

# Development Model for Android-Based Bullet-Bulleted Obrain Styles

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**Abstract.** This study aims to develop an Android-based obrain style bullet gauge. The research method used is research and development which adopts from the theories of Borg and Gall which has 10 stages of development. The subjects were 20 male and female athletes. Data collection uses observation, questionnaire, interview and test. The data analysis technique used in this research is descriptive quantitative statistics. The average value of the results of small-scale trials with 8 subjects athletic athletes shot put number is 85.4% the category "Good" which means that the android-based shotgun gauge is "feasible" to be used as a style of shot putter obrain. So the average value of the results of large-scale group trial subjects 12 athletes athletes putting shot number 86.2% category "Good" which means that the Android-based obrain style shotgun gauge is "feasible" to be used as a gauge for shot put obrain style. The conclusion from this study is the Android-based obrain force bullet measurement test instrument is feasible to use to measure the results of obrain force shot put. The originality of this Ucok Distance Measuring (UDM) tool compared to the Alge Distance Measuring Devices (EDM) tool is that the UDM component is better by adding an android-based application and is more effective because the tool can be operated via an android smartphone.

**Keywords:** Android, Bullet Resistant, Measurement Model, Obrain

## 1 Introduction

As the development of sport science, the field of sports has changed to become very technical, challenging scientists and coaches in applying and practically applying their knowledge with the constant development of new technology. The terminology regarding technological objects for the purpose of facilitating or enhancing sports is not consistent. The term "sports technology" is used as a synonym for technical objects used for sports. Different from the more commonly used term "sports equipment", the concept of sports technology encompasses various objects which have a technology base [1]. Technology is philosophically defined as a physical instrument that can be used for problem solving [2]. A number of studies on technology in sports have previously been carried out such as: systematic reviews of global positioning systems (GPS) and micro sensor technology in team sports [3], reviews based on

motion analysis in sports [4], video usage in training [5], integrated technologies such as GPS, accelerometers and heart rate monitors in team sports [6].

At present, sports technology can be seen as part of the athlete's needs, enabling the integration of humans and objects and enabling the emergence of new discoveries through more specific analysis [7]. An interesting example of technological development taking place in sports through the application of innovative technology taken from other disciplines is the use of drones (unmanned camera sets) [8] [9]. These advances have made it possible for researchers and applied sports scientists to more easily measure key aspects of performance in the field, which often could only previously be done in a laboratory [10]. In addition to technology, athlete performance is also supported by good and tiered training. Performance and achievement of athletes must be trained to the maximum in order to get the best, this is reinforced by the opinion of James Tangkudung (2012: 63) that "achievement can only be achieved if coaching can be carried out and focused on aspects of training that fully include: athlete's personality, physical condition, technical measurement, tactical measurement and mental ability, these five aspects constitute a unified whole. 'Paralysis with analysis' is a general result that results from conscious control of a movement that is usually automatic, which is very likely caused by information overload and ongoing monitoring [11]. Therefore, a large number of studies have analyzed measurably differences in performance from year to year on throwing numbers in athletic sporting branches [12] [13] [14] [15].

One of the most prominent advances in the field of data collection and processing methods is the computer analysis system. Computer vision uses algorithms to detect identification features in video clips such as patterns or color differences [16]. A computer analysis system requires several cameras to be placed around a sports field, and can require manual input as a calibration of the game event [17]. Meanwhile, developments in the use of computer analysis technology to automate the capture of player movements continue with evaluations developed [4]. Evaluation is done by measuring students' physical fitness tests. For example, accurate player tracking data collection can be a problem when several players are collected in a small area [18] [5]. Slow-motion technology using computers also plays a role in the development of motion analysis in biomechanics and other sports sub-disciplines, with products such as Microsoft Kinect™ being used as a low-cost solution for analyzing motion [19].

The increasing distance from the throwing performance of athletes makes athletes in the athletics throwing branch realize that a more accurate and uniform device is needed to measure the distance from the throw. Finally, the development of distance measurement technology has developed rapidly. One technology that continues to develop in distance measuring devices in athletics is the Electronic measurement device (EDM). Electronic Distance Measurement (EDM), used in eight events in athletics: high jump, long jump, triple jump, pole jump, discus throwing, shot put, hammer throw, and javelin throwing. EDM tools during its development have been through many improvements to become a tool that has high precision as it is now [20].

The problem that currently exists in athletics, especially the number of throwing, is that there are still very few EDM tools owned by the PASSI organization at the provincial or district / city level in Indonesia. This certainly can affect the implementation of an athlete's training results especially when they want to take the shot put, because if using a manual test it will affect the results obtained are not accurate. In

addition, when a race event does not use accurate and digital measuring instruments, it can cause chaos because the results using manual measuring tools are not accurate.

Based on these problems, it is necessary to research the development of measuring devices with the aim that the resulting product will provide an easy and effective solution used to measure shot put skills. According to Seels and Richey in Ardani [21], development can be interpreted as a process of translating or describing design specifications into physical features. Tessmer and Richey state that development focuses not only on needs analysis but also on broad issues about initial analysis, such as contextual analysis [21]. The development of volleyball learning models produces product models learning [22]. The results of his research are the development of scoring applications in soccer games [11]. The results of his research on the development of service learning products for volleyball [23]. The results of his research are computer-based volleyball skills test instrument products [18].

Based on these problems, the researchers wanted to develop obrain style shotgun measuring devices based on Android. After this measuring device has been made and has been tested for the feasibility of the tool, it is expected that the shot gauge can be a solution to make it easier for athletes, coaches and sports teachers to evaluate the results of obrain-style shotguns.

## 2 Method

The research approach used in this research is research and development (Research and Development), with the reason because it is in accordance with the objectives to be achieved in the form of a development model for Android-based shotgun distance measurement tool.

The study was conducted at the East Jakarta Rawamangun Athletic Stadium with. The subjects of this study were 20 shot put athletes. The details are 17 male athletes and 3 female athletes. Data collection techniques in this study (1) observations of spaciousness where the research subjects were carried out, (2) interviews with trainers.

Observation was carried out to find out and observe the situation and its conditions regarding the instrument used and other supporting facilities at the research site. Researchers participate directly as a process of observing directly according to the circumstances in the field and Interviews were conducted with trainers

The instrument in this research development is to use several data collection instruments, including. According to Sugiyono, questionnaire is a data collection technique by giving written questions to respondents to be answered. Questionnaire can be a closed / open question / statement. According to Sugiyono, the types of questionnaires according to their shape are divided into three, viz. (1) Multiple choice questionnaire, (2) Check list. (3) Rating scale.

Data analysis includes all the activities of clarifying, analyzing, using and drawing conclusions from all data collected in action. Whereas quantitative data were obtained by giving a score on a qualitative based on a Likert scale that was converted to a scale value of 4. Percentage is intended to find out the status of something that is presented and presented as a percentage. The formula for calculating eligibility according to Sugiyono (2013) is as follows. The results of subsequent data calculations

are made in the form of a percentage multiplied by 100% and in the four categories of eligibility by using the Scale as follows. Percentage of Eligibility Category by Arikunto.

**Table 1.** Percentage of Eligibility

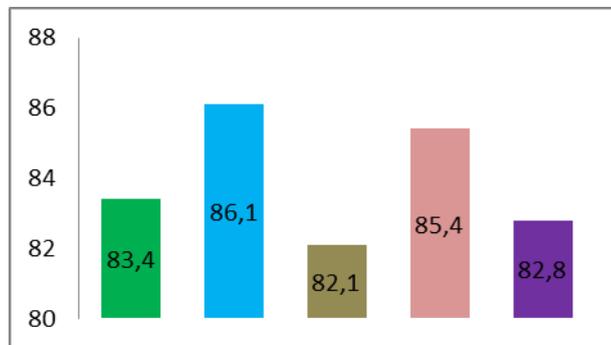
Score as a percentage	Eligibility Category
<40%	Not Good / Not Eligible
40%-55%	Poor / Inadequate
56%-75%	Good enough / decent enough
76%-100%	Good / Decent

Note: (1): Strongly disagree / very improper, (2): Not appropriate / not feasible, (3): Appropriate / feasible, (4): Very appropriate / very feasible

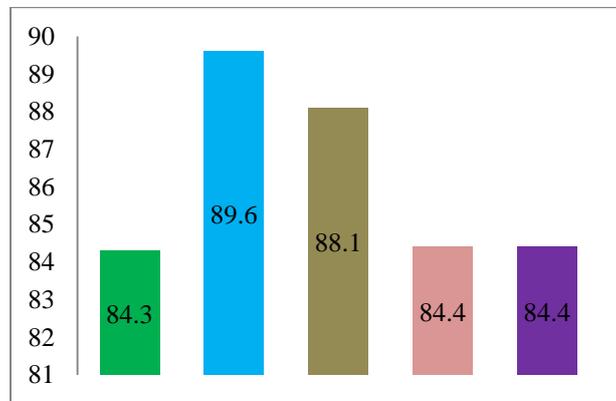
### 3 Result and Discussion

**Table 2.** Data on Small Scale Group Trial

No.	Aspect of Rating	Score Calculate	Percentage	Percentage	Categories
1	Aspect of Originality	87	96	84,3	Good / Decent
2	The Excellence Aspect of Innovation	124	144	86,1	Good / Decent
3	Usability Aspect	197	240	82,1	Good / Decent
4	Safety Aspects	123	144	85,4	Good / Decent
5	Aspect of Use	159	192	82,8	Good / Decent
<b>Total Skor</b>		<b>683</b>	<b>816</b>	<b>85,4</b>	Good / Decent



**Fig. 1.** Diagram of Small Scale Trial Results



**Fig. 2.** Diagram of Small Large Scale Trial Results

Based on the results of large-scale group trials in the diagram above that in the aspect of originality the android-based shotgun gauge obtained 83.4% in the "Good" category means that the android-based shotgun gauge is "feasible" to proceed to the stage of tool implementation. The superiority aspect of android-based shotgun measuring devices obtaining 86.1% in the "Good" category means that digital-based athletic measurement test kits are "feasible" to proceed to the stage of tool implementation. The aspect of the use of android-based shotgun measuring instruments obtains a score of 82.1% the category of "Good" means that the android-based shotgun gauge is "feasible" to proceed to the stage of tool implementation. The safety aspect of android-based shotgun measuring device scores 85.4% in the "Good" category, meaning that the android-based shotgun gauge is "feasible" to proceed to the stage of tool implementation. The aspect of using android-based shotgun measuring devices has a value of 87.5% in the category of "Good" meaning that the android-based shotgun gauge is "feasible" to proceed to the stage of tool implementation. So the average value of the results of large-scale group trials is 85.7% the category of "Good" which means that the android-based shotgun gauge is "feasible" to proceed to the stage of tool implementation.

Based on the results of a small trial in the diagram above that in the aspect of originality the android-based shotgun gauge has an 84.3% score in the "Good" category meaning that the android-based shotgun gauge is "feasible" to proceed to the large-scale trial phase after being corrected accordingly with the advice given. The excellence aspect of android-based shotgun measuring device scores 89.6% in the category of "Good" means that the digital-based athletic measurement measuring instrument is "feasible" to proceed to the large-scale trial phase after being corrected in accordance with the advice given. The aspect of the use of android-based shotgun gauges with a score of 88.1% in the category of "Good" means that android-based shotgun gauges are "feasible" to proceed to the large-scale trial phase after being corrected in accordance with the advice given. The safety aspect of android-based shotgun gauges is 84.4% in the "Good" category, meaning that android-based shotgun gauges are "feasible" to proceed to a large-scale trial after being corrected according to the advice given. The aspect of using an android-based shotgun gauge has an 84.4% score in the "Good" category meaning that an android-based shotgun gauge is "feasible" to pro-

ceed to a large-scale trial phase after being corrected in accordance with the advice given. So the average value of the results of small-scale trials is 86.2% the category of "Good" which means that the android-based shotgun gauge is "feasible" to proceed to the large-scale trial phase after being repaired.

**Table 3.** Data on Large Scale Group Trial Results

Aspect of Rating	Score Calculate	Percentage	Percentage	Categories
Aspect of Originality	87	96	84,3	Good / Decent
The Excellence Aspect of Innovation	124	144	86,1	Good / Decent
Usability Aspect	197	240	82,1	Good / Decent
<i>Safety Aspects</i>	123	144	85,4	Good / Decent
Aspect of Use	159	192	82,8	Good / Decent

This development research is based on the need that there are currently many members of the PASSI organization who do not yet have an Android-based throwing number measurement tool. So that the existence of this development product can be used by all elements and organizations of PASSI. This tool is named Ucock Distance Measuring (UDM). The Android-based obrain style shot gauge products are as follows:



**Fig. 3.** Ucock Disntance Measuring (UDM)

The novelty of this development research includes various aspects, in terms of technology used, in terms of the function of the tool, and the shape of the measuring instrument which certainly has a difference with the pre-existing measuring devices.

### 1. Novelty In Terms of Technology

**Table 4.** Compare the Types of Technology Used in Manufacturing Tools

<b>Alge Distance Measuring Devices (ADMD) (Theodolites)</b>	<b>Ucok Distance Measuring (UDM)</b>
Tripod	Tripod
Target	Microprocessor
Prismastic Reflector	Penahan Laser
Serial Cable	Laser
Null Modem/gender Changer	Scrup Penyambung Laser dan Penahan
Sighting Unit	Tombol pengukur
Battery Charger	Dudukan Peyambung Tripod
Battery	Led Android 14”

Based on a detailed table of the technology components used in making each measure above, there are many different types of components used. In terms of the price per unit component, of course, the UDM bullet gauge components are cheaper and easier to obtain. Then the most prominent thing is, UDM has used Android 14 "LED technology as a supporting component in the operation of tools that have been connected with the Android smartphone application.

### 2. Novelty of Terms of Use

Android based UDM shotgun gauge is very easy to understand in its use. Because all applications are easily accessed through the smartphone android application, so users can anytime and anywhere learn again and again. Then the features displayed on the application are also very easy to understand. So that all age groups can easily do it. After conducting the test, the data will be stored in the application automatically, making it easier for users to access the document results of the tests performed. The results of the repulsion can be directly ranked, so that the determination of the champion can be immediately known. Thus the track record of each athlete will be stored properly, the trainer will easily evaluate each time and make reference data when compiling an exercise program. Particularly for the type of typing event organizer the shot put number will be able to easily access the data of the results of the race and can be known by the audience, coaches, athletes and other media through the existing monitor display.

## 4 Conclusion

Based on the results of data analysis obtained from several stages both the expert validity test / expert, then proceed with small-scale group trials and large-scale group trials obtained an average score of small-scale group trial stages obtain an average so that the average value the results of small-scale trials are 85.4% the category of "Good" which means that the android-based shotgun gauge is "feasible". the average value of the results of large-scale group trials is 86.2% the category of "Good" which means that the android-based shotgun gauge is "feasible" to measure obrain-style shotguns.

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