually. In this study, two algorithms were applied. The Fisher-Yates algorithm performs random permutations that each user can give. It can generate random visualizations and minimize the

occurrence of fraud in the process. Then the Simple Additive Weighting (SAW) algorithm plays a role in calculating the calculations that have been selected by the user when making answer choices. In measuring changes in each drug addict there are several self-report questionnaire scales and algorithms that are applied to obtain achievable results. This paper provides an implementation of a system design in measuring the results of a questionnaire that has been supported by the combination of the Fisher Yates algorithm and the Simple Additive (SAW) in the University of Rhode Island (URICA) Change Assessment Scale for psychometric properties investigations. This algorithm can accommodate the output results in accordance with paper based test calculations, so that this system can provide a faster calculation process and minimize until there is an error in the calculation.

Keywords: Software; Simple Additive Weighting Algorithm; Fisher-Yates Algorithm; URICA-Scale

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Introduction

Advances in communication and technology grow rapidly in the globalization era. They enable people to do a lot of tasks very easily (Setyawan, 2017) (Aeni, 2021) (Afriani, 2020). A computer, for example, can speed up difficult calculation processes and assist someone in completing a variety of mathematical computations. The computer can guide psychologist and counselor in a coaching effort to help the addicted in a social rehabilitation process in diverse circumstances (Aguiar A. C., 2021) (Aguiar A. C., 2020). To accomplish the degree of termination of drug consumption, of course, the addict does not return to using the illicit commodities. The failure of drug addiction rehabilitation is a result of the numerous situations that drug users encounter, including feeling ashamed of being shunned, isolated, and even not being taken into consideration by the family since the family feels ashamed to have a family member who uses drugs. People who react shyly have higher levels of self-care, helplessness, and low self-esteem (Yunitasari, 2018).

Narcotics cases in Indonesia according to data collected from the Drug Information System (SIN) application, the number of narcotics cases successfully uncovered per year from 2012 to 2016 was 76.53%. The highest increase was 161.22% from 2013 to 2014, and in 2016, the number of successfully disclosed narcotics cases was 868, an increase of 36.05% from 2015 (Aeni, 2021). The high rate of drug abuse is one of the government's challenges in eradicating drugs, so it must be addressed as part of an effort to help an addict break free from addiction. Counseling is one method of increasing the desire or motivation to quit drug addiction. Counseling offers encouragement and motivation to make changes in oneself through the counseling process, which includes individual counseling and counseling groups (Aeni, 2021).

In the medical area, there are a variety of narcotics and psychotropic medications that, when taken correctly and with a doctor's approval, can be quite beneficial. When the term "drugs" is used, there are some hazardous compounds or drugs that are more dangerous. known to be readily sold and have a tendency to harm human health. A doctor's surgery must be preceded by an anesthetic. Doctors provide psychiatric medications to patients to help them recover from stress and mental problems. The field of medicine can benefit greatly from a wide variety of medications. As a result, the anti-drug stance is completely incorrect; in reality, it promotes drug abuse (Ramadani, 2021). In Indonesia, there are two types of rehabilitation: medical rehabilitation, which offers an integrated treatment to free drug users from drug dependence, and social rehabilitation, which promotes physical, mental, and social recovery for drug users so that former drug users can resume their social roles in society (Ramadani, 2021).

One way to assess a patient's readiness for treatment is to provide a test and compare the findings to the URICA Scale to determine if the patient is ready before or after rehabilitation (Krampe, 2017) (Mander, 2017). In general, the exam is still administered paper based testly, and in addition to getting the results, all test participants must still submit adjustments and calculations individually and paper based testly (Nurhayati, 2021) (Polaschek, 2010). The



findings of the assessment are received following the assessment test process, and the progress of an addict going through rehabilitation is assessed (Polaschek, 2010) (Yunitasari, 2018).

A patient can be measured during the rehabilitation process using a reliable reference to obtain data that can be entered into the priority scale after the patient has taken the exam (Krampe, 2017) (Mander, 2017). In general, determining measurements using the URICA-Scale reference is applied to individuals undergoing narcotics rehabilitation as well for a variety of reasons (Polaschek, 2010) (Yunitasari, 2018).

According to the United Nations Office of Drugs and Crime (ONODC), a group that focuses on drug issues, at least 271 million children between the ages of 15 and 6 (5.5 of the world's population) take drugs globally. illicit drugs Before 2019 (Ramadani, 2021) (Rachman, 2016) Drug misuse events both locally and globally came to the attention of world leaders, including Indonesia, where the country's president proclaimed a drug emergency five years ago (Ramadani, 2021) (Indonesia Patent No. Nomor 4 Tahun 2020, 2020).

The Fisher-Yates algorithm is often regarded as superior. a process for producing random combinations from a finite set. In 1938, the Fisher-Yates algorithm was originally suggested. reviewed in 1948 and presented in several modern iterations. Wilson published an algorithm in 2004, it was given the name "Santoro's Algorithm." Fisher-Yates Algorithm statistical analysis, shuffle validation time with the use of the frequency analysis from Interesting velocity analysis. Fisher-Yates Shuffle algorithm generic list object data structure and new style Random cards are generated using a tuning algorithm in the Net Framework for an online simulation game. This approach is used in another application to randomly select questions from computer-based assessments, ensuring that the questions you see are unique and can be generated without repetition or duplication (Hasan, 2017). A random permutation of a finite set is called a Fisher-Yates randomization (after Ronald Fisher and Frank Yates). This randomization technique produces outcomes with the same amount of probability. These factors led to the combination of the Fisher-Yates algorithm in this study, which produces a very good execution speed and a generated random strategy that complies with numerical randomization (Febriani, 2021). (V. Hegde, 2018). Previous studies have demonstrated that, in terms of randomization method and execution speed, the Fisher-Yates algorithm is superior to the nave shuffle technique (V. Hegde, 2018) (Febriani, 2021). Previous research concluded that the Fisher Yates Shuffle algorithm allows for the occurrence of similarity in random permutations to be very small, reaching 3.17% for the questions that arise, allowing these results to reduce the level of cheating in the test (Nurhayati, 2021).

It is necessary to have a system that can provide accurate calculation results, the system can accommodate structured data recording, and the system can be accessed anywhere and anytime. The situation in the field is that there is an application in conducting tests for narcotics rehabilitation addicts who are still using paper based test tests and the work requires ineffective results calculation time. The goal of this study is to create a prototype of a system that can calculate test results accurately using the URICA-Scale reference, allowing the rehabilitation



patient counselor to work more productively and with fewer calculation errors. The technique used to determine the weighting of the responses for each question point is based on SAW, but it has been modified such that the URICA Scale reference can be entered to provide the necessary outcomes. The Fisher-Yates algorithm can be used to obtain random permutations of all questions, which will then be displayed on the user side.

This study offers a method for executing the evaluation test that was initially administered paper based testly. Even though multiple people are working on it, fraud frequently happens during the test's execution, causing the findings to be subpar or even to generate the same output (Ardiansah, 2018) (Aridhona, 2017). In addition to applying two algorithms to enable the attainment of the output results produced to accommodate output results of the same value as paper based test calculations, this research can offer new methods for resolving one of these issues (Zencke Da Silva, 2019) (Green, 2017). Combining the two algorithms in the developed system is very helpful for carrying out the calculation process and makes the calculation process more effective and efficient. In addition, it can be an effort to make it easier for someone to perform who is involved in the assessment process implementation.

The implementations of URICA-Scale on certain items are explained in Part 2 utilizing programs in its computations in related domains. Some of these implementations are still traditional or do not yet exist. Following that, part 3 describes how to use the waterfall approach to implement system development. The Fisher-Yates method and Simple Additive Weighting (SAW) are examined and discussed in Section 4. Results of system development and recommendations for future system development are provided in Section 5 as a conclusion.

Methods

Several models can be used to design systems using the System Development Life Cycle (SDLC) approach, which is a part of the software development cycle. There are various steps from the beginning of the research when constructing the software in this study using the waterfall approach. as far as managing software (Sommerville, 2011) (Tambling, 2019), as demonstrated in Figure 1 below:

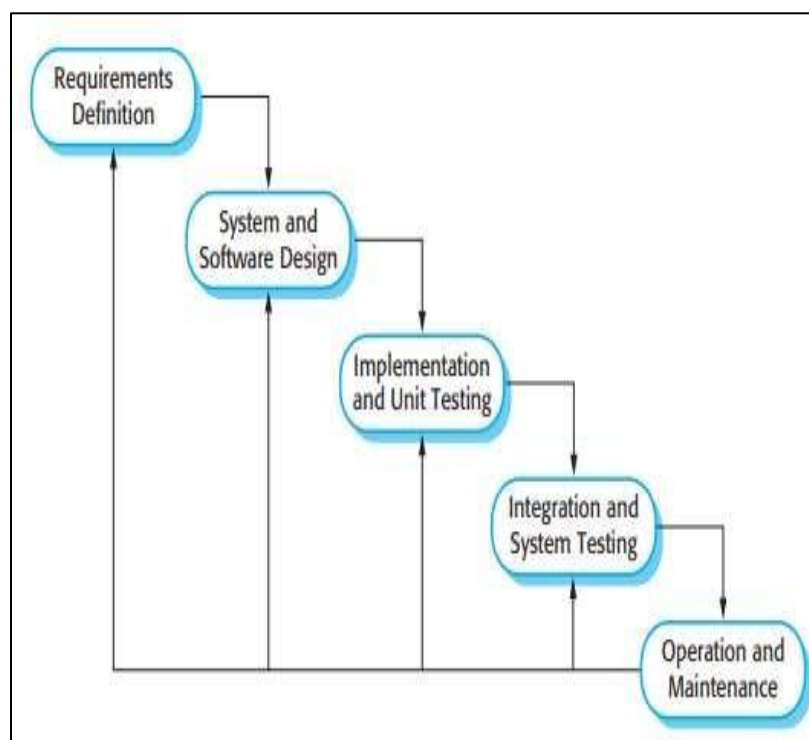


Figure 1. Model Waterfall (Sommerville, 2011)

An algorithm is fundamentally a procedure or group of guidelines that computations and other problem-solving activities, especially those performed by computers, must adhere to. In other words, all logical configurations are sorted using a certain system and then applied to solve issues. When a system is implemented, basic types of instructions known as algorithms are coded into a form (Hasan, 2017). The algorithm is meant to be implemented as a computer program, as is common in many circles. Asset liability management, stock trading, and loan pricing are a few examples of how algorithms are used in financial institutions.

Because computer programs are used to purchase and sell assets at a rate that is faster than human ability, the employment of algorithms in the trading industry is known as automated trading. When the data is processed by the algorithm, it will be shown in a variety of online formats, providing very precise access to the values of stocks, bonds, and commodities (Hasan, 2017). Figure 3 consists of 5 stages that are interrelated from one stage to another, which are as follows:

REQUIREMENT

The first step in creating research software is to analyze the need for field research, which includes visiting actual research sites and looking for literature on the connection between



problem gaps and analysis gaps that appear, specifically the emergence of traditional questionnaires and assessment fraud. Another issue arose when calculating at that time because it was still done manually, making the assessment process less than ideal. Therefore, it is truly necessary to go out several assessment processes to create software that can offer answers to arising issues. The software created models for the URICA assessment by using a web-based programming language to code the entire application and a MySQL database for data storage. Each question's scale is first translated into Indonesian to make it simpler for the user to complete the assessment.

SYSTEM and SOFTWARE DESIGN

Figure 2 illustrates how the system design is visualized during the design stage. Three mechanism procedures will be included in the system that is being created. Once the user has completed the assessment test, the results will be saved in the database and only the admin will have direct access to them. Additionally, the admin will have complete control over the user's account and have access to more features.

Users can add accounts right from the admin page, and admin-owned features are where users can view the consequences of their efforts. The administrator can also view the user's previous work. The output of this study is a table that succinctly summarizes the outcomes of the evaluation process. The URICA-scale reference places the user inside one of the stages.

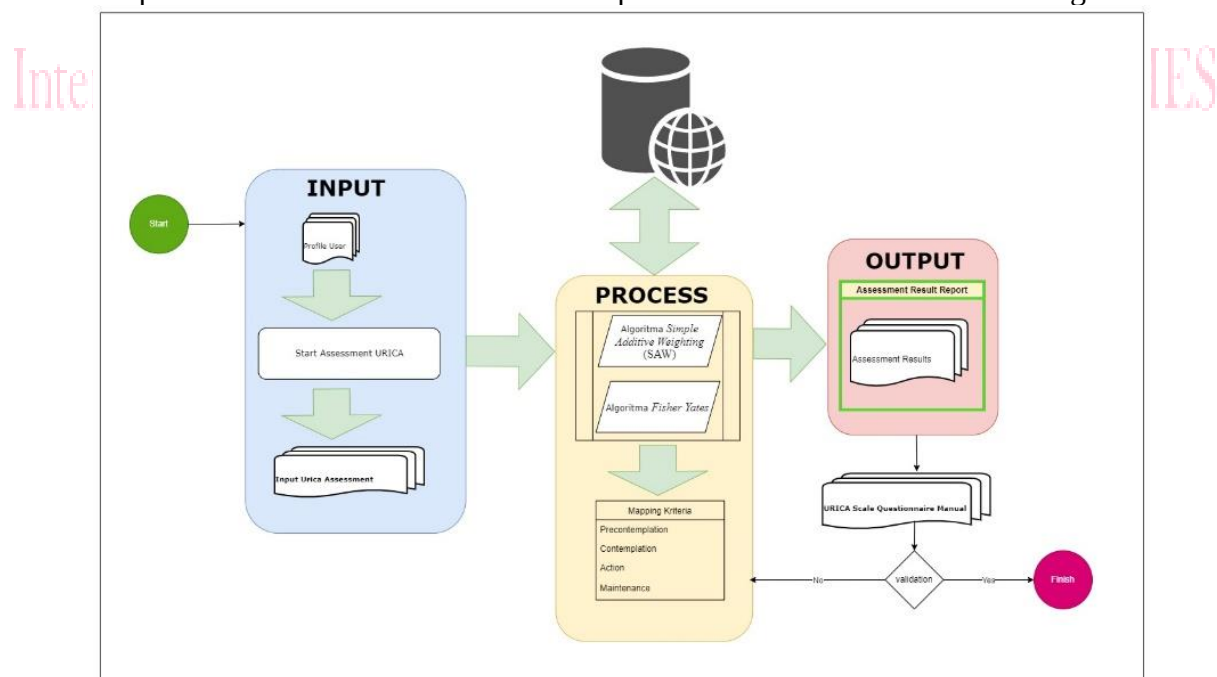


Figure 2. flow system purpose

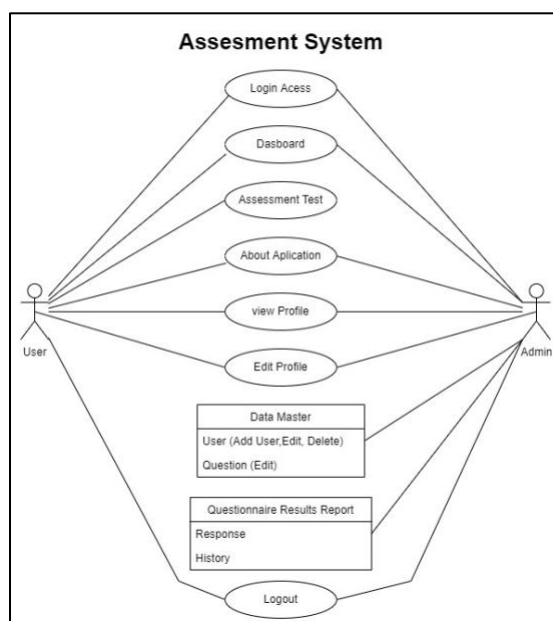


Figure 3 *Use-case diagram*

IMPLEMENTATION

The beginning of the programming activity stage is the third phase. To make it simpler to group command functions while coding, this research employs a web programming language to support a system that has been built as needed. Code Igniter will be used to implement the system. At this point, the Fisher-Yates and SAW algorithms are put into practice. The user will see a randomly generated question and have the chance to select from one of the five possible answers. The SAW algorithm will balance each response provided by the user after they have completed the entire assessment, and the calculation will use the URICA-Scale reference to provide the desired results.

TESTING SYSTEM

This is accomplished during the system testing step by executing the software and checking for ongoing faults. The report results will then be compared with paper based test calculations, whether or not they use the URICA-Scale calculation rules, once the validation test is complete, as illustrated in Figure 3.

OPERATION and MAINTENANCE

The maintenance phase checks for problems that were missed during the preceding phase and makes adjustments to satisfy evolving requirements for software development.



MEASURE URICA-SCALE

In earlier research, the URICA-Scale reference was utilized to gauge a patient's preparedness for therapy (Aguiar A. C., 2021) (Aguiar A. C., 2020) (Yakimuk, 2019). To assist drug users who want to stop taking drugs, it is important to comprehend the decision-making process. Drug abusers must through a lengthy but manageable process of recovery. Even after abstaining from drugs for a long time, a drug addict may go through a relapse phase or use them again. (Afriani, 2020) claims that the key factor in being able to stop using drugs is intention.

The URICA Scale reference can be used with patients who are not drug addicts and who are receiving treatment, such as those who are dystonic (Aguiar A. C., 2020) (Ardiansah, 2018), His research into the cycle of personal change uses audio to get outcomes. analyze your level of change preparedness and your preparation for change. This questionnaire is made in such a way that it uses the primary approach intended to produce each person's results based on cluster analysis to obtain quantifiable results. In addition, respondents are much more likely to favor questions from many stages. The URICA Scale is one of these instruments that has been psychometrically studied and used the most frequently in various contexts and groups. A summary score on the URICA Scale, which has 32 points, corresponds to the stages of pre-contemplation, contemplation, action, and maintenance.

A transtheoretical paradigm with five dimensions—pre-contemplation, contemplation, preparation, action, and maintenance—is employed in some additional investigations. People do not accept that they have a problem in the initial stage of pre-contemplation, and they do not think about changing the circumstances that lead to their problematic conduct. Contemplation is the stage of awareness of what is happening and consideration of the possibilities of changing oneself for the second dimension. However, those who reside in this second dimension have not committed to taking any action. The third dimension is in the "Action" stage, where individuals have taken the necessary actions to address their behavioral issues and have even interfered to alter their surroundings. At this stage, Action on Smoking Cessation would discontinue utilizing additives between one day and six months in prior studies using the same strategy. and the following dimension The treatment procedure culminates in maintenance, which can be seen as a process of consolidating behavior change and is anticipated to be able to counteract the effects of drug use (Polaschek, 2010)

Simple Additive Weighting

According to earlier studies, SAW takes a specific value prediction, and this algorithm can be utilized as decision assistance to accomplish specific aims (Jumaryadi, 2021), The accuracy findings from SAW are quite good, minimizing the possibility of implementation errors during the human computations used for validation (Hidayat, 2020) (Devi, 2015). Similar studies employ SAW The outcomes in predicting rainfall and water level cannot be said to be good and comprehensive in delivering outputs (Hannats Hanafi Ichsan, 2021) Additionally, the SAW algorithm can be used in conjunction with other algorithms to solve a problem or provide the



desired outcomes (Hannats Hanafi Ichsan, 2021) (Hasan, 2017). Other studies have combined techniques like SAW with other algorithms as a processing step; the comparison of these algorithms enables a more optimal match when choosing new hires in a company, and the outcomes demonstrate that SAW is superior and ideal (Setyawan, 2017) (Hidayat, 2020) on the other hand, SAW can also be implemented to provide recommendations for evaluating the selection of winners for asset procurement which is more objective because it can be weighted against predetermined criteria, in decision making in the evaluation process of alternative selection of winners for asset procurement, especially in the ranking process based on predetermined criteria (Nugraha, 2012), On the other hand, SAW may also be used to make suggestions for evaluating the selection of winners for asset procurement, which is more objective because it can be weighted against predetermined criteria. This is especially true in the ranking process based on predetermined criteria (Adiyono, 2022)

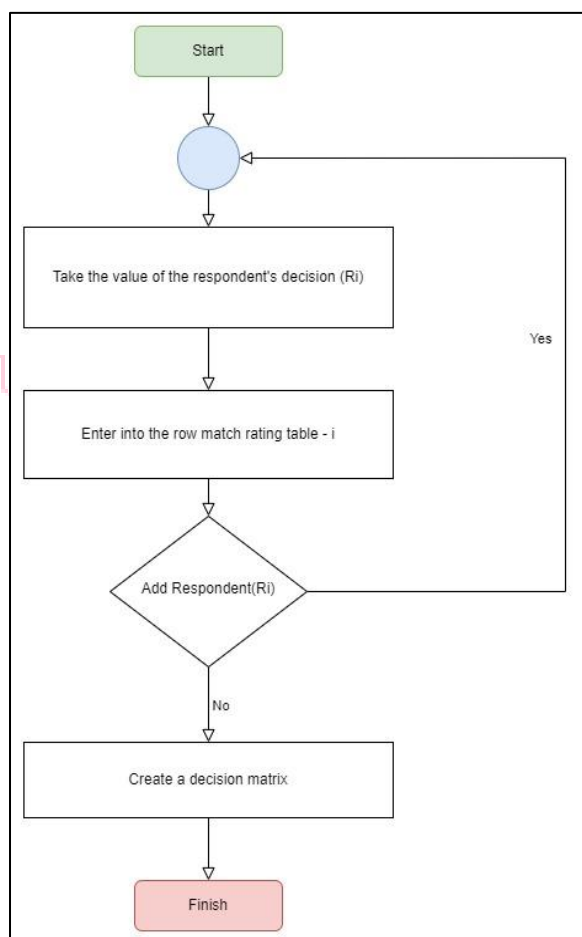


Figure 4. Matrix combination process flow (Adiyono, 2022)



To get dimensional results in line with the benchmarks on the URICA Scale, the SAW method was changed utilizing the URICA Scale reference as the basis for the weighting of the user's responses. The mathematical equations are shown as follows (Adiyono, 2022):

$$R_i, x_{PC(i)}, x_{C(i)}, x_{A(i)}, x_{M(i)} \quad (29)$$

$x_{PC(i)} = \text{Stage PreContemplation}$

$x_{C(i)} = \text{Stage Contemplation}$

$x_{A(i)} = \text{Stage Action}$

$x_{M(i)} = \text{Stage Maintenance}$

The following equation can be used to directly categorize respondents into one of the URICA Scale dimensions using the matrix calculation process that is created (Adiyono, 2022):

$$x_{PC(i) \text{ PreContemplation}} = \sum_{j=1}^7 q_{PC(i,j)} \quad (29)$$

$$x_{C(i) \text{ Contemplation}} = \sum_{j=1}^7 q_{C(i,j)} \quad (29)$$

$$x_{A(i) \text{ Action}} = \sum_{j=1}^7 q_{A(i,j)} \quad (29)$$

$$x_{M(i) \text{ Maintenance}} = \sum_{j=1}^7 q_{M(i,j)} \quad (29)$$

Fisher-Yates International Journal of Health, Education and Social (IJHES)

This technique may generate permutations of randomization and random visualizations that can be displayed on the user layer (Ulfa, 2020). There is a 3.17% likelihood that questions will look similar when they are offered to users, according to predictions of the emergence of the identical question from one user to another. as you are preparing for the test (Nurhayati, 2021) (Polaschek, 2010). In keeping with earlier studies, the CBT system's randomization model with the Fisher-Yates algorithm was able to provide diverse outcomes even if it was accessible at the same time and within the same timeframe (Febriani, 2021) (Hasan, 2017). According to earlier research, the Fisher Yates algorithm may produce random permutations of a finite set. The approach is useful for generating random words in user inquiries (Hasan, 2017).

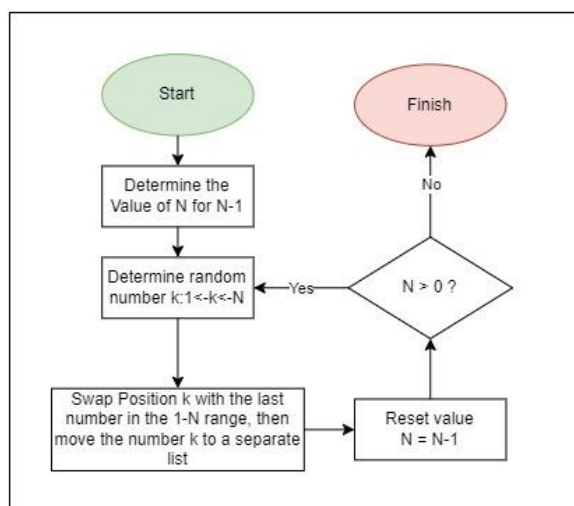


Figure 5. Fisher-Yates Randomization Method Flowchart (Hasan, 2017)

The risk of bias occurring during the permutation process can be reduced and the same value can be produced with the proper application of this technique. then this algorithm also contains a step where it can produce the following random permutations for QP questions 1 through 32:

1. List the questions from 1 to 32 in QP (According to the number of questions on the URICA Scale)
2. A random question between 1 and the quantity of QP that hasn't been shown is called "Choose K."
3. If the display of the QPs is done in a different order, the calculation that results from it will be worth K.
4. The loop continues via steps 2 and 3 until all QP are filled.
5. In step 3, the initial QP is randomly permuted.

SYSTEM MONITORING and SOFTWARE

The system is essentially a collection of interrelated, coordinated steps that are used to carry out an action or accomplish a specific objective (Safei, 2017). Monitoring is a sequence of activities used to keep an eye on how policies are being carried out, including how they relate to the outcomes or results they are expected to produce. Furthermore, according to (Safei, 2017), Monitoring is the process of gathering and analyzing data on activities or programs based on indicators that are put up consistently and methodically so that remedial actions can be performed to further improve the program or activity. Thus, it can be said that monitoring is a system or network that analyzes data based on specified indications and generates information feedback to take the necessary corrective steps to attain the desired goals (Safei, 2017). According to an earlier study (Rohman, 2020) (Safei, 2017) (Sahambangung, 2018), the system



has a specific vision and objective and is a continual activity within the company, either directly or indirectly.

Results and Discussion

When a user enters the system, several visualizations will emerge depending on the display results that were collected. The randomization of each question number that appears in Table 1 is described in the table that follows. On the respondent's data, which consists of 14 samples of data, the system that has been constructed successfully is tested for sample testing. The information gathered comes from assessments with established outcomes. In the questionnaire respondents data assessment is still done manually, as seen in the Figure 6. For this reason, it is necessary to design an application to be able to minimize errors in calculations and cause errors in determining the stage on the URICA-Scale, Figure 7 it can be seen that the results of the application that have been built can be more accurate and the calculation speed is more accurate.

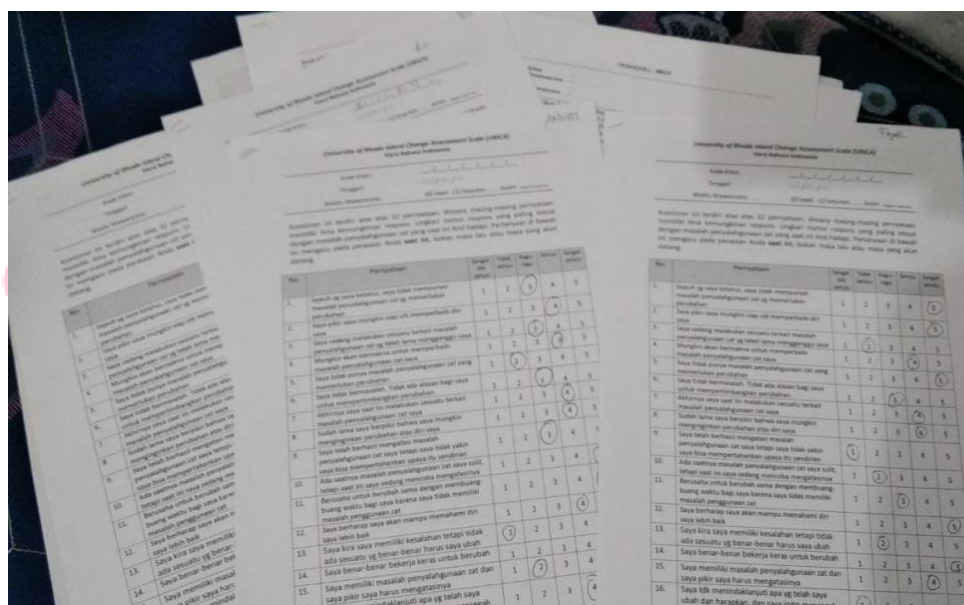


Figure 6. paper based test assessment results



Assesment System					
Administrator					
Laporan Hasil Kuesioner					
No.	Nama Lengkap	Wawancara	Tanggal	Group Avg	Group Stage
1	R1	1	2022-03-24	6.6	Precontemplation (PC)
2	R2	1	2022-03-24	9.6	Contemplation (C)
3	R3	1	2022-03-24	11.3	Action (A)
4	R4	1	2022-03-24	12.7	Maintenance (M)
5	R5	1	2022-03-24	9.0	Precontemplation (PC)
6	R6	1	2022-03-24	11.6	Action (A)
7	R7	1	2022-03-24	12.3	Action (A)
8	R8	1	2022-03-24	10.9	Contemplation (C)
9	R9	1	2022-03-24	9.9	Contemplation (C)
10	R10	1	2022-03-24	11.9	Action (A)
11	R11	1	2022-03-24	11.3	Action (A)
12	R12	1	2022-03-25	9.9	Contemplation (C)
13	R13	1	2022-03-25	11.0	Contemplation (C)
14	R14	1	2022-03-25	9.6	Contemplation (C)

Figure 7. System output

The comparison of paper based test assessment test data entered into the system yielded the results shown in Figure 6. The calculation process in the system is designed to be able to produce the same accuracy as the URICA-Scale reference, but it is quicker in terms of time to obtain these results when compared to paper based test calculations, especially if the assessment test is conducted with a relatively large number of respondents and at the same time. The results of the scores for each respondent were then grouped to create Figure 7, which is a graphic representation of the full respondent.

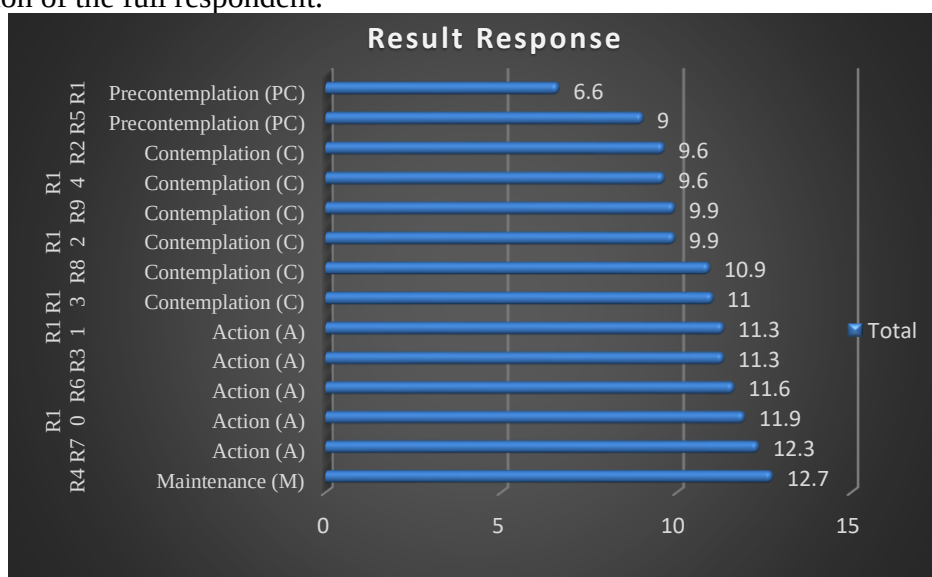


Figure 8. assessment test results



TABLE I. THE RESULT OF RANDOMIZATION OF QUESTION POINT

Question Point	User Access													
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
1	12	11	28	13	15	28	23	11	14	7	9	12	20	20
2	24	5	22	2	20	26	28	32	12	11	29	20	28	21
3	10	27	5	10	23	8	31	5	2	31	4	21	19	30
4	8	19	14	17	1	11	26	28	9	5	13	1	15	24
5	16	21	24	32	14	9	13	16	28	22	22	17	21	23
6	29	22	21	21	30	21	27	17	30	12	16	29	27	27
7	15	26	23	20	22	31	1	20	19	19	10	18	7	3
8	1	29	11	8	26	19	14	9	13	24	17	13	22	18
9	11	32	9	7	13	15	2	23	31	2	27	23	12	9
10	23	9	25	15	28	23	10	25	7	1	5	8	6	29
11	22	23	12	18	32	14	8	10	26	8	6	11	8	6
12	2	14	19	27	17	16	9	30	8	26	7	6	26	14
13	30	4	29	23	9	4	25	2	25	30	21	27	16	22
14	26	1	31	3	24	30	24	1	16	27	12	28	14	13
15	21	10	4	30	29	22	15	7	17	32	3	26	9	1
16	3	31	7	31	5	2	29	4	24	25	15	30	10	26
17	31	18	17	1	18	6	16	15	1	10	31	16	4	31
18	9	20	32	22	27	29	11	12	27	9	19	7	25	5
19	25	13	13	24	2	7	3	3	32	18	8	10	32	19
20	7	2	16	28	21	13	30	27	3	21	14	3	5	32
21	19	17	6	16	3	24	6	6	22	20	1	5	1	28
22	4	24	18	25	4	10	19	21	20	6	11	24	29	17
23	6	12	20	9	25	20	22	13	21	3	30	19	17	7
24	13	8	15	12	11	3	5	18	15	29	28	31	2	25
25	5	16	1	6	19	18	12	22	11	16	24	2	18	16
26	32	15	30	26	16	5	21	26	4	14	20	9	11	2
27	28	30	2	19	6	27	20	31	29	17	2	4	31	4
28	27	7	10	14	31	12	4	19	10	23	26	14	24	8
29	17	6	8	11	10	17	18	14	5	13	25	25	3	12
30	18	3	26	4	12	25	32	8	18	4	18	15	13	10
31	20	25	3	5	8	1	7	24	6	28	23	32	23	11
32	14	28	27	29	7	32	17	29	23	15	32	22	30	15

To put it simply, this study uses a four-stage procedure (input, process, validation, and output). Additionally, it is examined from both the admin and user perspectives in the system shown in Figures 9 and 10 on the admin side and user side, respectively.

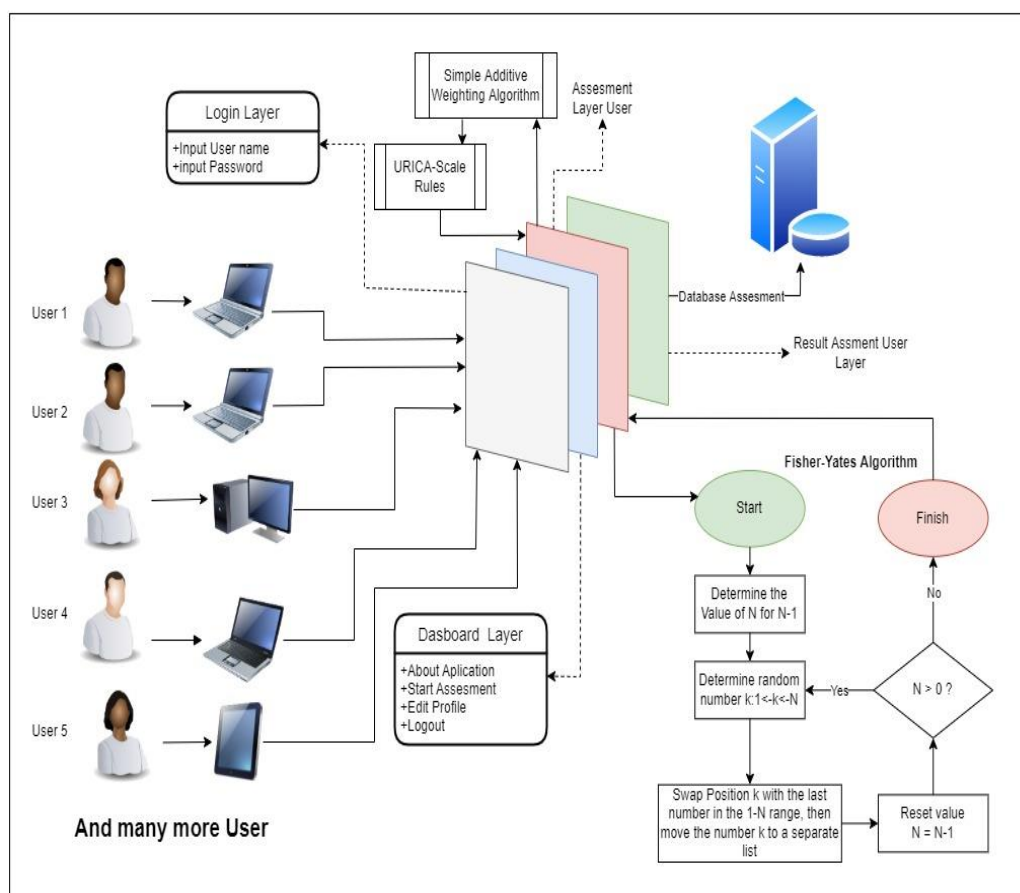


Figure 9. Layer System on the user side

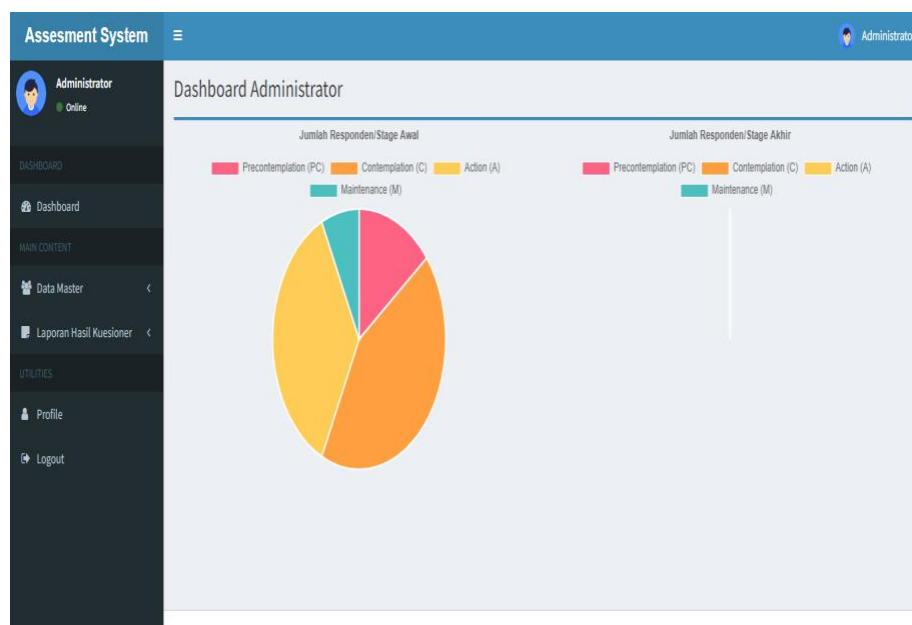


Figure 10. Dasboard layer Admin

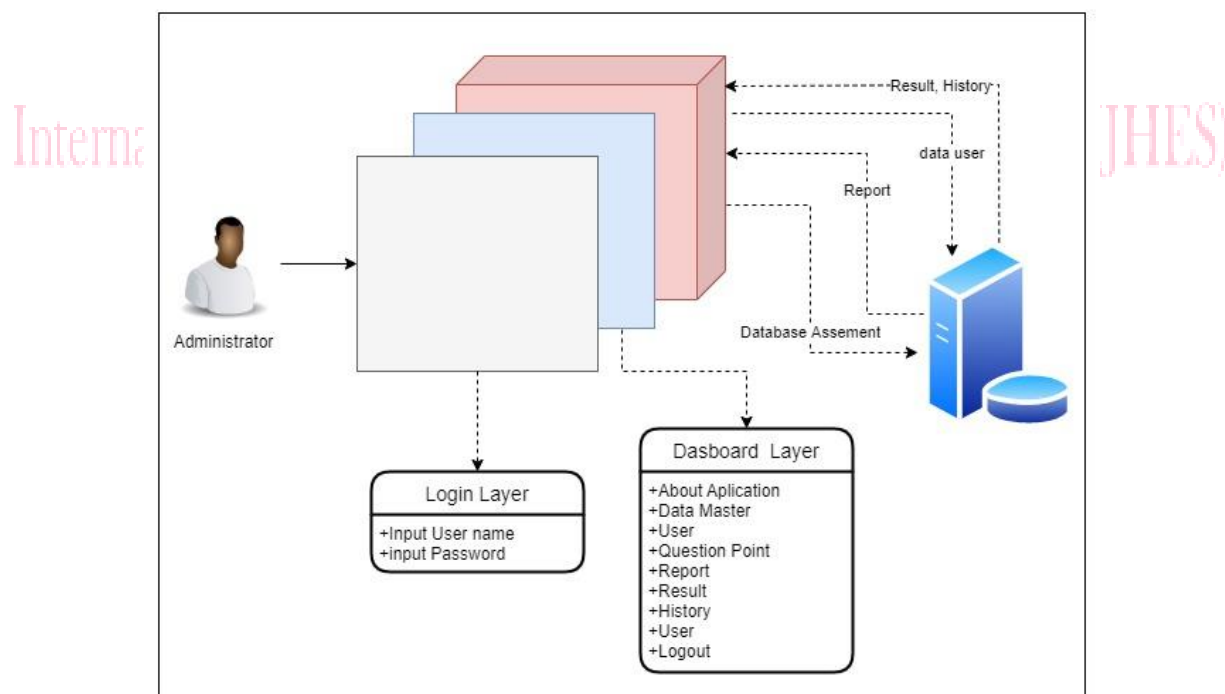


Figure 11. Layer System on Admin side



The user must answer 32 questions in the total URICA-Scale reference. The entire list of URICA-Scale questions is directly loaded into the database as a parameter reference for random visualization, as seen in Figure 5. Regarding the range of 1 to 5 potential responses. When the user has completed all of the questions, the evaluation's output will be divided into the following model dimensions: Pre-Contemplation (PC) Stage, Contemplation (C) Stage, Action (A) Stage, Maintenance (M) Stage. The four aforementioned characteristics refer to the Score Readiness for Change table in Table 1 while processing the user's calculation of the assessment replies (Setyawan, 2017) (Safei, 2017) (Sahambang, 2018).

TABLE II. VALUE READINESS FOR CHANGE

Totally disagree	Disagree	Do not know	Agree	Totally agree
1	2	3	4	5

The language employed in this software development research's implementation, the system commands, is Indonesian. 32 questions total, broken down into several grouping stages, are included in the requirements of each stage to allow for the following general assessment of the stages (Aeni, 2021) (Field, 2009) :

1. Stage Pre-Contemplation (PC) = 1, 5, 11, 13, 23, 26, 29
2. Stage Contemplation (C) = 2, 8, 12, 15, 19, 21, 24
3. Stage Action (A) = 3, 7, 10, 14, 17, 25, 30
4. Stage Maintenance (M) = 6, 16, 18, 22, 27, 28, 32

By supporting the Fisher-Yates technique to depict a separate display for each user's access, URICA-Scale, a reference that has been methodically created, can be used in computational calculations. Figure 6 displays a portion of the program that, when a user accesses it concurrently, causes the visualization to appear at random.

```

<?php
defined('BASEPATH') or exit('No direct script access allowed');

class Pengisian_model extends CI_model
{
    function fisher_yates_shuffle($arr) {
        for($i = count($arr) - 1; $i > 0; $i--) {
            $r = rand(0, $i);
            $tmp = $arr[$i];
            $arr[$i] = $arr[$r];
            $arr[$r] = $tmp;
        }
    }
}

```

Figure 12 Fisher-Yates algorithm part of coding script



In general, it was indicated in earlier studies that one of the finest strategies to eliminate value discrepancies and value ambiguity was obtained by utilizing the fuzzy logic process. Consequently, the output of this algorithm is regarded as maximal (Hannats Hanafi Ichsan, 2021). The algorithm is believed to have failed in its attempt to distribute the fair value across numerous outputs by correctly managing the door opening. SAW can therefore offer accurate weighting while processing the output (Hannats Hanafi Ichsan, 2021) (Hasan, 2017).

The study's software was used at the processing step of the system to facilitate calculations using the URICA-Scale reference mechanism. The weighted summation of the user's overall assessment questions was processed using the SAW algorithm. A portion of the script is shown in Figure 13. a tool that performs computations using the URICA-Scale rules

```
$this->pagging('kuesioner/kuesioner', $data);

if (!empty($this->input->post('submitted'))) {
    $jml_stage = [0.0,0.0,0.0,0.0,0.0];
    $avg_stage = [0.0,0.0,0.0,0.0,0.0];

    $respon = $this->input->post('respon');
    for($i = 0; $i<count($nomor); $i++) {
        if ($respon[$i] == 1) {
            $sts = 1;
            $ts = 0;
            $rr = 0;
            $s = 0;
            $ss = 0;
        } elseif ($respon[$i] == 2) {
            $sts = 0;
            $ts = 1;
            $rr = 0;
            $s = 0;
            $ss = 0;
        } elseif ($respon[$i] == 3) {
```

Figure 13 processing coding script

Conclusion and Recommendation

A prototype system that can help better in calculations when assessment tests using the URICA scale reference are implemented is the result of the studies that have been carried out. The implementation of the assessment of 14 respondent data produces the same output as the test conducted by comparing the results of traditional calculations, with the Pre-Contemplation (PC) stage of 14%, Contemplation (C) of 43%, Action (A) of 36%, and Maintenance (M) by 7%. The Fisher-Yates method can reduce cheating in scoring tests and offer less fluctuation in the results of randomization of questions. In addition, basically in the implementation of the test must consider the circumstances of each user. When the user completes the assessment test, the question items will be displayed randomly by the system, after the patient fills in all the answers,



the system with the SAW algorithm performs the same calculation with the URICA Scale reference. The hope from further research can be developed again into different platforms so that various application models can be developed.

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