Closed Beta Testing on e-Label Batik Application to Know the Best Environment for Optimal Application Performance

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Abstract—*The Batik of Pekalongan is a heritage that continues to be maintained and until now it is still used as a source of livelihood for the majority of the people in Pekalongan city, so the city of Pekalongan is known as the city of batik. However, the existence of batik is facing a serious threat, caused by the abundance of textile products with batik motifs (batik printing) on the market, but not matched by increased public knowledge of batik.*
Various efforts, both in Pekalongan city government through the labeling of batik, and ASEPHI in Pekalongan city through the implementation of original batik hologram, has been done to maintain the sustainability of batik. But this has not yet provided optimal results, because it is still found that the fraudulent batik seller who put the original batik label/hologram on batik printing, thus harming the society, harming batik craftsmen/producers and tarnish the batik image of Pekalongan city. This happened because the batik label or the original batik hologram had not been connected to a computer-based information system, so that they cannot monitor and validate the attachment of original batik labels/holograms.
For this reason, researchers developed a e-label batik application that was able to be used by the community to scan batik labels that produced by the e-label batik application, so that can know information the authenticity of the batik. The application is also equipped with facilities that provide convenience to monitor, validate, get feedback from the community and become a learning media for the community towards batik. The development of e-label batik applications has gone through the stages of alpha testing and continued with closed beta testing to find out the ideal environment, So that the performance of the batik e-label application is optimal, and can be used properly by the community.

Keyword—*batik, e-label batik, closed beta test, performance, optimal.*

1. Introduction

Batik Pekalongan city is a legacy that continues to be preserved and used as a source of livelihood for the majority of the people in Pekalongan city, so that the city of Pekalongan is known as the city of batik and batik is a typical product of Pekalongan city. However, today the existence of batik is facing severe challenges, caused by the abundance of textile products with batik motifs (batik printing) on the market but it is not balanced with the increasing knowledge of the people about batik, so that it has an impact on:

1. the emergence of misperceptions of the people who consider textile products with batik motifs (batik printing) are batik, so that it provides an opportunity for individuals who sell batik to seek profits by cheating, by offering products that are sold are batik. Actually textile products with batik motifs not only harm the people who buy the product, but also batik craftsmen / producers and at the same time tarnish the batik image of Pekalongan city [1] [2].
2. Cheaper selling prices owned by textile products with batik motifs, thus encouraging people to prefer to buy batik-based textile products compared to original batik and this becomes one factor in the decline in sales turnover Pekalongan batik city and threatens the sustainability of Pekalongan city batik craftsmen / producers.

Based on this, several stakeholders have tried to overcome it through the following methods:

1. The Pekalongan city government has issued Peraturan Daerah Nomor 6 Tahun 2014 about the use of Pekalongan batik labels, as a protective effort for the batik of Pekalongan city, batik craftsmen / producers of Pekalongan city and people who buy batik in / from Pekalongan city [3].

2. Asosiasi Eksportir dan Produsen Handicraft Indonesia (ASEPHI) Pekalongan City which accommodates the batik producers of Pekalongan City, has announced the use of original batik hologram on April 12, 2016, as an effort to provide a marker for the community that the product they buy is authentic batik, not textile products with batik motifs. this makes people not easily deceived by unscrupulous batik sellers.

However, these efforts have not provided optimal results, because there are still people who sell batik that put the original batik label/hologram not on the designation. For example, label/hologram batik tulis is affixed to batik cap, thus harming the people who bought it. This can happen because original batik labels and holograms have not been connected to computer-based information system, so that they cannot monitor and validate the attachment of original batik labels/holograms.

To overcome it, researchers developed a e-label batik application that could be used by the community to scan the batik label so that information on the authenticity of the batik can be known. The application is equipped with facilities that make it easier for relevant stakeholders to monitor, validate, get feedback from the community and become a community learning media for batik. The e-label batik

application developed by researchers is an augmented reality based application that can be accessed from various devices and operating system so that it will make it easier for users. To utilize the application, users can directly access it through the available site address. The following is the technical specification of the e-label batik application (table 1):

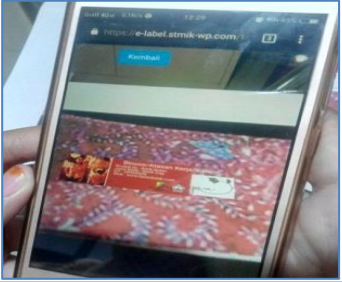Table 1. technical specification of the e-label batik application

No	Type	Explanation
1	Language Programming & Markup Language	Client Side : Javascript, HTML & CSS Server Side : PHP
2	Database (DBMS)	Mysql
3	Plugins & Framework	AR.js, JQuery, Datatables, A-frame, Bootstrap, Onsen UI, Codeigniter
4	Type of Marker	Barcode Data Matrix
5	Web browser for access apps	Google Chrome, Mozilla Firefox, dll
6	Device for access apps	Handphone/smartphone, tablet, laptop, pc, dll

There are 3 groups of users who can take advantage of the batik e-label application, that is:
1. Manager/administrator user
   Is the party appointed by the Pekalongan/ASEPHI city government in Pekalongan city. His authority is managing membership, printing batik labels, validating batik labels, monitoring the use of batik labels and managing feedback from the community.

2. Batik craftsmen/producers
   His authority is to register membership, manage his business profile, register his production batik to get batik labels and follow up on feedback from the community.

3. Community
   His authority is to be able to scan batik labels that attached on batik product to get information on the authenticity of batik, can learn various information about batik and can submit complaints/criticisms /suggestions and get a reply.

For batik craftsmen/producers, can use the application after registering membership to the application and validated by the manager/administrator. For community user there is no need to register. The following is the appearance of the e- label batik application (table 2):

Table 2. General description of e-label batik application

No	Display/Interface	Explanation
1		There are 3 batik labels produced by the application, that is: 1. Batik tulis label 2. Batik cap label 3. Batik kombinasi (combine two of above) label
3		A menu that will be used by the public community to scan the original batik label.
4		Information display on the smartphone, after a successful scan batik label.
5		Details of the information displayed from the results of scanning the batik label.

The e-label batik application has gone through the stages of alpha testing conducted by researchers and the test results show that the application has good performance for the clarity and speed of information displayed when the batik label is scanned with a smartphone camera. The next stage of testing is to do a closed beta test, by inviting 10 users (not the research team) who will be asked to scan the batik label that has been provided with hardware, software and test cases that have been determined.

2. Material and Methods

The following are the preparation stage for testing the closed beta application of the e-label batik, that is:
1. Setting up the application

2

The e-label batik application has been uploaded to hosting, so it can be accessed easily by users.

2. Prepare test cases

The following is a test case (table 3) to test the clarity and the speed of information is displayed:

Table 3. Closed beta test case for e-label batik application

NO	TEST CASE
1	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Distance scan 5 cm with the position of the scanner is perpendicular 90^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
2	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Distance scan 10 cm with the position of the scanner is perpendicular 90^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
3	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Distance scan 5 cm with the position of the scanner is perpendicular 90^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
4	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Distance scan 10 cm with the position of the scanner is perpendicular 90^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
5	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Scan distance 15 cm with the scan slope position is 45^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
6	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Scan distance 15 cm with the scan slope position is 70^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
7	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Scan distance 15 cm with the scan slope position is 45^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
8	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Scan distance 15 cm with the scan slope position is 70^0 ☐ Users are free to choose from 3 options resolution smartphone camera (5 MP / 8 MP / 13 MP)
9	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Distance scan 15 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 5 MP
10	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Distance scan 15 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 8 MP
11	☐ Using web browser of Google Chrome Ver. 69.0.3947.100 ☐ Distance scan 15 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 13 MP
12	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Distance scan 10 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 5 MP
13	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Distance scan 10 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 8 MP
14	☐ Using web browser of Mozilla Ver. 62.0.2 ☐ Distance scan 10 cm with the position of the scanner is perpendicular 90^0 ☐ The user uses the smartphone camera resolution 13 MP

3. Prepare the recording form of the test results

The following is the recording form of the test results (figure 1) which is used to record the test results obtained by the user:

TESTING RESULT LISTING FORM Instructions:

Give a ☐ mark on your answer choices TYPE OF

TESTING: ☐SPEED   ☐CLARITY
NAME: _____

NO	CHOICE OF OPTIONS
1	Very Unclear / Very Slow
2	Not clear / Slow
3	Pretty Clear / Fast Enough
4	Fast / Clear
5	Very Fast / Very Clear

TEST CASE	RESULTS				
	1	2	3	4	5
Test Case No. 1					
Test Case No. 2					
Test Case No. 3					
Test Case No. 4					
Test Case No. 5					
Test Case No. 6					
Test Case No. 7					
Test Case No. 8					
Test Case No. 9					
Test Case No.10					
Test Case No.11					
Test Case No.12					
Test Case No.13					
Test Case No.14					

Figure 1. Form for recording test results

4. Prepare the same hardware and software for all users

Hardware use:
☐ 10 smartphone Samsung J1 with a 5 MP camera resolution
☐ 10 smartphone Samsung J2 Prime with 8 MP camera resolution
☐ 10 smartphone Xiomi Note 4 with 13 MP camera resolution

Software use:
☐ E-label Batik Application
☐ Google Chrome Web browser version 69.0.3947.100
☐ Mozilla Web browser version 62.0.2

5. Prepare a room that will be used by all users

Testing will be carried out in the same room with the same lighting conditions.

6. Invite users

Invite randomly, 10 people (not including the development team / research team) to do a closed beta

test of the e-label batik application. Everyone will test 2 types of tests and each type of test has 14 test cases.
7. Conduct testing
Testing will be carried out in stages, from July 16 2018 to July 18 2018
8. Perform data processing and analysis of test results

3. Results and Discussion

To facilitate the analysis, the results of the tests are divided into 6 groups of 28 existing test cases (14 kasus uji kecepatan dan 14 kasus uji kejelasan), that is:

1. Speed testing using Mozilla or Google Chrome, scan position perpendicular to 90^0, the user is free to choose the camera resolution het provided and the scan distance is 5 cm or 10 cm.
2. Clarity testing using Mozilla or Google Chrome, scan position perpendicular to 90^0, the user is free to choose the camera resolution het provided and the scan distance is 5 cm or 10 cm.
3. Speed testing using Mozilla or Google Chrome, position scan tilt 45^0 or 70^0, the user is free to choose the camera resolution het provided and the scan distance is 15 cm
4. Clarity testing using Mozilla or Google Chrome, position scan tilt 45^0 or 70^0, the user is free to choose the camera resolution het provided and the scan distance is 15 cm
5. Speed testing using Mozilla or Google Chrome, scan position perpendicular to 90^0, scan distance is 15 cm and camera resolution is determined
6. Speed testing using Mozilla or Google Chrome, scan position perpendicular to 90^0, scan distance is 15 cm and camera resolution is determined

4. Test Results
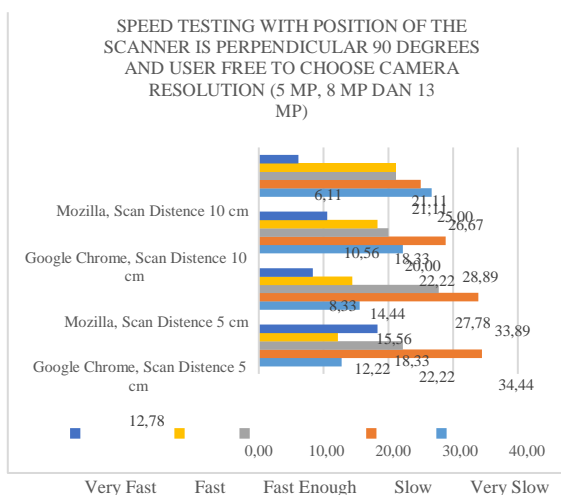1. Group 1 results as shown in Figure 2 below

Figure 2. Group 1 Test Results

The category of the speed of the appearance of information that does not interfere with the user is quite fast, fast and very fast, so that if the three values are summed up, the following results are obtained:

☐ The value of the test case with Mozilla and the scan distance of 5 cm is 50.56
☐ The value of the test case with Google Chrome and the scan distance of 5 cm is 52.78
☐ The value of the test case with Mozilla and the scan distance of 10 cm is 48.33
☐ The value of the test case with Google Chrome and the scan distance of 10 cm is 48.89

Of the four values above, the test cases that have values above 50 are only those with a scan distance of 5 cm, scanned perpendicular to 90^0, using Mozilla and Google Chrome and camera resolution between 5 mp or 8 mp or 13 mp.

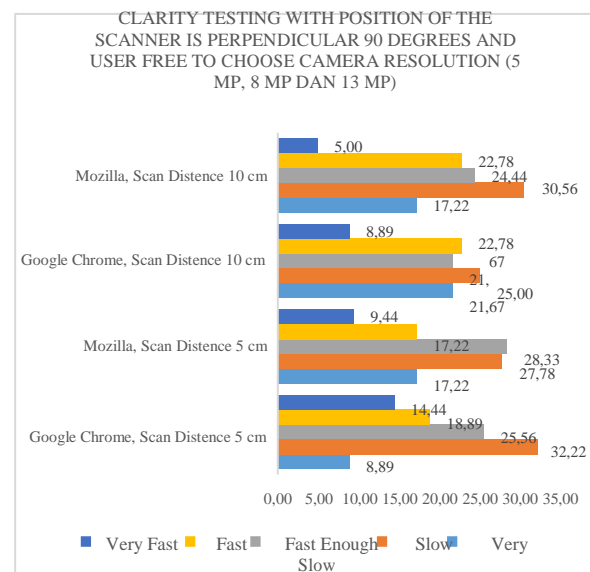2. Group 2 results as shown in Figure 3 below:

Figure 3. Group 2 Testing Results

The category of clarity of information that can still be read well by users is the category of quite fast, fast and very fast, so that if the three values are summed up, the following results are obtained:

☐ The value of the test case with Mozilla and the scan distance of 5 cm is 55.00
☐ The value of the test case with Google Chrome and the scan distance of 5 cm is 58.89
☐ The value of the test case with Mozilla and the scan distance of 10 cm is 52.22
☐ The value of the test case with Google Chrome and the scan distance of 10 cm is 53.33

All test case results have values above 50, so the scan distance, scan position perpendicular to 90^0, web browser and camera resolution do not affect application performance in displaying information that can be read well by the user.

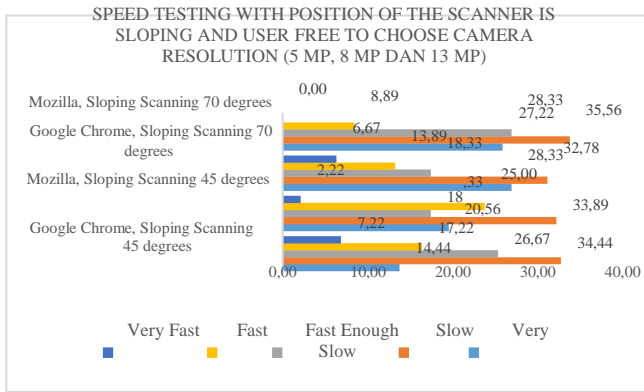3. Group 3 results as shown in Figure 4 below:

Figure 4. Group 3 Testing Results

The category of the speed of the appearance of information that does not interfere with the user is quite fast, fast and very fast, so that if the three values are summed up, the following results are obtained:

- ☐　The value of the test case with Mozilla and scan slope
  70^0 is 37.22
- ☐　The value of the test case with Google Chrome and
  scan slope 70^0 is 38.89
- ☐　The value of the test case with Mozilla and scan slope
  45^0 is 45.56
- ☐　The value of the test case with Google Chrome and scan slope 45^0 is 51.11

Of the four values above, only test cases use Google Chrome, with scan slope 45^0, scan distance is 15 cm and camera resolution is between 5 mp or 8 mp or 13 mp, which has a value above 50.

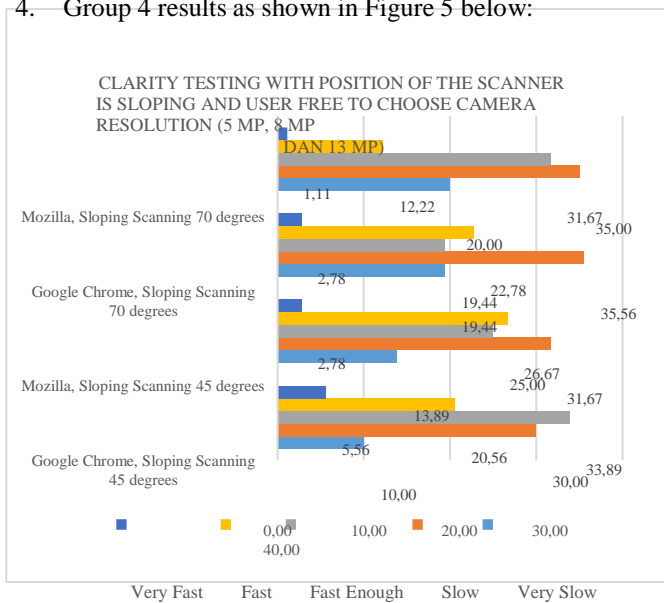4.　Group 4 results as shown in Figure 5 below:

Figure 5. Group 4 Testing Results

The category of clarity of information that can still be read well by users is the category of quite fast, fast and very fast,

so that if the three values are summed up, the following results are obtained:

- ☐　The value of the test case with Mozilla and scan slope
  70^0 is 45.00
- ☐　The value of the test case with Google Chrome and scan slope 70^0 is 45.00
- ☐　The value of the test case with Mozilla and scan slope
  45^0 is 54.44
- ☐　The value of the test case with Google Chrome and scan slope 45^0 is 60.00

Of the four values above, the test case has a value above 50, only in the test case with a 45^0 scan, scan distance 15 cm, using Mozilla and Google Chrome, and camera resolution between 5 mp or 8 mp or 13 mp.

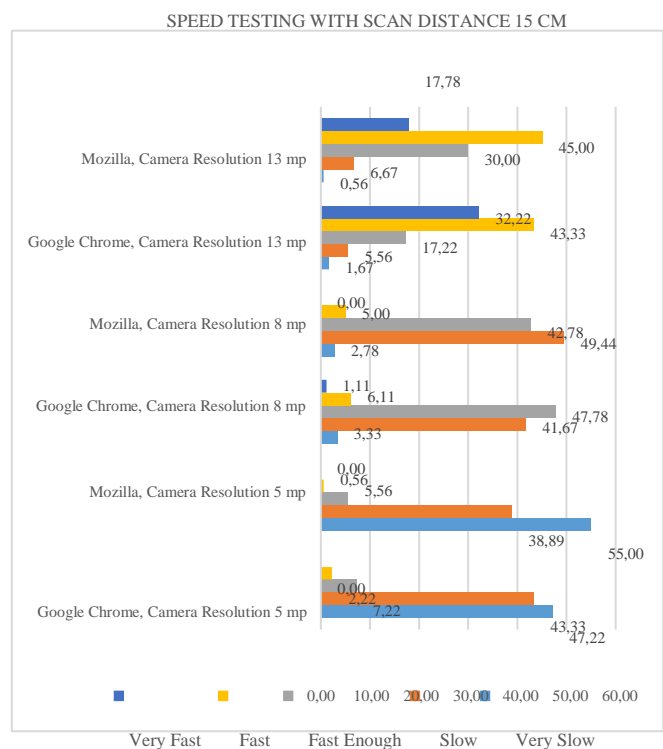5.　Group 5 results as shown in Figure 6 below:

Figure 6. Group 5 Testing Results

The category of the speed of the appearance of information that does not interfere with the user is quite fast, fast and very fast, so that if the three values are summed up, the following results are obtained:

- ☐　The value of the test case with Mozilla and camera resolution 13 mp is 92.78
- ☐　The value of the test case with Mozilla and and camera resolution 13 mp is 92.78
- ☐　The value of the test case with Mozilla and camera resolution 8 mp is 47.78
- ☐　The value of the test case with Google Chrome and camera resolution 8 mp is 55.00
- ☐　The value of the test case with Mozilla and camera resolution 5 mp is 6.11
- ☐　The value of the test case with Google Chrome and camera resolution 5 mp is 9.44

5

Of the six values above, there are only 3 test cases that have values above 50, that uses a camera resolution of 13 mp, scan position perpendicular to 90^0, scan distance 15 cm, one uses Mozilla while the other is Google Chrome. As well as one more for a test case that uses an 8 MP camera resolution, scan position perpendicular to 90^0 dan and use Google Chrome.

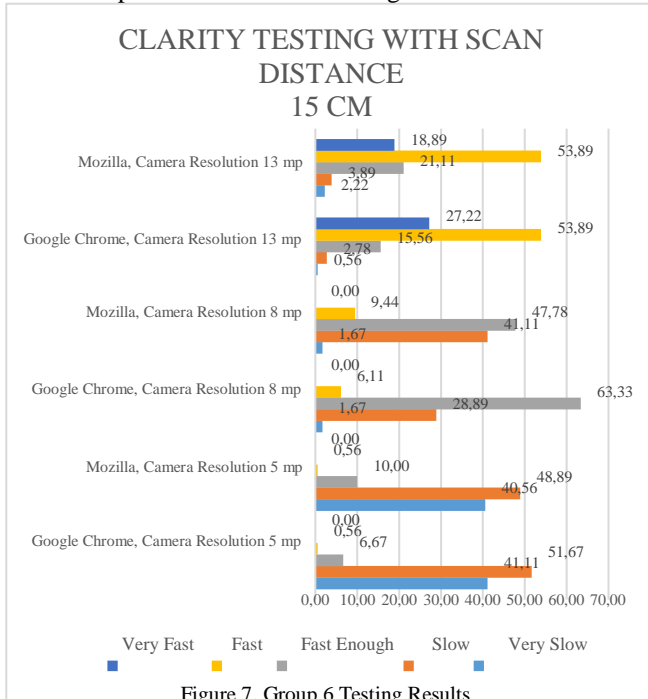6.   Group 6 results as shown in Figure 7 below:

Figure 7. Group 6 Testing Results

The category of clarity of information that can still be read well by users is the category of quite fast, fast and very fast, so that if the three values are summed up, the following results are obtained:

- ☐ The value of the test case with Mozilla and camera resolution 13 mp is 93.89
- ☐ The value of the test case with Google Chrome and camera resolution 13 mp is 96.67
- ☐ The value of the test case with Mozilla and camera resolution 8 mp is 57.22
- ☐ The value of the test case with Google Chrome and camera resolution 8 mp is 69.44
- ☐ The value of the test case with Mozilla and camera resolution 5 mp is 10.56
- ☐ The value of the test case with Google Chrome and camera resolution 5 mp is 7.22

Of the six values above, there are only 4 test cases that have values above 50, a test case that uses a camera resolution of 13 mp and 8 mp, using Mozilla and Google Chrome, scan distance 15 cm and scanned perpendicular to 90^0.

5.   Test Analysis Results

After getting the test results from the 6 test groups above, it was found that the environment can help e-label batik application has a good performance is as follows:

1.   For speed information display performance
   - ☐ The scan position is perpendicular to 90^0 with distance 5 cm, with Mozilla or Google Chrome web browsers and camera resolution to scan is 5 mp or 8 mp or 13 mp.
   - ☐ The scan position is perpendicular to 90^0 with distance 15 cm, with Mozilla or Google Chrome web browser and use a camera resolution of 13 mp
   - ☐ The scan position is perpendicular to 90^0 with distance 15 cm, use Google Chrome web browser and use a camera resolution of 8 mp.
   - ☐ If the scan position is tilted, it should be taken from a slope of 45^0 with distance 15 cm by using Google Chrome web browser and the camera resolution to scan is 5 mp or 8 mp or 13 mp.

2.   For clarity information display performance
   - ☐ The scan position is perpendicular to 90^0 by choice distance 5 cm or 10 cm, with Mozilla or Google Chrome web browsers and camera resolution for scanning is 5 mp or 8 mp or 13 mp.
   - ☐ The scan position is perpendicular to 90^0 with distance 15 cm, with Mozilla or Google Chrome web browsers and camera resolution for scanning is 5 mp or 8 mp or 13 mp.
   - ☐ If the scan position is tilted, it should be taken from a slope of 45^0 with distance 15 cm, with Mozilla or Google Chrome web browsers and camera resolution for scanning is 5 mp or 8 mp or 13 mp.

6.   Conclusion

1.   So that the performance of the e-label batik application is optimal in terms of speed display information and clarity of the information displayed, then the ideal environment is:
   - ☐ The scan position is perpendicular to 90^0 by choice 5 cm or 15 cm distance, with Mozilla or Google Chrome web browsers dan camera resolution for scanning is 8 mp or 13 mp.
   - ☐ The scan position is tilted from a slope of 45^0 with distance 15 cm with Google Chrome and camera resolution for scanning is 5 mp or 8 mp or 13 mp

2.   To get even better performance, it might change AR.js library used by the e-label batik applications

7.   References

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