Strengthening the Competitiveness of Micro-Businesses Based on Local Wisdom Through Digital Tourism Education Collaboration

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Abstract

The main purpose of this study is to provide model of micro business competitiveness based on digital tourism education collaboration. The strengthening of Bogor Batik Small Business Competition really requires innovation and creativity of Bogor Batik entrepreneurs to increase the scale of their business. This effort made to improve the business by collaborating with Bogor Batik as local wisdom, digital media and education, with the hope of increasing the scale of the Batik gallery. The potential of Bogor Batik as local wisdom collaborated with digital media will provide a special attraction for tourists, besides educational collaboration combined with digital-based local wisdom which is innovation and creativity of Bogor Batik entrepreneurs will introduce this to students and tourists so that this will increase the business competence of Bogor Batik. The method used in strengthening small businesses in Bogor Batik is to collaborate with smartphone-based digital media in the form of games and Augmented Reality (AR) applications of Batik Bogor combined with education. Thus, it is expected to help promote Bogor Batik and provide education about Bogor Batik itself. So, the Bogor Batik small business activities can compete with other batik small businesses.

Keywords:  
Augmented Reality, Education-tourism, Games, Local wisdom, Micro business.

1. Introduction

Small businesses based on local wisdom are small businesses that do business by selling services or goods in the form of cultural heritage that can make a major contribution to regional income and contribute to preserving culture (Anggraini, 2017; Tosida et al., 2017). One of the small businesses based on local wisdom in Bogor is the Dayatri Batik Gallery, Bogor, West Java, Indonesia. Dayatri batik gallery is a small business that sells goods in the form of Bogor Batik which has difficulty increasing business because it is influenced by many factors namely the production process is still done manually, so that the capacity of this equipment is highly dependent on the number of orders and the ability of existing workers. In process control which is also done manually, is carried out directly by inconsistent owners, as well as inconsistent promotional activities and not attracting public attention making Dayatri batik geleri very difficult to develop. In addition, Dayatri Batik Management is still very conventional, not yet supported by good production planning, because dominance relies on orders. Bookkeeping and financial management systems are still mixed with household finances, so there is no audit process, only written on sheets of paper that are not neat, redundant, scattered and even lost (Ardiansyah et al., 2020; Chang et al., 2012; Dahliani, 2015; Peng et al., 2013). This
conventional management pattern results in the immeasurable natural advantages and disadvantages of this business. Likewise with the batik motif design process that still follows the Bogor Batik trend, monotonous and not unique.

The strengthening of Bogor Batik small business competition really requires innovation and creativity of Bogor Batik entrepreneurs to increase the scale of their business. This is one of the reasons for the lack of orders for Bogor Batik on the number of Bogor Batik production. Bogor Batik gallery efforts to be able to survive and remain a batik gallery that contributes to regional income and preserving culture, especially the local wisdom of Bogor by making innovations to increase the production of Bogor Batik is to increase orders for Bogor Batik at Dayatri batik galleries. These innovations can be in the form of promotions through digital media, print media and other means so that the Dayatri batik gallery can survive and continue to contribute to regional income and preserve culture, especially the local wisdom of Bogor (Alavi, Maryam, E. Leidner, 2016; Ungerman et al., 2018).

Marketing is done by order or there are occasional buyers who come directly to the gallery. Batik Dayatri is less aggressive in marketing techniques as evidenced by the number of batik cloth products that are outdated, not absorbed by consumers, and relationships are still very limited. The selling price of batik cloth especially handmade batik is very high, but it is not supported by unique and attractive designs, resulting in low profits achieved by Dayatri Batik. Moreover, very tight competition between fellow Bogor Batik producers in the City of Bogor (Ungerman et al., 2018; Urh et al., 2015) resulting in Dayatri Batik getting worse. Marketing is done by order or there are occasional buyers who come directly to the gallery. Batik Dayatri is less aggressive in marketing techniques as evidenced by the number of batik cloth products that are outdated, not absorbed by consumers, and relationships are still very limited. The selling price of batik cloth especially handmade batik is very high, but it is not supported by unique and attractive designs, resulting in low profits achieved by Dayatri Batik. Moreover, very tight competition between fellow Bogor Batik producers in the City of Bogor, resulting in Dayatri Batik getting worse. (Plass et al., 2015; Reiners et al., 2015; Udjaja et al., 2018)

In this research, innovation in introducing Bogor Batik is through information technology through smartphone-based educational games and educational-based Augmented Reality Portals called educational collaboration with tourism activities. This activities can be claimed as an answer to the challenge of eductional in Industry 4.0 era (Tosida et al., 2020). This innovation can be generated by start up and telematics small medium enterprises (SMEs) who will increased and empowered to produce the educational game (Tosida et al., 2019).

Educational games and Augmented Reality Portals built on Android-based smartphones with the aim to promote and introduce Bogor Batik motifs and foster interest in learning the culture of batik to the community, especially millennial generation. So it is hoped that the collaboration of this activity can provide a positive effect on increasing the strengthening of the Dayatri Batik gallery to continue to survive in contributing to regional income and preserving culture, especially the local wisdom of Bogor.

2. Research Methodology

The object being analyzed

Small businesses that are used as research objects in carrying out innovative promotions to the introduction of batik galleries in order to stay afloat contribute to regional income and preserving culture, especially local wisdom Bogor are Dayatri batik galleries, because Dayatri batik galleries have difficulty increasing business (Plass et al., 2015; Shahroom et al., 2018).

Steps of research

The steps taken during the study are broken down as follows:

Stage 1: Transfer of Dayatri batik knowledge
The transfer of knowledge of Dayatri batik is done by interviewing the owner of the Dayatri batik gallery by finding information about Bogor Batik produced by the Dayatri batik gallery starting from the production, promotion and pattern of Bogor Batik produced by the Bogor Batik Gallery.

Stage 2: Information Data Processing
Information that has been received is processed to conceptualize tourism activities and educational activities so that it can attract the attention of Dayatri batik gallery visitors and provide education to millennials, so that the concept is obtained by building an interesting learning media by applying an Augmented Reality-based technology that allows users seem to be able to see the real form of batik motifs typical of Bogor Regency in 3D form through a mobile camera and build an interesting and interactive learning media by using the role playing game genre.
Stage 3: Building Smartphone Applications

Smartphone applications are built using the MDLC (Multimedia Development Live Cycle) method which consists of concepts, design, material collecting, design, testing, distribution. The detail of this stages are: 1) Concept stage is the stage to determine the objectives which include the objectives of the application including user identification (audience identification), application form (presentation, interactive, etc.), general specifications (application size, basic design, target to be achieved, and others); 2) Design is the stage of making software requirements specifications from the analysis stage to the design. Describe in detail the program architecture, appearance and material requirements for the program in order not to new decisions are needed at a later stage (material collecting and assembly) and using what has been determined at the design stage. Some designs at this stage include multimedia-based design, using Storyboard, navigation structure design, and Screen (User Interface) design; 3) Assembly stage (making) is the stage where all multimedia objects are created. Making an application based on a storyboard, flowchart interface, navigation structure or object diagram that comes from the design stage. In this stage several applications are used, such as Unity 3D, AR Core, and also Blender and the programming language used is C#; 4) The testing phase is done after completing the manufacturing phase and all data is entered. The system trials that will be carried out include structural trials, functional trials and validation trials; 5) Distribution is the last stage of the MDLC (Multimedia Development Life Cycle) flow. This stage can be called an evaluation stage for developing finished products in order to become better. The results of this evaluation can be used as input for the concept stage of the next product. At this stage the application is ready and successful in every trial will be compiled into the .apk format, the Android application format.

Stage 4: Application Eligibility Test

The application feasibility test was conducted to find out whether the collaboration application of tourism and education activities is feasible to be used in the Dayatri batik gallery. The feasibility test of the application uses the TELOS Method which consists of Technical, Economic, Legal, Operational, Schedule, because the higher the value of the feasibility factor of TELOS, the greater the application is feasible to be used on Dayatri batik (Hui Ling et al., 2019; Rahayu et al., 2019; Zgodavová et al., 2015). The details of this stage are: 1) Technical Feasibility Indicates whether the proposed system can be developed and implemented using existing technology or if new technology is needed; 2) Economic Feasibility Indicates whether sufficient funds are available to support the costs of the system proposed; 3) Legal Feasibility Indicates whether there is a conflict between the system under consideration and the company's ability to fulfill its obligations; 4) Operational Feasibility Demonstrate whether the user procedures and skills are sufficient for operating the proposed system or whether additional procedures and skills will be provided. Operational feasibility is measured using the PIECES framework which consists of five factors namely Performance, Information, Economy, Control, Service; 5) Feasibility Schedule The proposed system must be valid within a logical time frame.

3. Discussion result

3.1 Result Of Application

The application generated in accordance with the data generated from the interview process with Dayatri Batik gallery owners and respondents through questionnaires produced some input in the process of making applications with the concept of tourism activities and educational activities. The application design concept shows in Table 1 and Figure 1.

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type Of Application</td>
<td>Role Playing Game (RPG) and Augmented Reality</td>
</tr>
<tr>
<td>Audience</td>
<td>Public</td>
</tr>
<tr>
<td>Audio</td>
<td>.wav and .ogg</td>
</tr>
<tr>
<td>Video</td>
<td>.Webm</td>
</tr>
<tr>
<td>Application</td>
<td>Interactive game using Smartphone Android</td>
</tr>
</tbody>
</table>
3.2 Application Feasibility Test

To determine the appropriateness of applications made for Dayatri Batik using the TELOS method namely Technical, Economic, Legal, Operational, Schedule.

3.2.1 Technical Feasibility Test

The technical feasibility test was carried out twice, namely testing for RPG games and testing for AR applications.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specification</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minimal PC Hardware</td>
<td>rpg based educational game for introduction to batik motifs kab. this bogor can at least be run on laptop device with 2 GB of memory with the result of moving to several folders which is sometimes, whereas on pc devices with 4 - 8 GB of memory all went smoothly from the folder transfer.</td>
</tr>
<tr>
<td></td>
<td>Processor : AMD A6- 6400K APU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With Radeon(tm) HD Graphics CPU 4.1GHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Memory : 4GB RAM</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Minimal Smartphone Hardware</td>
<td>smartphones with minimum specifications run a little slowly when opening the history page, video and AR portal</td>
</tr>
<tr>
<td></td>
<td>CPU Octa-core 1.9GHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RAM 3 GB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Camera 16MP</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Operating System for PC</td>
<td>Application Running Well</td>
</tr>
<tr>
<td></td>
<td>Windows 10 and Windows 7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Operating System for Smartphone</td>
<td>Application will Running for nouget version or higher.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on the technical specifications of Batik RPG and Batik Portal AR applications and Beta test results, these application can be applied using technology that is already in general use, so the technical feasibility value is 9.5.

3.2.2 Economic Feasibility Test

Based on global calculations to apply the game application and AR batik application costs around Rp. 10 million. The fee includes training / workshops in the first year. For the next second year it is estimated to require a budget of approximately 2 million. The budget is used for maintenance costs and operator fee for RPG and AR batik game operators. Based on this, economic value can be given a value of 8.

3.2.3 Legal Due Diligence

RPG and Protal AR batik games are built using software that is "open source" and paid. The application to be implemented does not violate the law. Based on the legal feasibility analysis conducted, the value of legal feasibility in the application can be given with a value of 7.
3.2.4 Operational Feasibility Test

Operational feasibility tests are measured using the PIECES framework and questionnaire.

3.2.4.1 PIECES

3.2.4.1.1 Performance

Batik RPG applications can be used well on PC computers with a minimum specification that has been determined, while the AR Batik application can be used using a smartphone with an Android Nougat operating system. By using these two minimum specifications both applications can work well. It was proven by an experiment to find out whether the function of each button or menu in batik RPG and Portal AR games can function properly. Based on the trials that have been carried out, the overall buttons or menus on each folder can function and run accordingly.

3.2.4.1.2 Information,

The application of batik motifs in the batik RPG and Portal AR game applications provides information to users so that the RPG and AR batik game application users can find out the types and motifs of batik easily. So based on factor information analysis, the RPG and AR batik application can provide information and features needed by the community and batik producers.

3.2.4.1.3 The economy

3.2.4.1.3.1 Cost Component

Application Procurement Fee

This is the cost required to procure a supporting system for a system and because the infrastructure is available there is no need for infrastructure procurement costs

Application Application Fee

This is the cost used to use the application that is to easily download the application, the application is stored on the Playstore at a cost in accordance with the price on the Playstore which is approximately $25.

3.2.4.1.3.2 Benefits Component

Tangible Benefits

The tangible benefit of using this application is that the Dayatri Batik Gallery does not need to print batik promotion media so as to reduce the cost of promotion on the Dayatri Batik Gallery.

Intangible Benefits

Dayatri Batik gallery can contribute to and preserve culture, especially the local wisdom of Bogor.

3.2.4.1.3 Control

This application can control the activities of users and Dayatri batik owners can find out the number of application users so that gallery owners can monitor it.

3.2.4.1.3 Service

In this application there is a help menu to find out how to use the application so that each user easily uses and plays RPG and Batik game applications.

3.2.4.2 Questionnaire

In addition to using the PIECES framework, to measure operational feasibility a survey was conducted on several related respondents. Testing the feasibility of the results of the questionnaire data obtained based on the feasibility scale according to Arikunto on the recapitulation of the feasibility of using the Batik RPG and Portal AR game applications. This questionnaire distributed to 100 respondents, and the summary showed in Table 3.

<table>
<thead>
<tr>
<th>Num. of Responden</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>X5</th>
<th>X6</th>
<th>X7</th>
<th>X8</th>
<th>X9</th>
<th>X10</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>86</td>
<td>82</td>
<td>91</td>
<td>88</td>
<td>8</td>
<td>86</td>
<td>83</td>
<td>87</td>
<td>87</td>
<td>88</td>
</tr>
</tbody>
</table>

X(i) = Questions
Based on the results of the questionnaire the feasibility of using an Batik RPG and Portal AR application, was obtained, and total average as follows:

\[
Result = \frac{86 + 82 + 91 + 88 + 84 + 86 + 83 + 87 + 88}{10} = \frac{862}{10} = 86.2
\]

From the results of these calculations it can be concluded that the Batik RPG and Portal AR game applications are very feasible to use or apply. Based on the results of measurement of the PIESCES framework and the eligibility questionnaire of using the RPG and Batik game applications, then a score of 9 can be given.

### 3.2.5 Eligibility Schedule

The application to be implemented is not a complex application, so the application does not require a long time, and the total development time is measured in hours, days, weeks so that the estimation error is small. Based on this, the assessment for the feasibility of the schedule / time is 9.

### 3.3 TELOS Rating

The assessment of the TELOS factor is done by adding up all the values of the TELOS factor, then divided by the number of TELOS factors.

\[
TELOS value = \frac{Technical + Economu + Law + Operasional + Schedule}{5}
\]

\[
Nilai Telos = \frac{9.5 + 8 + 7 + 9 + 9}{5} = \frac{40}{5} = 8.5
\]

Thus it can be concluded that the application of Batik RPG and Portal AR games based on collaboration between tourism and education activities is feasible to be developed and applied to the Dayatri Batik Gallery with an average worth of more than 5, so that it is expected that the applications that have been made can strengthen the existence and sustainability of the batik gallery Dayatri to continue to survive in contributing to regional income and preserving culture, especially the local wisdom of Bogor.

### 4. Conclusion

Small businesses based on local wisdom are small businesses that do business by selling services or goods in the form of cultural heritage that can make a major contribution to regional income and contribute to preserving culture. One of the small businesses based on local wisdom in Bogor is the Dayatri Batik Gallery Bogor. This is a small business that sells goods in the form of Bogor Batik which has difficulty increasing business because it is influenced by many factors. The results of a survey conducted on 102 respondents still show that more than 67.9% of respondents answered incorrectly or did not know the typical batik of Bogor Regency. This is one of the reasons for the lack of orders for Bogor batik on the number of Bogor Batik production. In this research, innovation in introducing Bogor Batik is through information technology especially smartphone-based educational games and educational-based RPG and Portal AR called educational collaboration with tourism activities. This educational RPG and Portal AR that are built on Android-based smartphones with TELOS testing. Thus it can be concluded that the application of Batik RPG and Portal AR based on collaboration between tourism and education activities is feasible to be developed and applied to the Dayatri Batik Gallery with an average value of more than 5. So that it is expected that the applications that have been made can strengthen the existence and sustainability of the Dayatri Batik Gallery to continue to survive in contributing to regional income and preserving culture, especially the local wisdom of Bogor, Indonesia.

### References

Alavi, Maryam, E. Leidner, D. (2016). Foundations and Research Issues Linked references are available on JSTOR for this article: REVIEW: KNOWLEDGE MANAGEMENT AND KNOWLEDGE MANAGEMENT SYSTEMS: CONCEPTUAL FOUNDATIONS AND. *Management Information Systems Research Center,*


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