

Developing Special Product Development Models

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Abstract

This development research aims to develop a customized product development model with a content structure: Model Name, Framework, and Procedure (explanation of steps in the Framework). This Development Research uses a Design-Based Research Model with the steps: 1. Identification of Problems and Needs, 2. Identification of Goals, 3. Artifact Design and Development, 4. Artifact Test, 5. Artifact Test Evaluation, 6. Artifact Communication. Data were collected through interviews and questionnaires and were processed using descriptive statistics. Development Research succeeded in developing a custom product development model (Customized) which was later named the Collaborative Model, along with a Framework and Explanation of Research and Development Procedures to be carried out. Collaborative Model: Customized Product Development Model was developed only from the identification of problems and needs of a special product development model for the academic community of one university in Malang. It is suggested to the next researcher to develop a development model for specific products that begins with identifying the problems and needs of academics from many tertiary institutions. Collaborative Model: Customized Product Development Model is used by experimenters to conduct research and development. The pilots stated that the model was very effective. Collaborative Model: Customized Product Development Model will be very useful, considering that there is no similar model in Indonesia that is easy to understand and speaks Indonesian.

Keywords: *Model, Development, Special Products.*

INTRODUCTION

The facts show that there are still many academicians who are confused about conducting research and development to produce customized products. They are confused about choosing the right “development model”. So it often happens that they want to develop a special product but use the development model to produce mass products.

It is very risky. The worst risk is that the resulting product is not relevant to the needs so it is not useful for the user. Of course, this is a waste. Because researchers have sacrificed a lot of cost, effort, and time.

The special product development model is certainly different from the mass product development model. As an analogy clothes are made by boutique products and clothes is made by convection products.

Boutique product clothing is aimed at specific individuals. Meanwhile, convection clothing products are intended for the general public.

Tailors at a convection company cut the fabric to be sewn into clothes in sizes S, M, L, and or XL. Once cutting the cloth, the tailor can stack 10 or even 15 pieces of cloth and cut simultaneously for clothes of the same size. To be further sewn and marketed to the target market.

Unlike the way boutique tailors work. Boutique tailors will only cut the fabric according

to the body size of the customer. Therefore, boutique tailors can't mass-produce clothes. Because clothes are only relatively suitable/fit the customer. (Purwiyanto, 2018).

Based on the background above, the researcher is interested in conducting development research with the title "Developing Customized Product Development Models (Customized)".

RESEARCH METHODS

This research uses the Development Research approach. The development model used is Design Based Research with the following steps:

1. Identification of problems and needs, 2. Identification of objectives, 3. Design and development of artifacts, 4. Artifact testing, 5. Evaluation of artifact test results, 6. Artifact communication

Development Research Procedures

The procedure or steps for developing research with the Design Based Research model are as follows:

Step 1, identify problems and needs. Identification of problems and needs can be done by conducting interviews and distributing questionnaires. Interviews with respondents are intended to deepen the findings of the problems obtained from the questionnaire.

Step 2, identify goals. Researchers formulate research objectives that must be consistent with the results of problem identification. If the formulation of research objectives is not clear, it will complicate the product development process.

Step 3, preparation of design and development of artifacts (products). Broadly speaking, the procedures that must be carried out by researchers at this stage include::

- a. Artifact (product) design development. Artifact (product) design development takes a lot of time because this stage is the main activity before the design is validated by collaborative groups and experts who are then tested in real terms in the field.
- b. Collaborative group validation. Collaborative group validation is intended to obtain inputs so that the product design conforms to the expected specifications.
- c. Expert validation. Expert validation is also intended to obtain input so that the product design is following the expected specifications. There are two ways that researchers can do to validate experts, namely through Focus Group Discussion (FGD) or Dhelphi. In this study, the researcher chose the Dhelphi technique by giving questionnaires to experts to respond to product designs. Categorized as experts in this study are those with qualifications at the S-3 (Doctoral) level of education and already have an academic position of at least Lector Head, accustomed to conducting development research.
- d. Revision of products following directions, input, and criticism from collaboration groups and expert teams.

Step 4, test the design artifact (product). Product design testing is a very important part of development research. The design test is carried out after the product design has been validated by the collaborative group and a team of experts. The validation of collaborative groups and expert teams is intended to determine the theoretical feasibility of the product. While the product design test aims to determine whether the product being developed has practical feasibility.

Step 5, evaluate the design test results. Evaluation is the stage where the process of revising the artifact (product) design is carried out by researchers based on criticism and suggestions received by researchers from product trials in the field.

Step 6, product communication. Products that have been declared effective and suitable for use

need to be communicated and disseminated. Dissemination can be through publication in scientific journals, seminars, published as books, workshops, and others.

Furthermore, the data collected is adjusted to the needs, that is qualitative data, namely the problems faced by users, and data collected in the form of criticism, suggestions, and input from collaborative groups and experts. Also, data were obtained during product trials.

Quantitative data, namely the scores given by the validators (collaboration groups, expert teams, and trial subjects). To obtain data, researchers used a questionnaire instrument and conducted interviews. Furthermore, the collected data were analyzed using descriptive statistics. The results of data analysis are used as a basis for making decisions, whether the product design is feasible or needs to be revised. To determine the level of product feasibility, calculations are carried out with the following formula:

$$\text{Score} = \frac{SV_1 + SV_2 + \dots + SV_n}{SI \times n} \times 100\% \dots\dots\dots \text{Purwiyanto (2018)}$$

Description:

SV_1 : Validator score I

SV_2 : Validator score II

SV_n : Validator score to- n

n : Number validators

SI : The ideal score of each validator

Furthermore, the score obtained is confirmed on the effectiveness interval line as follows:

0-25	26-50	51-75	76-100
Less effective	Effective Enough	Effectiv	Very effective

..... Source: Purwiyanto (2018)

RESULT AND DISCUSSION

A. Identification of Problems and Needs

1. Identification of Problems and Needs by Researchers

The researcher conducted a literature study and interviews with the STIE "ABC" academic community regarding problems that students and lecturers often complain about when conducting research and development to produce special products. They stated that it was difficult to get literature on specific product development models. So they used other models, , for example, the Sugiyono Model (the model written

in Sugiyono's book). Even though it has been explained in Sugiyono's book that the development model will produce mass products.

For example, research conducted by FAP with the title *Research and Development of Promotion Management Quality Systems in MSME Dorowati Aluminum Lawang Malang*. Also, research was conducted by EAP with the title *Research and Development of Production Quality Systems at Convection Nusantara T-Shirt Production*.

Observing the title of their research, it can be assumed that the researcher aims to develop a special product that is designed to be suitable/relevant only for the organization where the

research is conducted. It should also be noted that the research they carry out is under the guidance of a supervisor appointed by the head of the study program.

In addition, research by EN. He is also a student at the "ABC" College of Economics. EN's research entitled Research and Development of Financial Accounting Management Quality Systems and Financial Management at UD Besi Barokah, Turen, Malang Regency. Judging by the title, this research aims to produce a special product. But in its development, the researcher used the Borg and Gall model, a development model used to develop mass products. EN research is also research to compile a thesis under the guidance of a supervisor. One student stated the following.

"Our college vision is The Quality System Resources. To support the achievement of the vision that has been set, each student's research is directed at research and development, namely developing a quality management system for an MSME. However, what my friends and I generally struggle with is finding literature on custom product development models. There is still no Indonesian language literature" (EN, student majoring in Accounting, STIE ABC).

Another student stated, "I honestly have a hard time finding specific product development model literature. When I chose and used the Model as written in Sugiyono's book, thank God, my supervisor my thesis is not complaining ". (FAB, student majoring in Management, STIE ABC).

Meanwhile, a lecturer stated, "I have conducted research using a Research and Development approach to produce a special product. I'm using the Borg and Gall Development Model. Because I couldn't find a model that was specifically developed to develop a specific product" (XXX, lecturer in Management, STIE ABC).

Based on the results of the literature study and interviews in advance, it was possible to identify several problems faced by students and lecturers of STIE "ABC", namely:

- a. Difficulty getting to the literature on specific product development models
- b. Literature on specific product development that is in Indonesian and easy to understand is not found.

From the findings of the problem, the researcher believes that there is an urgent need for the STIE "ABC" academic community, namely the availability of literature on specific product development models.

2. Problem and Need Identification Validation

For the identification of problems and needs that have been carried out by researchers, then the researchers asked for validation from the collaboration group, lecturers and students of STIE "ABC". They state the following.

"I am very pleased that this development research will result in a special product development model. Recalling STIE's "ABC" vision, the existence of a special product development model is urgently needed by students and lecturers. Apart from that, special product development models may also be needed by academics from other tertiary institutions and other researchers. (Collaborative group - Deputy Head of STIE "ABC").

"The existence of a special product development model will greatly help fellow students when conducting research and development. Considering that until now there is no Indonesian language literature on specific product development models. (EN, STIE student "ABC").

"Lecturers will be very happy if there is a model that can be used as a guide for developing special products. Because to achieve STIE's "ABC" vision, the lecturers' research should be directed there. While the literature related to the special product development model is still scarce. (Mr, lecturer at STIE "ABC").

3. Validated Problems and Needs

After the researcher asked for validation from the collaboration group, lecturers, and

students of STIE "ABC" on the identified problems and needs, the problems and needs in this development research could be formulated: there is no specific product development model that is urgently needed by lecturers and students.

B. Goal Formulation

Based on validated problems and needs, namely the absence of a special product development model that is needed by lecturers and students, this development research aims to provide solutions to problems that arise by developing a special product development model.

C. Artifact Design (Product)

The researcher designed the product according to the expected product development product specifications.

D. Artifact Test (Product)

1. Theoretical Effectiveness Test

To find out the effectiveness and theoretical feasibility, the design of the artifact (product) was validated by a collaborative group consisting of lecturers and structural officials of STIE "ABC". The Collaborative Group consists of: a. Head of LPPM, Mohammad Rofiudin, SE., MM., as validator I, b. Chairman of UPM, Dr. dr. Anis Dwiastanti, MM., as validator II, and c. Puji Lestari, SE., MM, as validator III. While the Expert Team consists of: a. Dr. Sunaryanto, M.Ed., b. Dr. H. Sultoni Fadil, M.Pd., and c. Dr. dr. Nanis Hairunisa, MM.

The average score of the Collaborative Group validator is 80%. After being confirmed with the effectiveness interval line, the score is in the Very Effective interval. Thus it can be concluded that theoretically according to the Product Design Collaboration Group (Special Product Development Model) is very effective so it is feasible to use.

While the average score of the expert validator is 95%. If confirmed by the effectiveness interval line, the score is in the Very Effective interval. Thus it can be concluded that theoretically according to the Expert Team, the product design (Special Product Development Model) is very effective so it is feasible to use.

Various directions, inputs, and criticisms from collaboration groups and expert teams on the design of specific product development models are as follows.

- a. M. Rofiudin, SE., MM., commented that the Collaborative Model framework is more implementable.
- b. Dr. dr. Anis Dwiastanti, MM, commented that this model can be applied to specific product research and development activities).
- c. Puji Lestari, SE., MM., commented that the model needs to be given.
- d. Dr. Sunaryanto, M.Ed. commented that this development procedure should be Open Loop, because if it turns out that the product does not meet the user's requirements, then it is possible to go back to the first step. Based on this direction, the researcher said that to avoid products that do not meet user needs, this model always involves users at every stage of development.
- e. Dr. H. Sultoni Fadil, M.Pd. commented so that the picture is clearer, each stage should include the title of the stage at the same time. For this direction, the researcher said that to get around the limited space, each stage title was explained separately next to the picture.
- f. Dr. dr. Nanis Hairunisa, MM. commented that the visual appearance was attempted to be better. This direction was accepted and the researcher made the model's visual appearance better and more attractive.

Based on various inputs and criticisms from the Collaboration Group and the Expert Team, the researchers made improvements to the product design so that a post-validation product was obtained.

2. Practical Effectiveness Test

Products that theoretically have good eligibility (validation results of the Collaboration Group and Expert Team) need to be tested for their effectiveness in real terms in the field by conducting trials. Some things that need to be reported during product trials are as follows.

a. Experimenter.

- 1) Cakra Yudha Bhakti conducted research with the title Research and Development of Accounting Management Quality Systems in Cactus Advertising Malang. This study aims to produce a Management Accounting Quality System specifically designed for Cactus Advertising Malang.
- 2) Muhammad Ali Rif'an Djamsari conducted research with the title Research and Development of Accounting Management Quality Systems in UMKM Koi Gatutkoco Bululawang Malang Regency. This study aims to produce a Quality Management Accounting System for UMKM Koi Gatotkoco, Malang.

E. Evaluation of Artifact Test Results

After conducting the trial, the experimenter gives a score to the product. The average score of the experimenters was 92.50%. If confirmed with the effectiveness interval, the score is in the Very Effective interval. Thus it can be concluded that practically, the product (Special Product Development Model) is very effective so it is feasible to use.

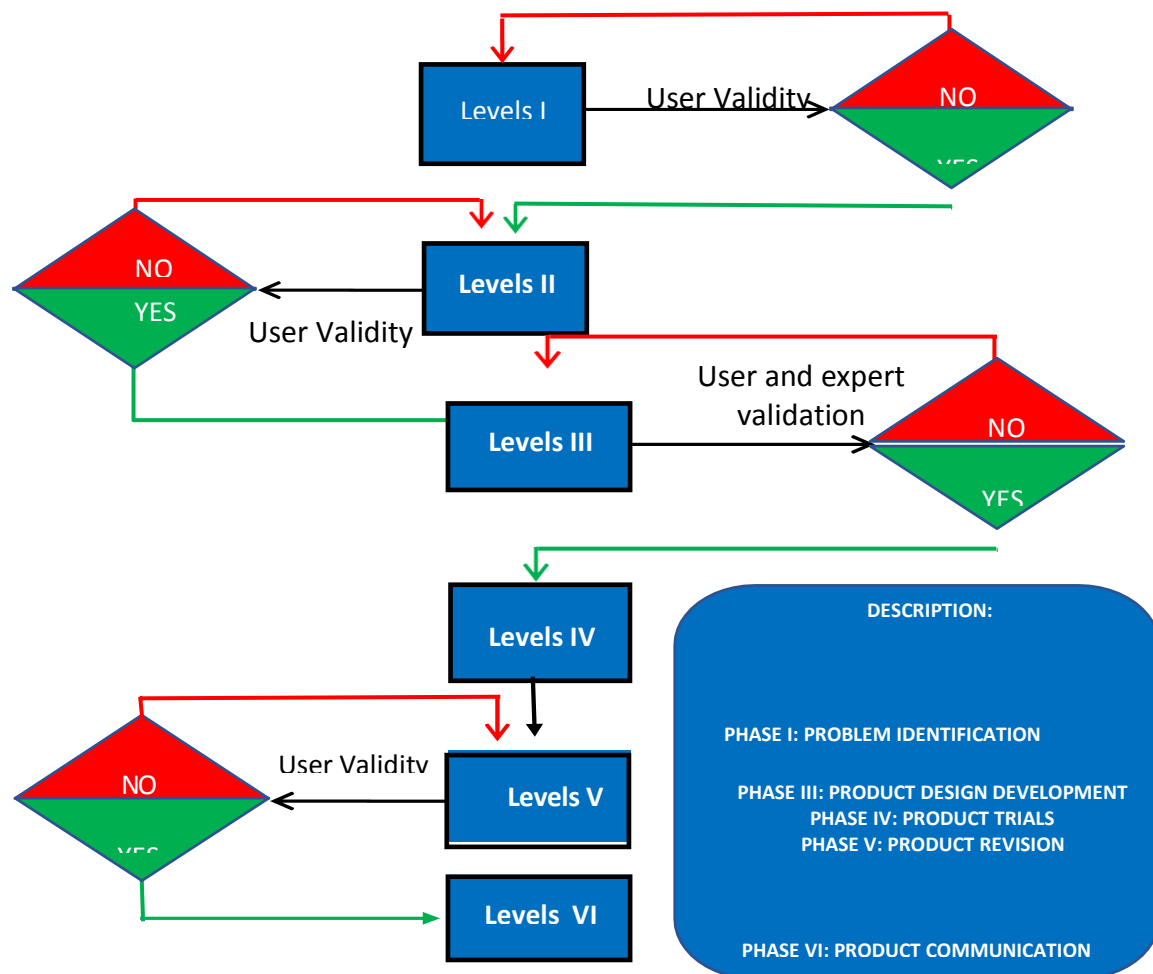
In addition to giving a score, the experimenters also commented on the design of the specific product development model. The 1st pilot (Cakra Yudha Bhakti) commented that the Collaborative Model makes it easier for researchers to identify problems. This is due to the collaboration between researchers and users. There are no criticisms and suggestions that can be used as material for revising the product. Whereas from the 2nd pilot (Muhammad Ali Rif'an Djamsari) there were no comments, criticisms, or suggestions. Therefore, until this stage, the product development is declared complete. The post-validation product from the collaboration group and expert team is declared as the final product with the name *COLLABORATIVE MODEL*.

F. Artifact Communication (Product)

The final stage of this development research is the communication and dissemination of the Collaborative Model: Custom Product Development Model. Some techniques that researchers can do include: publication in scientific journals, seminars on results with STIE "ABC" academic audiences, publishing the resulting product development into a book, and national seminars on Collaborative Models:

Special Product Development Model with researchers as resource persons. Comprehensively the development results are as follows.

Framework of COLLABORATIVE MODEL: Custom Product Development Models



Research and development procedures using the Collaborative Model are as follows.

1. Phase I, problem identification.
 - a. Problem identification by researchers. Researchers conducted interviews, observations, and documentation on research subjects to find problems faced by research subjects/product users.
 - b. Validation of problem identification by product users. The problem identified by the researcher is a user problem according to the researcher's perception which is not necessarily considered a problem by product users. Therefore researchers need to ask users for validation. In essence, this activity is carried out to assure that the problems that have been identified by researchers are also considered problems by users who must immediately get a solution.
 - c. Validated problem identification. If the user has agreed with the identification of the problem found by the researcher, then this is a real problem that must get a solution through product development.
2. Phase II, formulation of objectives.
 - a. Formulation of objectives by researchers. Based on the identification of validated problems, researchers formulate goals to provide solutions to the problems that occur.
 - b. Validation of the formulation of goals by the user. The goals that have been formulated by researchers are goals according to the perception of researchers that are not necessarily considered goals by product users. Therefore, researchers need to ask users for validation. In

essence, this activity is carried out to guarantee that the goals that have been formulated by researchers are also goals according to users that must be realized immediately to provide solutions to problems that occur.

- c. Validated goal formulation. If the user has agreed with the goals formulated by the researcher, then this is the real goal that must be realized immediately so that the problems that occur immediately get a solution.
3. Stage III, product design development.
 - a. At this stage, researchers develop products with specifications that suit user needs. The product design developed at this stage is often referred to as the initial product.
 - b. Product design validation. Product design validation must be performed. First, to the user. This is to guarantee that the product being developed is following the product characteristics required by the user. Second, expert validation. Expert validation is intended to assure that the theoretically developed product design is feasible to provide solutions to the problems that occur.

Some of the possibilities that occur during product validation are:

- 1) Users state that the product developed by the researcher does not meet their needs.
- 2) Users state that the product developed by the researcher meets their needs.
- 3) Some experts or all of them state that theoretically, the products developed by researchers are not feasible or able to provide solutions to the problems faced by users. If this happens, the researcher should collect all validators and pack them in a discussion. This is intended to get various inputs from the validator about the product that must be developed. Furthermore, various inputs from the validator are used as materials to improve the product design being developed. Then improvements were made until all validators stated that the product design being developed was feasible. Product designs that have received a proper assessment by all validators are called post-validation products.
4. Phase IV, product trials. Experiments were carried out to empirically determine the feasibility or effectiveness of the product. Because the feasibility and effectiveness obtained from the previous validators are still at the theoretical level. During the trial, the researcher observed and recorded all criticism, comments and suggestions from the test subjects as a basis for revising the product.
5. Stage V, product revision. All criticism, comments, and suggestions from test subjects during product trials are used as material for product revision. The revised product is then requested for validation by the user. Product revision validation is carried out until the user states that the product has been approved as needed. When the user states that the product is following the requirements, then the revised product is a finished product.

Stage VI, product communication. At this stage, the researcher's activity is communicating the product to users. The researcher conveys to the user that the product development has been completed. If users find it difficult to use the product that has been developed, the researcher must be prepared to provide training or workshops on how to use the product.

CONCLUSION

Product Strength. Collaborative Model: Customized Product Development Model has the following strengths/advantages. It is theoretically feasible by getting validation from a collaboration group and a team of experts from well-known universities in Malang. Practically feasible. Collaborative Model: Customized Product Development Model is used by experimenters to conduct research and development. The pilots stated that the model was very effective. Collaborative Model: Customized Product Development Model will be very useful,

considering that there is no similar model in Indonesia that is easy to understand and speaks Indonesian. Product Restrictions. Collaborative Model: Customized Product Development Model was developed only from identifying problems and needs of the academic community from one tertiary institution in Malang. It is suggested to the next researcher to develop a special product development model that begins with identifying the problems and needs of academics from many tertiary institutions

REFERENCES

- Barab, S., & Squire, K., 2004, Design Based Research: Putting a Stake in the Ground, *The Journal of the Learning Sciences*, 13 (1) Pp. 1-14.
- Borg and Gall. 1983, *Educational Research, An Introduction*, New York and London, Longman In.
- Budiman, Ilham, dkk. 2021, Analisis Pengendalian Mutu di Bidang Industri Makanan, *Jurnal Inovasi Penelitian*, Vol. 1 No. 10 Maret 2021, ISSN (online) 2722-9467.
- Christensen, G. Stanly, 1978, *Lamb;s Question and Answer on the Marine Diesel Engine*, London, Griffin.
- Collins, A., Joseph, D., & Bielaczyc, K. 2004, Design Research: Theoretical and Methodological Issues, *Journal of the Learning Sciences*, 13 (1), pp. 15-42
- Ellis, J., and Levy, Y., 2010, A Guide for Novice Researchers: *Design and Development Research Methods, Proceeding of Informing, Science and IT Education Conference (insite) 2010*, pp. 107-118
- Milles and Huberman, 1992, *Analisis Data Kualitatif*, Jakarta, UIP.
- Plomp T., 2013, *Educational Design Research: An Introduction*, Enschede: SLO Netherlands Institute for Curriculum Development.
- Purwiyanto, 2018, *Research and Development: Pengembangan Produk Customized*, Malang, Surya Pena Gemilang.
- Sugiyono, 2017, *Metode Penelitian Kuantitatif, Kualitatif dan R&D*, Bandung, Alfabeta.
- Sultoni, 2012, Pengembangan Model Pelatihan Motivasional Untuk Mengaktualisasikan Kompetensi Guru, *Disertasi*, Pasca Sarjana Universitas Negeri Malang.
- Sukmadinata, Nana Syaodih. 2008. *Metode Penelitian Pendidikan*. Bandung: Remaja Rosdakarya.
- The Design-Based Research Collective, 2003, Design-Based Research: An Emerging Paradigm for Educational Inquiry, *Educational Researcher*, Vol. 32 No. 1. Pp. 5-8. <http://digilib.uin-suka.ac.id/39153/1/SRI%20SUMARNI%20>