DEVELOPMENT of THE SYSTEM OF UBINAN ASSIST TOOLS IN BUREAU CENTRAL OF STATISTIC SUMEDANG DISTRICT

Betti Noviyani[1], Eko Budi Setiawan [2]

[1.2]Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur 112 – 114 Bandung
E-mail : betti.noviyani@gmail.com[1], eko@email.unikom.ac.id [2]

ABSTRAK

Bureau central of Stastistic is a non-ministerial government agency directly responsible to the President. Bureau central of Stastistic (resume BPS) in cooperation with Directorate General of Food Crops, Ministry of Agriculture to collect data of plant production data every year. One of them is by collecting ubinan survey data that implemented 3 times every year.

The problem faced by the surveyor is that the surveyor felt difficult to determine the location of the crop measurement in the selected field, the surveyor often finds the location of the harvest measurement that passes through the rice field barrier, the surveyor has difficulty determining the direction of the wind for the description of the shape of the location tiles, and the surveyor are difficult to identify errors in the questionnaire due to human error that can lead to misscalculation of food crop productivity in Sumedang district.

Assist tools built in the form of Android-based mobile apps to facilitate tile survey actors at the Central Bureau of Statistics to help solve problems faced in the field. By using the existing features on an Android device that is GPS (Global Positioning System) and compass is expected to make the survey work of the ubinan becomes easier.

Keywords: Ubinan Assist Tools, Survei Ubinan, Android, Black Box Testing, BETA Testing

1. INTRODUCTION

The agricultural sector is one of the sectors that have a significant role in the Indonesian economy. One of the agricultural sub-sectors that has a very strategic role is the food crops sub-sector, which includes rice and palawija crops. The important role of the food crops subsector is in terms of meeting the food needs of Indonesian society. Central Bureau of Statistics (abbreviated BPS) in cooperation with Directorate General of Food Crops, Ministry of Agriculture to collect data on crop production each year. Data of harvested area obtained from Agricultural Statistics (SP) report and productivity data obtained from the results of the Ubinan Survey conducted by BPS and Ministry of Agriculture [1].

As an ubinan data collector, BPS also found some obstacles in its implementation. There are several obstacles that are found when conducting a ubinan survey i.e.:

1. The ubinan surveyor finds it difficult to determine the location of the harvest measurement in the selected field
2. Surveyor of the ubinan survey often finds the location of harvesting measurements passing the rice field divider due to the low accuracy so that the ubinan surveyor has to determine the location of the ubinan again.
3. Surveyor of the ubinan survey feel difficult to determine the direction of the wind for drawing the location of the ubinan location.
4. Surveyor of the ubinan survey is difficult to identify the errors of writing on the questionnaire due to human error that can lead to miscalculation of food crop productivity in Sumedang Regency.

Based on interviews with Mrs. Ima Primasari as Head of Production Statistics Section, she revealed that a technology is needed to record the position of KSK (Sub-district Statistics Coordinator) and staff during the ubinan survey. It is deemed necessary for the position of the ubinan survey to be traced back to the time of examination by the Provincial BPS or the Agriculture Service.

According to observations, only 1 out of 23 people who conduct ubinan survey have not used an Android-based mobile phone. Android has a very good, fast and powerful OS and has an intuitive user interface packed with choice and flexibility [2]. Almost every mobile phone is now equipped with features Global Positioning System or commonly abbreviated with GPS. One of the GPS functions is to determine the position or location where a person is located [3]. In determining the direction of the wind, researchers use the features of a digital compass on the android phone, a digital compass that represents where the user direction of the device is facing [4].

2. RESEARCH CONTENTS

2.1 LITERATURE REVIEW

On the Literature review will discuss the various concepts and theories relating to research conducted

and things that are useful in the process of problem analysis that existed in the Central Bureau of Statistics Sumedang Regency.

2.1.1 Ubinan Survey

The data collection of food crop productivity is done by sampling through Survey Ubinan with the household approach. Rice crops include two kinds of rice crops, while palawija crops include corn, soybeans, peanuts, green beans, cassava and sweet potatoes. The data collection of food crop productivity applies direct measurement method to selected ubinan plots and interview method with sample farmers to collect data on some characteristics related to products such as the use of fertilizer, seed, irrigation, pesticide, planting method, etc. [1].

The following is the outline of the Ubinan Survey data collection process in the field:

1. Counting the number of plots managed by farmers and planting selected crops. Then give the serial number on the number of plots in all the areas managed and planted with selected food crops.
2. The number of plots is multiplied by the random number determined by the Central Statistics Bureau, and the serial number of the selected plots will be obtained and then do the direct measurement.
3. Describing plots in all fields managed and planted with selected food crops at the provided places to determine the direction of the wind.
4. Calculate the length of the side of the plot by using regular footsteps from west to east and from north to south.
5. Make a random number with drop a pencil on random number table with the eye closed to get five numbers. The first number to specify the random number table page to be used (page 1 or page 2), the second and third numbers to specify the row in the random number table (row 1 to row 35), the fourth and fifth numbers to specify the columns in the random number table (column 1 to column 25).
6. From the pages, rows, and columns that have been obtained start looking for four numbers to determine the position of the harvest to be measured results. The first and second numbers to determine the distance from west to east its. The third and fourth numbers to determine the distance from north to south its. The illustrations can be seen in Figure 1 below:

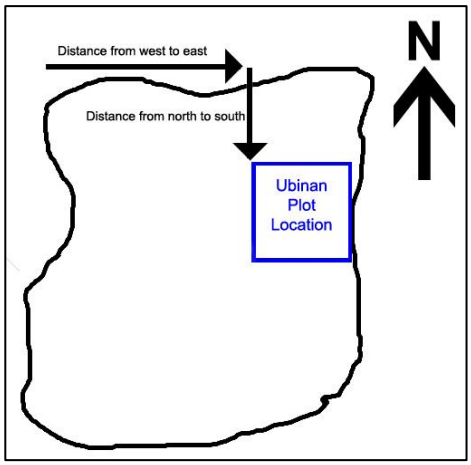


Figure 1 Determining the Position of Measurement of Result Harvesting on the Ubinan Survey

7. From the point that has been obtained, then KSK make measurements of the harvest at that point with the size of the field is harvested that is 2.5 meters long and 2.5 meters wide.
8. After the plot has been harvested, then the harvested dry grain yield (GKP) is weighed and counted the number of clumps. Write down the weight and number of clumps in the questionnaire.
9. Conduct interviews with land managers for questions in the questionnaire (area, planting techniques, use of fertilizers, seeds, rice thresher tool and comparison of previous year's crop yield).

2.1.2 A-GPS

A-GPS (Assisted GPS) or simply A-GPS is a system that accelerates the TTFF (Time To First Fix) or the speed of determining the position at the first time. The average modern smartphone is already using A-GPS to help the global navigation system inside the smartphone to "lock" the satellite quickly. How A-GPS works on an Android smartphone can be seen in Figure 2 below:

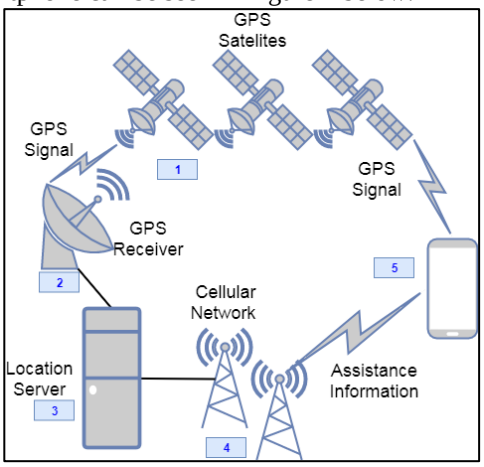


Figure 2 How A-GPS Works

1. GPS is a useful system for determining the location on the surface of the earth with the help of synchronization with satellite signals that transmit micro signals to the earth.
2. Then the micro signal is captured and received by the GPS device on earth and the captured data is processed to get location information, speed, direction and time.
3. The signal is then processed by each location server from each provider which then transmitted through radio signals to many BTS towers.
4. The BTS tower that outputs the signal has a GPS feature that also determines the exact location. And because the scope of a base station is not too far away so that telecom operators have a good signal in all places, so the telecommunication operator must have many BTS towers.
5. BTS is a tall tower that can generate radio signals that are then captured by the phone.

2.1.3 Compass

Compass is a wind direction device in which embedded magnetic device that leads to the north pole and south pole. On the android device, there is a compass feature. But unlike the compass in general, the compass on Android smartphone does not use magnetic components. Smartphones only rely on the program code of the compass and sensor applications contained in android. How the compass works on an Android smartphone can be seen in Figure 3 below:

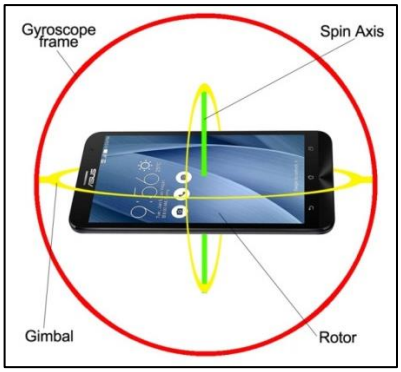


Figure 3 How Compass Work on Android Smartphone

The Accelerometer sensor works by calculating the speed of movement received by a smartphone using shocks received by the smartphone. If the smartphone is brought in motion, the accelerometer will calculate the movement and respond to the device. This sensor works when we shake the smartphone to the left, then the sensor will detect that the sensor moves left and vice versa. But this sensor is limited because it can only read the movement of 3 axes only.

The gyroscope sensor operates with freedom on all three axes. The rotor will maintain its spin axis direction regardless of the orientation of the outer frame. Gyroscopes can be used to build gyrocompasses, which complement or replace the magnetic compass. The gyroscope provides identification of the rotating motion and the earth's gravity and is used to determine the direction of a smartphone, the gyroscope can figure out how the current smartphone's position even without shocks because the gyroscope will identify the angular momentum that allows it to see the orientation of a device.

2.2 System Analysis

System analysis is used to determine the problems that exist on the system and determine the needs of the system built. Analysis of the system in question is SOP analysis of the implementation of the ubinan survey, system architecture analysis, functional requirements analysis and non-functional requirements analysis.

2.2.1 SOP analysis of the implementation of the ubinan survey

The Standard Operating Procedure that should be performed by the executor of the Survey of Ubinan according to the Data Collection Guidance Manual Survey of Food Crops 2015 No. 1303080 Central Bureau of Statistics and Ministry of Agriculture, namely:

1. Blok I. Place Description

This block is the identity of the selected household. Fill out the description of the place according to the SUB-P List. Includes subround and year on the available space.

2. Blok II. Caption Sample Information Grid

The number of fields controlled by selected households is written in Column (1) and field number in Column (2). The number of plots in each field is filled in Column (3) and the cumulative number of the plot in Column (4).

The next step is to determine the random number of the sample. The sampling of plots is done by the formula: AR × I. In this case, since each household is only taken 1 plot as a sample, the plot sampling formula is:

$$R = AR \times N \quad \ldots\ldots (1)$$

The selected plot is the plot number corresponding to selected R. The next selected field is the plot of the selected plot. In the example the number of plots (N) is 7, the random number (AR) listed is 0.27. Selection of selected plots by: $R = 0.27 \times 7 = 1.89 \approx 2$. So the selected plot is the 2nd plot and lies in the 1st plane.

3. Blok III. Sketches of Selected Fields

Once the selected plot is determined, the sketch of the selected field is described in full with the position of the plot in the field. The number and location of the field are filled in the space provided.

The field location is the name of the region where the field is located. The drawing of sketches of selected fields is adjusted to the direction of the wind. Here is an example of drawing a sketch of the selected field in figure 4 below:

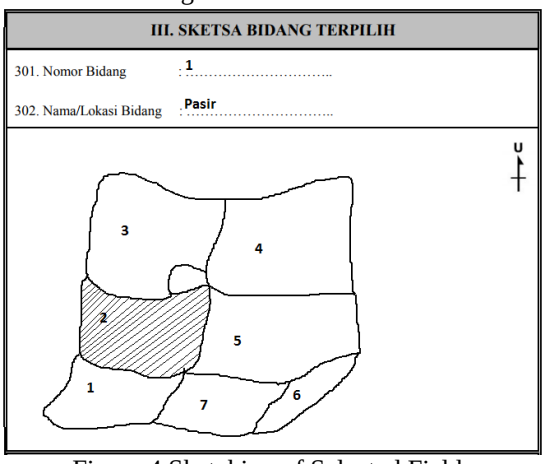
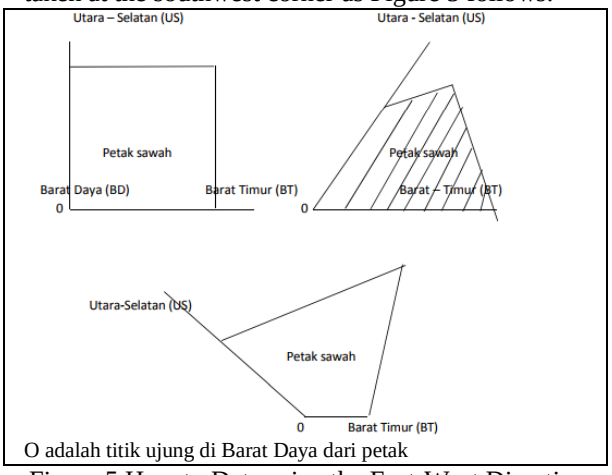


Figure 4 Sketching of Selected Fields

4. Blok IV. Description of the Sample Plot Taking

Question 401: Length of Plot Size (usual footstep)

How to determine the base of the axis for the square-shaped plot, the southwestern end of the plot is used as the base of the axis as in Figure 5. If the plot is not square, the West-East (BT) and the North-South side (US) follow the length of the side of rice field and wherever possible the base of the axis is taken at the southwest corner as Figure 5 follows:



O adalah titik ujung di Barat Daya dari petak

Figure 5 How to Determine the East-West Direction and North South

In exceptional circumstances, where the land is irregular it is rather difficult to choose the base of the axis. In this case, a place in the southwest of the rice field plot is used as the base of the axis, the determination of the direction of B - T and U - S still follows the side of rice field direction. The following example of how the direction determination in the irregular plot can be seen in Figure 6 below:

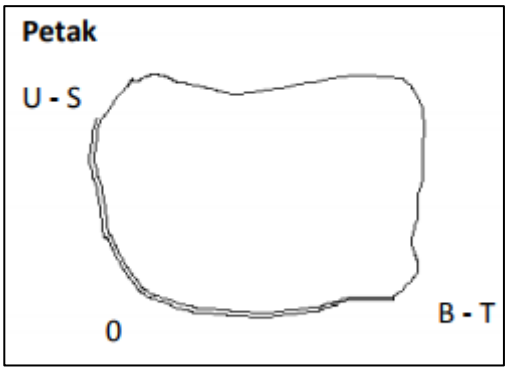


Figure 6 Ways of Determination of the East-North and South-East Direction on Irregular Plots

The lengths of both sides of the rice field plot were measured (side lengths B - T and U - S) using ordinary footsteps (to get randomly tiled locations then not using standard size) and the results are recorded in the space provided.

Question 402: Number of Eyed Rivals

Eyeballs are done by closing the eyes and pointing the numbers in the random number table to get random numbers. How to determine the Eyed Snivel Rate

a. The number of digits from the length of the two sides of the field plot is calculated such as the length of the B-T side in the tens of steps (2 digits) and the U-S side length in tens of steps (2 digits), then the number of digits from both sides of the field plot is 2 + 2 = 4 digits.
b. The 5 digits are randomly selected from the random number table with eye-catching (number of Eyed Rivals) on one of the random number table pages. The random number is to determine what page, row, and column are in the initial random number table. From the initial random number will get the number of pages, rows, and columns to be used as the selected random number. Here are the steps to do the number scaling to get page numbers, rows and columns:
    1) Prepare Random Number Table (TAR) consisting of 2 pages.
    2) Each page consists of 25 columns and 35 rows. Each page is numbered 1, 2, 3, ... 25 and line numbers 1, 2, 3, ..., 35.
    3) Open one of the pages of 2 TAR pages that have been prepared. For this purpose can be used any TAR pages. Eyeballs or divert the view to another place, and place the end of a pencil or pointed object on top of a TAR sheet. The number closest to the position of the tip of the pencil is the starting point of reading the random number to determine which pages, rows, and columns will be used to select R1. Start from this point read 5 numbers to the right.

Figure 7 below is an example of the result of a fix on the random number table:

Contoh Hasil Picingan pada Tabel Angka Random

	.	14	15	16	17	18	19	20	21	22	23	24	25
.													
.		9	2	9	1	0	8	2	5	3	7	5	9
27		9	1		7	4	6	6	0	2	9	4	3
28		2	5	1	**2**	**6**	**3**	**8**	**7**	9	7	8	4
29		8	9	7	0	1	5	0	8	7	7	5	6
30		4	3	3	4	9	1	3	3	4	8	6	8

Lima angka di sebelah kanan tanda titik (.) adalah **26387**

Figure 7 Example of Picingan Results on Random Number Table

Five-digit eyeball numbers obtained by eyepiece are loaded in the space provided.

Question 403: Initial Random Number

From the number of eye piercing, it will specify the page number, row, and column to get the Selected Random Number. The steps for determining page numbers, rows, and columns are as follows:

a) Determination of TAR reading page

Since there are 2 TAR pages, the random number used to define this page is one digit. For simplicity, use the numbers 0, 1, 2, ..., 9 provided that the odd number declare the first page of the Random Table, the number 0 (zero) or even for the second page.

In the above reading, ie 26387, the first digit is 2 (even). Therefore the selected page is the second page of TAR.

b) Line Determination

Because on each page there are 35 lines, then for the determination of this line used numbers consisting of 2 digits. For austerity, it is determined that numbers 01, 36, and 71 are used to represent row 1. Numbers 02, 37, and 72 are used to represent row 2, and so on.

At the above reading (26387), the 2nd and 3rd digits are 63, then the reading line falls on the 28th line because of 63 - 35 = 28.

c) Column Determination

Because on each page, there are 25 columns, so for the determination of this column used numbers consisting of 2 digits. For savings, it is determined that numbers 01, 26, 51, and 76 are used to represent column 1. Numbers 02, 27, 52, and 77 are used to denote columns 2, and so on.

In the above reading, the 4th and 5th digits are 87, then the reading line falls on the 12th column because of 87- (25 + 25 + 25) = 12.

So the TAR used is page 2, line 28 and column 12.

Once you get the page number, row, and column, look back to TAR. Taken digit number as many digits of the length of both sides of the rice field plot. Number of Pages, Lines, and Columns obtained from the number of eyed rivals filled in place that has been provided.

Question 404: Selected Random Number

Previously specified 4 digits consisting of the first 2 digits indicate the B-T side coordinates, while the last 2 digits indicate the U-S side coordinates. If from the random number it turns out that the first 2 digits and or the last 2 digits are still higher than the length of both sides, it is not yet qualified and should be continued to the next line (down), and if still not found then forwarded to the next 4 columns until it can meet required terms.

Fill in the selected random number (eligible) in the determination of the center point of the tile, namely X (West-East direction) and Y (North-South direction). KSK and KCD agriculture subsequently carried out measurements of harvests with harvested area 2.5 meters x 2.5 meters at the ubinan center point that has been produced.

Question 405: Date of Delivery to BPS / Distan District / City

5. Blok V. Officer's Description

Question 501 to 506 contains the name of the enumerator, the name of the supervisor/examiner, the date of enumeration, the date of supervision/examination.

6. Blok VI. General Description of Selected Plant

Question 601: Land Type:

Question 602: Multiple Size

Question 603: If detail 602 is coded 2

Question 604: Area of Similar Plant in the Field Where There Is Selected Lines

Question 605: How to Planting

Question 606a: Jajar Legowo planting system

Question 606b: Jajar Legowo planting pattern

Question 607: Efforts to increase production

Question 608: The number of seeds used in the field where there are ubinan plots/plots

Question 609: Group of varieties

Question 610: The amount of fertilizer used

Question 611: How to control pests/OPT (Plant Attacking Organisms)

7. Blok VII. Ubinan Result

Question 701: Weight Outputs of ubinan.

Question 702: Number of Clumps in an Ubinan Plot

8. Blok VIII. Supporting Description

Question 801: Seed Assistance

Question 802: Fertilizers Help

a. Do you get fertilizer assistance this year? Circle code 1 if "Yes, free", code 2 if "Yes, price subsidy", and code 3 if "No".
b. If the details of 802a are coded 1 or 2, the code of origin of the fertilizer aid obtained is circled. Then filled in the box provided.

Question 803: Farmer Group Members

a. Is being a member of a farmer's group? Circle code 1 if "Yes", code 2 if "No". If the details of 803a are coded 1, does the farmer group get the help of agricultural machinery? Circle code 1 if "Yes" code 2 if "No". If the details of 803b are coded 1, what kind of agricultural machine tool aid is accepted?
b. If the 803b details are coded 1, is the help of the accepted agricultural machine tool useful ?, circle code 1 if "Yes" code 2 if "No".

Question 804: Pest Attacks

Question 805: Climate Change Impact (Flood or Drought)

Question 806: Water Sufficiency (according to the perception of respondent)

Question 807: Especially for Rice, Corn, and Soybean, Temporary Stacking Base Before Threshing / Slaughtering / Peeling

Question 808: Especially for Rice, Corn, and Soybeans, Size of Threshing / Peeling / Peeling Pads

Question 809: Comparison of Productivity / Results per Hectare in the Field Where Plots are Tiled In This Year Compared To Last Year On The Same Subround (according to respondents' perceptions)

Question 810: Comparison of Productivity / Results per hectare in Respondents' Areas This Year Compared to Last Year in the Same Subround (according to the respondent's perception)

9. Blok IX. Note

Blok IX is used to record all additional information related to unnatural ubinan surveys or other information deemed necessary.

2.2.2 System Architecture Analysis

In the application architecture to be built consists of several components, namely: Users will fill in the description on block 1 and automatically the smartphone will capture the GPS signal to get the location of the user. Once the location is obtained, the latitude and longitude points are stored in the database.

Users can view the saved location into the database after they have filled in block 1 and when they want to fill the other blocks, it will appear on the map of block 1 location. The description of system architecture can be seen in Figure 8 below:

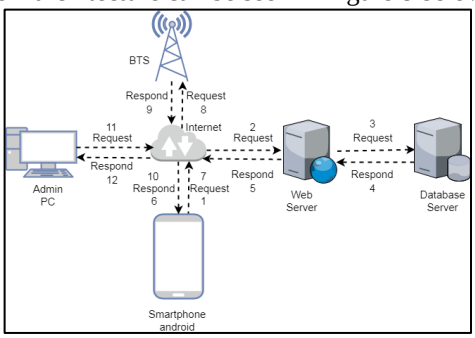


Figure 8 System Architecture to be Built

1. Users who access the application on the smartphone request a command that must pass through the internet first.
2. The web server receives a request from smartphone and determines request type.
3. Smartphone device user request data to the database server.
4. The request will be returned as a response from the database server to web server.
5. Respond forwarded to the smartphone through the internet first.
6. Through the internet, the smartphone receives data taken from the database server.
7. The smartphone will again request a command over the internet to get the user's location.
8. Request forwarded to the nearest BTS.
9. Once the user's location is obtained, the BTS will return a request to a user via the internet.
10. The user receives information in the form of coordinate point of a user from BTS through the internet.

2.2.3 Functional Requirements Analysis

Use case Diagram is one diagram to model aspects of system behavior. From the analysis of existing application users, the following is a use case diagram that can be seen in Figure 9 below:

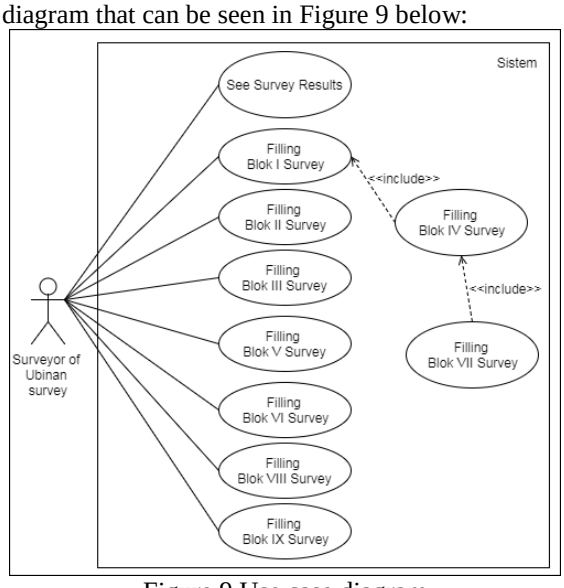


Figure 9 Use case diagram

2.2.4 Non-Functional Requirements Analysis

Non-functional requirements include several analyzes and one of them is the analysis of hardware requirements. Hardware is one of the main supporting factors in running a system. The recommended hardware in the use of the Ubinan Tools software is the Android operating system hardware that features A-GPS and Compass.

2.3 System planning

The design needed for the development of this system is the Design of Program Functionalities to be built, Relation Scheme and Interface Design.

2.3.1 Design of Program Functionalities to be built

An ubinan tool system will be constructed using a form of 9 forms according to the number of blocks in the tiled questionnaire from block 1 to block 9. This is so that users are not difficult to adapt to the ubinan mobile questionnaire. The form to be built are:

1. Blok 1

Block 1 has a function to fill in information about the introduction of the place, the respondent's description and the random number determined by the central BPS according to the tile questionnaire in block 1. In this block also, the system will take the coordinate point using GPS and then stored in the database. After the save button is pressed, then the data will be stored in the database and the user will be directed to a page where there are menu options from block 2 to block 9. This is so that users can choose which blocks will be filled first.

2. Blok 2

Block 2 has the function to fill in information about the number of fields and plots planted with similar plants (plants that become sample of ubinan) and the system will automatically calculate which plot is the location of the measurement of the harvest. After the save button is pressed, then the data will be stored in the database.

3. Blok 3

Block 3 has the function to fill in the name of the location of the ubinan survey (if there is a special name) and a place to describe the shape of the selected field in the direction of the wind direction. In this block, the system will display the compass to make it easier for the user to map the map and determine the appropriate direction of the wind. After the save button is pressed, then the data will be stored in the database.

4. Blok 4

Block 4 has the function to fill in the measurement information of the length and width of the plot as measured by regular footsteps in selected plots from the east-west and north-south directions. Once loaded, the user is requested to make eye contact on the random number table and the system will automatically determine the location of the measurement of the harvest by checking whether the location is indicated over the plot boundary or not. After the save button is pressed, then the data will be stored in the database.

5. Blok 5

Block 5 has the function to fill in the officer's information and record the time of execution of ubinan by the system. After the save button is pressed, then the data will be stored in the database.

6. Blok 6

Block 6 has a function to fill in information on the description of selected cultivation of plants, ranging from the type of land, the area of land, planting techniques, the number of seeds, the amount of fertilizer, and the way pest prevention. After the save button is pressed, then the data will be stored in the database.

7. Blok 7

Block 7 has a function to fill in information about the harvests made at the designated location. The recorded information is the weight of the harvest in kilograms and the number of clumps or plant trees that are in the ubinan plot (2.5m X 2.5m). In this block, the system will examine whether or not the weight of the harvest is reasonable by comparing its content with the productivity data released by the agricultural service each year. If the contents are out of range, then the system will display a message to avoid miss-filling. After the save button is pressed, then the data will be stored in the database.

8. Blok 8

Block 8 has a function to fill in information about supporters' information such as this year's comparison with the previous year, participation in farmer groups and any assistance received during the planting period. After the save button is pressed, then the data will be stored in the database.

9. Blok 9

Block 9 has a function to fill in notes about additional information the user wants to register on the ubinan survey. After the save button is pressed, then the data will be stored in the database.

2.3.2 Relation Scheme

In the development of System Tools Ubinan, of course, require data support. In addition, the data entered on the Ubinan Tools system will be stored in a Database. The data that will be required and not changed during the use of the Relation between tables for data processing on the System Tools Ubinan can be seen in Figure 10 below:

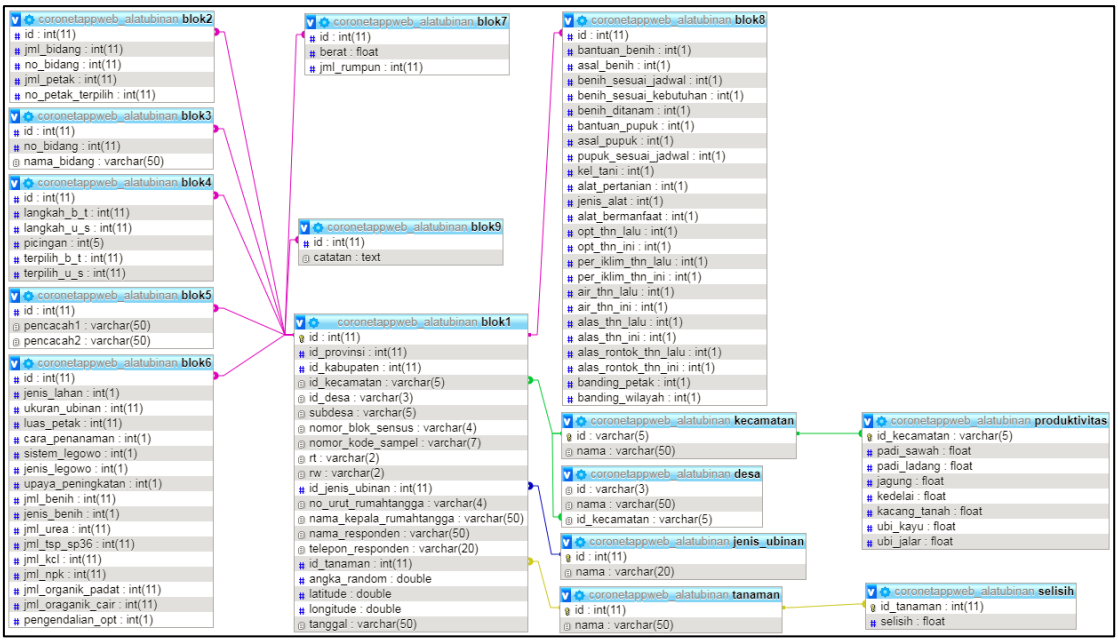


Figure 10 Relation Scheme

2.3.3 Interface Design

Interface (interface) is a form of display of programs that appear on the Android device that aims to provide an overview of the application to be built, so it will facilitate the implementation of the application according to screen size and facilitate in making the application. Interface design for Ubinan Tool Blok I can be seen in Figure 11 below:



Figure 11 Interface Design for Blok I Form

2.4 System Testing

The testing system aims to determine whether the system is made already meet the criteria and in accordance with the objectives to be achieved. The test is done by two stages of the alpha testing stage and beta testing.

2.4.1 Testing Plan

Testing the system to be done is divided into two stages. The first stage of alpha testing is program testing based on the function of the program using the black-box testing method. The second stage of research conducted on the respondents or users of the system by conducting data collection using questionnaires. The method used in this research is Likert scale method. Tests conducted by using questionnaires given to 23 employees of the Central Bureau of Statistics Sumedang. With 7 statements answered with 5 categories of answers that can be seen in table 1 below:

Table 1 Answer Category Questionnaire

Answer Category	Weight	Range Percentage
Strongly Disagree (STS)	1	0% - 20%
Less Agree (KS)	2	21% - 40%
Simply Agree (CS)	3	41% - 60%
Agree (S)	4	61% - 80%
Strongly agree (SS)	5	81% - 100%

Will be searching the percentage of each answer by using the formula:

$$Y = \frac{TS}{\text{Ideal Score}} \times 100\%$$

Information:

Y = Percentage Value

TS = Total Score of respondents = ∑weight x frequency

Ideal Score = Maximum weight x number of respondents

The given statement consists of 7 statements namely:

1. This application helps you to get the right position in the measurement of the harvest in the field
2. This application helps you avoid the position of a ubinan past the rice field or garden divider
3. This application allows you in determining the direction of the wind in the field
4. This application helps you reduce the error of writing the questionnaire of the Ubinan Survey
5. App display is easy to understand
6. This app is easy to use
7. This application helps you in doing the ubinan survey in the field

2.4.2 Alpha Testing Results

Based on the tests that have been done, then the conclusion obtained that the poses- processes on application implementation has been through the improvement phase and has been maximized as well as functionally has produced the expected output so that the system is feasible to use.

2.4.3 Beta Testing Results

Here is the result of calculating the percentage of answers selected by 23 respondents of the application research ubinan tool:

1. Processing of First Statement

"This application helps you to get the right position in the measurement of the harvest in the field"

Table 2 Processing of first statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	7	35
Agree	4	16	64
Simply Agree	3	0	0
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	99

Then obtained the results of the calculation as follows:

$$Y = \frac{99}{5 \times 23} \times 100\% = 86\%$$

2. Processing of second Statement

"2. This application helps you avoid the position of a ubinan past the rice field or garden divider"

Table 3 Processing of second statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	5	25
Agree	4	16	64
Simply Agree	3	2	6
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	95

Then obtained the results of the calculation as follows:

$$Y = \frac{95}{5 \times 23} \times 100\% = 82\%$$

3. Processing of Third Statement

"This application allows you in determining the direction of the wind in the field"

Table 4 Processing of third statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	7	35
Agree	4	14	56
Simply Agree	3	2	6
Less Agree	2	0	0
Strongly Disagree	1	0	0
Jumlah		23	97

Then obtained the results of the calculation as follows:

$$Y = \frac{97}{5 \times 23} \times 100\% = 84\%$$

4. Processing The Fourth Statement

"This application helps you reduce the error of writing the questionnaire of the Ubinan Survey"

Table 5 Processing of fourth statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	6	30
Agree	4	15	60
Simply Agree	3	2	6
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	96

Then obtained the results of the calculation as follows:

$$Y = \frac{96}{5 \times 23} \times 100\% = 83\%$$

5. Processing of the Fifth Statement

"App display is easy to understand"

Table 6 Processing of fifth statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	6	30
Agree	4	15	60
Simply Agree	3	2	6
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	96

Then obtained the results of the calculation as follows:

$$Y = \frac{103}{5 \times 23} \times 100\% = 89\%$$

6. The Processing of the Sixth Statement

"This app is easy to use"

Table 7 Processing of sixth statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	11	55
Agree	4	11	44
Simply Agree	3	1	3
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	102

Then obtained the results of the calculation as follows:

$$Y = \frac{102}{5 \times 23} \times 100\% = 88\%$$

7. The Processing of the Seventh Statement

"This application helps you in doing the ubinan survey in the field"

Table 8 Processing of seventh statement

Answer Category	Weight	Frequency of Answer	Total Score
Strongly Agree	5	8	40
Agree	4	14	56
Simply Agree	3	1	3
Less Agree	2	0	0
Strongly Disagree	1	0	0
Amount		23	99

Then obtained the results of the calculation as follows:

$$Y = \frac{99}{5 \times 23} \times 100\% = 86\%$$

3. CLOSING

3.1 Conclusions

Based on the results obtained from research conducted in the preparation of the final task that refers to the purpose of research, it can be concluded.

1. Executing a ubinan survey can use a ubinan tools application to perform calculations using a random number table automatically to facilitate a ubinan surveyor to get the right position in the measurement of the harvest result in the field.
2. The Executor of the Ubinan Survey will get the measurement position of the harvest result that does not pass the side of the rice field or the possibility of the location of the ubinan passing through the side of the rice field is minimized.
3. The executor of the ubinan survey can see the compass directly through the application. This can facilitate the executor of the ubinan survey in determining the direction of the wind.
4. The executor of the ubinan survey will get a warning when the tiling result exceeds the productivity data plus or minus with the fair difference of each commodity. This can detect errors in the writing of the ubinan survey results by an ubinan surveyor due to human error at the time of filling the ubinan result.

3.2 Saran

This application needs further development, therefore there are some suggestions that can be used as a blend of software development in a better direction to support the implementation of the ubinan survey. The suggestions on the development of ubinan tool applications are as follows:

1. Improving the quality in providing data in the form of number of census blocks, RT and RW per village per sub-district to make the surveyor easier by using ubinan tools.
2. Improve the features of ubinan tools so that data can be entered directly created a report so that it can be processed directly by the Central Bureau of Statistics.
3. Develop software in terms of performance. Limitations of server and hosting become a drawback. Disadvantages that occur server sometimes down so that the application can not be accessed and the use of bandwidth quota hosting needs to be improved
4. Develop a platform that can be supported by software, considering currently only supports android platform. Because this reflects the wider community who not only use android smartphone only.

REFERENCES

[1] Badan Pusat Statistik and Kementerian Pertanian, Pedoman Pengumpulan Data Survei Ubinan Tanaman Pangan 2015. Jakarta: Badan Pusat statistik, 2015.

[2] Surawijaya Surahman and Eko Budi Setiawan, "Pembangunan aplikasi Mobile Driver Online Berbasis Android (Studi Kasus PT. Tunas Jaya Persada)," p. 2, 2017.

[3] Latifa Khairani, R. A. Eva Soraya, Johannes Petrus, and Rachmansyah, "Rancangan Bangun aplikasi Pemantauan Posisi Anggota Keluarga Berbasis Android," p. 1, 2013.

[4] Luqman Hakim, Rifqi Budi Raharjo, and Didik Dwi Waluyo, "Prototype Robot Untuk Menentukan Arah Kiblat Dengan Tanda Shaf Sholat," p. 2, 2013.