Field Validation Towards Quality Dimensions Of Single Index Methods Software To Support Investment Management Learning

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ABSTRACT

Recently, the existence of the internet is a necessity in the wider community, even has penetrated the world of education. Various innovations in education are designed to help the learning process so that the learning process in the classroom is more effective. One of the materials in the Investment Management course is the determination of portfolio combinations that can optimize investor returns. For this reason, the software is designed to assist in analyzing optimal portfolios using the Single Index Method. The purpose of this study is to conduct field validation so that the design of Single Index Methods Software is valid and feasible to use. Field validation is done by distributing questionnaires to students to determine student perceptions of the quality dimensions from the Single Index Methods Software. The survey was conducted on 40 students who have taken Investment Management courses. The results showed that the three database of field validation consisted of technical quality, ease of use, and appearance are valid so that the Single Index Methods Software can be used to support classroom learning.

Keywords— Single Index Methods Software, Service Quality Dimension, Field Validation, Investment Management

1. INTRODUCTION

A portfolio is a collection of investment assets, which can be property, deposits, stocks, gold, bonds, or other instruments. A stock portfolio is a collection of investment assets in the form of shares, either owned by individuals or companies. In a portfolio, an investor has the opportunity to diversify (selection of many securities) on various investment opportunities. Diversification itself is intended to reduce the risk borne. The formation of a portfolio involves identifying which securities will be selected, and what proportion of funds will be invested in each of these securities. Also, it is expected that an optimum portfolio will be formed, that is, a portfolio chosen by investors from the many available in an efficient portfolio.

It requires software that can provide accurate information, which can help investors to determine the optimal portfolio with various existing models. Investment decisions related to portfolio selection are discussed in the Investment Management course, but so far in the learning process, students are still given theoretical information, not yet associated with real information on the capital market.

For this reason, an Optimal Portfolio Determination is needed, which is connected online with the Indonesia Stock Exchange, so that the data used is real data in the capital market. This software can also be useful for the learning process of accounting, especially the Investment Management course, because so far the discussion on optimal portfolios is still limited to theoretical understanding, and has not yet practiced

directly on the conditions of companies listed on the Stock Exchange.

Optimal portfolio selection is discussed in the Investment Management course, but so far, the determination of the optimal portfolio is still done manually. This software is expected to help the learning process of investment management courses.

The purpose of the portfolio performance assessment is to find out and analyze whether the portfolio formed has been able to increase the likelihood of achieving investment objectives and can be known which portfolio has better performance. The performance of a portfolio must always be monitored to maintain optimal portfolio performance.

The Single Index Model is an observation of the price of a security that fluctuates in the direction of the market price index. It means that the stock price will go up when the Composite Stock Price Index goes up, and the stock price goes down when the Composite Stock Price Index goes down.

The Single Index Model is a simplification of the Makrowits model, which can be used to calculate return expectations of portfolio risk.

The single index model divides the return of security into two components namely;

a. The unique return component is represented by alpha (αi), which is independent of the market return.

b. The return component associated with market return is represented by beta (βi) and RM so that the return expectation form can be written with the equation;

$E (Ri) = E (\alpha i + \alpha i. RM + ei)$ or

$= E (\alpha i\ I) + E (\alpha i\ i). E (RM) + E (eI)$

or can be formulated as follows;

E (Ri) = αi i + αi i. E (RM)   (1)

Determination of the optimal portfolio is done by calculating the Excess Return to Beta (ERB) which is the difference between expected returns and risk-free asset returns. Through this Single Index model, the optimal portfolio will contain assets that have a high ERB value. Assets with low ERB values will not be included in the optimal portfolio.

The ERB formula is as follows:

(2)

Information:

ERBi = Excess Return to Beta i
E (Ri) = expected stock return i
Rf = risk-free rate of return
βi = beta of stock i

$$ERB_i = \frac{E(R_i) - R_{BR}}{B_i}$$

The method for developing Single Index software is System Development Life Cycle (SDLC). In the SDLC, there are three stages, namely: a) the definition phase, b) the construction phase, and c) the implementation phase. The definition stage is the stage in defining the system in detail so that the system built by computer specialists is by the existing needs.

Information for each of the three stages of SDLC is as follows:

Definition Phase is the stage of defining in detail about how the system works. At this stage, there are two activities, namely a) Feasibility Analysis, at this stage the definition of the input that must be entered, who is the user of the system, the database needed, and the desired output. At this stage, there is also a cost and benefit analysis of the system to be made; b) Requirements definition, at this stage, a comprehensive system requirements document is made, which contains a detailed description of the output of the system and the processes used to convert input data to output. The entire SDLC process depends on defining the needs carried out here, which includes defining what the system will do accurately and completely. The output of this stage is a comprehensive system requirements document, which contains a detailed description of the output and the entire process used to convert input data into output. This document must be approved by the parties concerned. Once approved, the system requirements are considered permanent and cannot be changed until the operation and maintenance stage.

Construction Phase is a phase that is carried out after the definition phase. The stages include several steps, such as a). System Design Phase. At this stage, the Information Systems Specialist designs the system based on all existing needs. This design includes hardware and software that will be used, the contents and structure of the database, the processing modules and the relationship between one module with another module. The result of this stage is a document that contains information about how the system works. Furthermore, this document is submitted to the programmer to make the programming code and data base. b). Building and Testing the System. At this stage, computer programming and detailed database of files and files in the system are made. After that, testing the entire system involves the user to ensure that the system can run according to user needs.

Implementation Phase is the application phase of the system that has been created. This stage includes a). It is installing the System. At this stage, data conversion is carried out (transferring from the old system to the new system), providing training to users and system operators. If the user does not know how to use the system and reject changes, then

the system will fail. b). Operations and Maintenance. This stage is the final stage of SDLC. System maintenance is needed to modify the system so that it can adapt to changing needs in the organization.

2. METHODS

The method used in developing the Single Index software follows the pattern of system development using the System Development Life Cycle (SDLC) method.
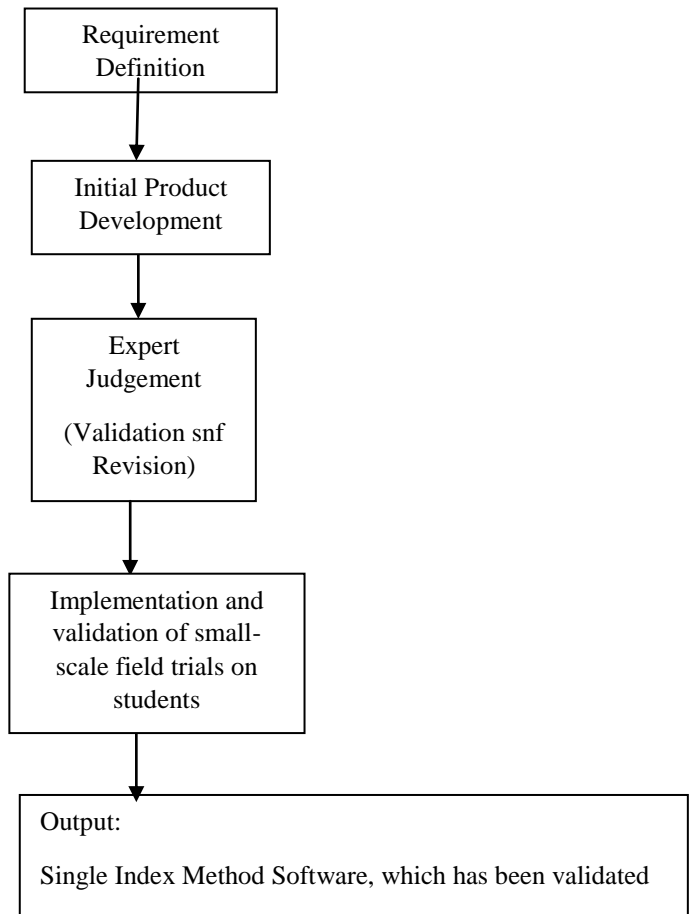
The flowchart in this study for this study is as follows:

Requirement Definition

↓

Initial Product Development

↓

Expert Judgement

(Validation snf Revision)

↓

Implementation and validation of small-scale field trials on students

↓

Output:

Single Index Method Software, which has been validated

Fig 1. Development of the Single Index Method software

Description:
This research has several stages, namely:
a. Requirements Analysis
b. Initial Product Development
c. Expert Validation
d. Field Validation
e. Revision

Based on the results of the validation of material and media experts, this software has been valid in terms of material and media, so it is ready to be validated by users in the learning process (field validation), namely validation by students who

have taken Investment Management courses, Students are asked to provide criticism and advice on technical quality, ease of use, and appearance

Field Validation Instruments

The instrument used in the validation was a questionnaire. This questionnaire uses a Likert scale (4 scales). The criteria for each rating scale are as follows:

Score 4 If very good / very interesting / very clear / very easy / very precise / very appropriate / very feasible

Score 3 If it is good / interesting / clear / easy / appropriate / appropriate

Score 2 If it is not good / not interesting / not clear / not easy / not appropriate / not appropriate / not feasible

Score 1 If it is not very good / very unattractive / very unclear / very not easy / very inappropriate / very inappropriate / very inappropriate.

The questionnaire used as an instrument in software validation also includes comments and suggestions for the validator as a material for further revision.

Data analysis technique

For qualitative data, the analysis conducted is an analysis of suggestions, responses, and criticisms from the validator, while for quantitative data analysis, a percentage analysis technique is used, with the formula:

$$P = \frac{\sum x}{\sum x1} \times 100\%$$

Information:

P = Percentage

$\sum x$ = Number of answers of all respondents in 1 item

$\sum x1$ = The ideal number of answers in 1 item

After being analyzed, then to determine the conclusions of each validated item, the following criteria are applied:

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TABLE 1. VALIDATION CRITERIA

SCORE	CRITERIA
80-100	Valid
60 – 79	Quite Valid
40 – 59	Less valid (Revisi)
0 – 39	Not valid (Need Revision)

Source: sudjana (2005)

3. RESULT

For validation, the questionnaire gave to the students who have taken Investment Management courses.

Table 2 shows the results of field validation. The Technical Quality is 92,98 % (valid), Easy of Use is 92,5% (valid)., and Appearance is 90,16% (valid). Based on this validation, Single Index Methods Software was declared valid and did not need revision.

TABLE 2. FIELD VALIDATION

No	Explanation	Score		Percentage (%)	Result
		X	Xi		
1	Technical Quality				
a.	Data Completeness	145	160	90,6	Valid
b.	Image object	149	160	93,1	Valid
c	Clarity of Software Usage Instructions	155	160	97,5	Valid
d	Formula accuracy	149	160	93,1	Valid
e	Exercise Guidance	145	160	90,6	Valid
	Average	**3,72**	**4**	**92,98**	**Valid**
2	Ease of Use				
a.	Key functions are easy to use	146	160	91,25	Valid
b.	Accuration of key functions	149	160	93,1	Valid
c.	Operational instructions are easy to understand	149	160	93.1	Valid
	Average	**3,7**	**4**	**92,5**	**Valid**
3	Appearence				

a.	Compatibility of color selection	141	160	88,13	Valid
b.	Compatibility of color selection	148	160	92,5	Valid
c.	Font size	142,7	160	89,17	Valid
	Average	**3,56**	**4**	**89,93**	**Valid**

Table 2 shows that the score entire component of Technical Quality such as Data Completeness, Image object, Clarity of Software Usage Instructions, Formula accuracy, and Exercise Guidance is higher than 80. It means that the Users assume that the technical quality of this software is valid Accuration of key functions

Besides that, the user feel that the software is easy of use. It is because the score of each componsent of Easy of Use such as : Key functions are easy to use, Accuration of key functions and Operational instructions are easy to understand is higher than 80.

Moreover, user agree that the appearance of the software is good, because the score of Compatibility Of Color Selection, Compatibility Of Color Selection, and Font Size are higher than 80

4. CONCLUSION

The Single Index Methods Software can support the learning of Investment Management course.. Students can use this software to get a better understanding of the optimal portfolio selection. Besides that students who are conducting research on optimal portfolios can also use this software.

Single Index Methods Software using the recent and real data of stock price in the Indonesia Stock Exchange., so it can improve the effectiveness of the learning process.

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