Spreadsheet-based accounting application with transaction cycle approach for manufacturing company

Ni Luh Nyoman Ayu Suda Susilawati[1], Ni Ketut Sukasih, I Made Ariana
Accounting Department, Politeknik Negeri Bali
Jalan Kampus Bukit Jimbaran, Kuta Selatan, Badung 80364, Bali, Indonesia

Email[1] : ayu_ssila@yahoo.com

Abstract. Spreadsheet-based applications are widely used by companies to process accounting data. Therefore, the development of spreadsheet-based accounting applications with transaction cycle approach is important for the company. The purpose of this study is to develop the spreadsheets – based accounting application with transaction cycle approach for manufacturing company. The study model used was adapted from Borg & Gall's research and development model. The activities undertaken are conducting needs analysis, developing the spreadsheets – based accounting application with transaction cycle approach for manufacturing company, and test its feasibility. Data obtained consisted of quantitative and qualitative data. Qualitative data include of the comments and suggestions contained in the questionnaire. Instruments used in this evaluation is the expert perception questionnaire with 4 Likert scale, from 1 (very poor) to 4 (excellent). The feasibility of application includes the technical and operational aspects. The technical aspects measure the ability of hardware and operating system to respond the spreadsheets – based accounting application, simplicity and ease of use. Operational aspects relates the ability of users using the spreadsheets – based accounting application, the ability of the spreadsheets – based accounting application to produce information, and control applications of the spreadsheets – based accounting application.The qualitative data were have analyzed descriptively, and quantitative data were analyzed by using percentage analysis. The conclusions of study are: 1) the spreadsheets – based accounting application with transaction cycle approach for manufacturing company consists of purchase cycle, sales cycle, material use cycle, and cash cycle; 2) the spreadsheets - accounting application is feasible from the technical and operational aspects.

Keywords: accounting, transaction cycles, manufacturing, spreadsheet

1. Introduction

Companies need to have effective and efficient data processing methods. The data processing methods chosen by the company can vary from simple to complex. This option is adjusted to the volume of data processed, the complexity of data operations, data processing time constraints, and others. When the volume of data is processed more and more, the more complicated the operational data, and time constraints in generating information, then the use of software (software) computer becomes more important. Computer-based accounting applications used by companies to process data into information required by users. Companies can use off the selft accounting software or develoving Accounting Applications. From off the selft accounting software produced by suppliers and sold to users. The developed pccounting applications are developed independently in accordance with the operations of each company (Rama and Jones, 2006: 8).

Spreadsheet-based applications are widely used by companies to process accounting data. Given the importance of the role of spreadsheet-based applications in the company, the students of Accounting Department of   Bali State Polytechnic need to be equipped with the ability to design and use spreadsheet-based accounting applications. Therefore, students are not only given accounting practices manually but must also be given computer-based accounting practices.

The cost accounting labrary is one of the practice courses in Accounting Department of the Bali State Polytechnic. The cost accounting labrary module used is still manual. Spreadsheet-based spreadsheet cost accounting module with transaction cycle approach has not been used because based on the survey result (shop / library) it is known that there is not yet a cost accounting lab module that suits the needs of Accounting Department. Therefore, it is necessary to develop application of spreadsheet-based manufacturing accounting cycle with transaction cycle approach as the basis for preparing the cost accounting labrary module.

The purpose of this res earch is to produce model of spreadsheet-based manufacturing accounting cycle application with transaction cycle approach, and produce cost accounting labrary module in Accounting Department of the Bali State Polytechnic.

The use of spreadsheet-based manufacturing accounting cycle application with transaction cycle approach in accounting learning can improve the understanding and mastery of teaching materials. Nurcholisah et al. (2011) examines the use of excel programs to improve the teaching and learning process in the introductory course of accounting. Masruroh (2015), examines the development of accounting module based on scientific approach on cost accounting subjects. Novianti (2015), examines the development of fixed asset based scientific approaches to support the implementation of K-13. Each of these studies examined only a small portion of the cost accounting material. The development of spreadsheet-based practice module with transaction cycle approach is expected to improve student competence. According Sugiarta (2008), the use of computer-based introduction laboratory computer module can improve the implementation of learning programs, learning activities, and learning outcomes. According Triandi and Stephanie (2010), computerized by using Microsoft Excel can produce accurate information more quickly. According to Ariana (2016), the use of basic computer-based accounting practice module with transaction cycle approach can improve student competency achievement. Transaction processing system consists of three cycles, namely purchasing cycle, income cycle, and conversion cycle (Rama dan Jones, 2006: 8). The transaction cycle approach makes it easy in accounting learning (Samryn, 2012).

The module is a form of instruction-based instructional material designed for self-study. Teaching materials are materials or lecture materials systematically arranged by lecturers and students in lecturing process (Unpad, 2011), Kemdikbud (2011), Daryanto (2013). Several researches on the development of teaching materials have been done, among them by Thelbic Lasut (2015), Yani Ramdani (2012), and Triananingsih (2007).

The purpose of module writing by Directorate of Higher Education (2014) and Unibraw (2010) is to clarify and simplify the presentation of messages so as not to be verbal, to overcome the limitations of time, space, and the sensory power of learners and learning resources, can be used appropriately and varied. According to Daryanto (2013: 9) and Schomsin Widodo and Jasmadi (2008), a module can be said to be good and interesting and improves learning motivation if there are self instructional, self contained, stand alone, adaptive and user friendly characteristics.

2. Research methods

In this research used research and development model (Research & Development) Borg & Gall. This approach is often used in research development of teaching materials. Modifications to this approach are tailored to the development undertaken (Pujiati: 2007).

This research is designed to take place in two years where the research and development procedure is carried out in seven stages, the 1st year is: 1) needs analysis, 2) development of spreadsheet-based accounting cycle application with transaction cycle approach, 3) testing of spreadsheet-based accounting cycle application with cycle approach transactions, 2nd year, namely: 4) determination of costing laboratory module model module, 5) development of cost accounting module draft, and 6)

testing of cost accounting lab module. Data collection methods required in the development of the first year of the survey and interviews and instruments of data collection by questioner

3. Result and discussion

3.1 *Spreadsheet application draft*

The application of manufacturing accounting cycles with a transaction approach is designed to be used in completing the manufacturing company's accounting cycle. The application sections of this accounting cycle are as follows:

3.1.1 *Company information*

Company information contains company information, accounting information, authorization information, and language options. Company information includes the company name, address and city where the company is located. Accounting information includes; Information on the dates, and periods covered in the financial statements, and the VAT rates. Authorization information includes the names of officials and positions authorized to authorize. The choice of language contains language options for use in print reports and financial reports (Indonesian or English). Automation is only done on account data. The account data will be automated in such a way as to optimize the use of the IF () function and the VLOOKUP () function by taking into account the language options in the enterprise information section.

3.1.2 *Account*

The account consists of two parts: a full account and an account. The full account contains information about a relatively more complete account. While the contents of the account tailored to the choice of language, if Indonesia is selected then the name of the account in the Indonesian language that appears, if not selected then the English language that appears is the account name in English.

3.1.3 *Costs*

The fee contains information about the serial number, cost name, cost number, sub charge, H / D, beginning balance, and final balance.

3.1.4 *Vendor*

Vendors contain information about the serial number, vendor name, vendor number, address, city, phone, terminal, and beginning balance of payable on each vendor.

3.1.5 *Customers*

The customer contains information about the serial number, customer name, customer ID, address, city, phone, customer details and outstanding balance

3.1.6 *Inventory*

The inventory contains information about the serial number, item name, item number, unit, purchase price, selling price, initial amount, and inventory value.

3.2 *Transaction Cycle*:

3.2.1 *Purchase cycle*

The purchase cycle form is used to enter transactions related to the buying, purchasing, repurchase, and debt repayment cycle arising from purchases made on credit. This section will be automated in such a way by optimizing the use of the appropriate IF () and VLOOKUP () functions and formulas.

3.2.2 *Sales cycle*

The sales cycle form is used to include transactions related to the sales cycle, ie sales, sales proceeds, and receivables arising from sales made on credit. This section will be automated in such a way by optimizing the use of the appropriate IF () and VLOOKUP () functions and formulas.

3.2.3 *Cash cycle*

Cash cycle form is used to enter transaction related to cash cycle that is cash transaction not from debt payment transaction arising from purchase, not from transaction of cash receipt from revenue from sale. This section will be automated in such a way as to maximize the use of the appropriate IF () and VLOOKUP () functions and formulas. Cycle of material use. The form of material use cycle is used to

enter data relating to the use of materials for the production process. This section will be automated in such a way as to maximize the use of the appropriate IF () and VLOOKUP () functions and formulas.

3.2.3.1 *Purchase journal*

The form of a purchase journal is an output containing the date, invoice, description, ref, debit (purchase, VAT input, transportation cost), credit (debt). Automation is done by maximizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.2.3.2 .*Sales journal*

The form of sales journal is output containing date, invoice, description, ref, debit (receivable), credit (sales, VAT proceeds, catch income). Automation is done by optimizing the use of the functions IF (), SUMIF (), and VLOOKUP (), as well as the appropriate Cash Adjustment formula. The form of cash receipts is output that contains date, no deck, description ref, debit (cash, deduction), credit (receivable, income, penalty, etc.). Automation is done by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas. Journal liquidation of cash The form of cash dispensing journal contains date, check, description, ref, debit (debt, fin charges, etc), Credit (purchase, cash). Automation is done by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.2.3.3 *Journal of materials Use*

General journal forms include general journals to record material use transactions. General journal form contains date, no BPPB, description, no account, account name, amount, debit, and credit). Automation is done by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas. General ledger

General journal forms include general journals to record transactions that can not be recorded in special journals, journal adjustments and journal closures. General journal form contains date, no proof, account name, no account, debit, and credit). Automation is done by optimizing the use of the functions IF (), SUMIF (), and VLOOKUP (), as well as the appropriate formula

3.3 *Ledgers and subsidiary ledgers*

3.3.1. *Ledgers*

The ledger form contains the account name, account number, date, description, ref, debit, credit, and balance (debit, credit). Automated ledgers by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

Debt help book The Debt Relief Form contains vendor names, vendors, addresses, cities, dates, descriptions, debits, credits, and balances. Automated debt help book by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.3.2.*Subsidiary ledgers*

3.3.2.1 *Additional trade receivables*

The forms of accounts receivable of a child consist of customer name, no customer, address, city, date, description, debit, credit, and balance. Automatic accounts receivable ledgers by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas

3.3.2.2 *Inventory of books*

The helper auxiliary form contains the name of the goods, no goods, units, beginning balance, date, description, debit, credit, amount. Auxiliary authors book by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.3.2.3 *Additional book costs*

Additional fee form contains date, description, debit, credit, amount. Automated cost help book by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.4 *Trial balance, and worksheet*

3.4.1. *Trial balance*

The trial balance form contains account names, account numbers, debits and credits.

3.4.2. *Worksheet*

The worksheet form contains no account. account name, trial balance (debit/ credit , adjustment (debit / credit), adjusted trial balance (debit / credit), profit &loss (debit/credit), financial position (debit / credit).

Trial balance, and worksheet data are outputs in the manufacturing accounting cycle application with a transaction cycle approach. Trial balance, and work sheet are performed automatically by optimizing the use of IF (), SUMIF (), and VLOOKUP () functions, as well as the appropriate formulas.

3.5 *Financial statements*
3.5.1 *Income statement and other co mprehensive income*

This form contains the components of the income statement and other comprehensive income as defined in IFRSs.

3.5.2 *Statement of financial position*

This form contains the components of the statement of financial position as set forth in IFRSs.

3.5.3 *Statement of changes in equity*

This form contains the components of the statement of change in equity as stipulated in IFRSs.

3.5.4 *Statements of cash flows*

This form contains the components of the cash flow statement as defined in IFRSs.

3.5.5 *Notes to the financial statements*

This form is the place to fill the notes to the financial statements as contained in IFRSs Financial statement data in addition to notes on financial statements is the output in the application of manufacturing accounting cycles with a transaction cycle approach. The financial statements (income statement and other comprehensive statements of income, statement of financial position, statement of changes in equity, and cash flow statement) are performed automatically by optimizing the use of the appropriate IF (), SUMIF (), and VLOOKUP () functions and formulas. More Reports In addition to the financial statements, this application can also generate other reports such as cost reports (cost recapitulation, cost allocation, and production costs), list of accounts payable, and list of accounts receivable.

3.6 *Ending balance*

The trial balance form includes account name, account number, debit and credit. The closing balance sheet data is the output in the accounting cycle application with the transaction cycle approach. The balance of the balance is closed automatically by optimizing the use of the functions IF (), SUMIF (), and VLOOKUP ()

3.7 *Application controls*

Application controls which is used to improve the application control of the accounting cycle among others; password file, protect workbook, protect sheet, locked, data validation, and conditional formatting.

3.8 *Application menu*

The application menu is used to set the dialog between the inside of the application. This menu is designed by considering the process in accounting.

3.9 *Spreadsheet application tests*

Testing spreadsheet application draft The first draft test of the accounting cycle (I) is carried out by providing a questionnaire to accounting experts and computer experts to assess the feasibility of

applying the accounting cycle from a technical and operational point of view. Technical aspects include; hardware and operating systems support the implementation of the accounting cycle, simplicity and ease of use of accounting cycle applications, while the operational aspects include; the ability of users to use the accounting cycle application, the ability of the accounting cycle application to generate the necessary information, and the control of applications owned by the accounting cycle application.

. Based on the results of draft test I accounting cycle from the technical point of view, it can be seen that 40% agreed, and 60% strongly agree that the hardware and operating system can support the implementation of the accounting cycle. 12.5% disagree, 77.5%, agree, and 10% strongly agree on the simplicity and ease of use of the accounting cycle application. Thus it can be said that the application of the accounting cycle has met the technical aspects of computer-based applications And from the operational aspect it can be seen that 25% of respondents stated disagree, 70% agreed, and 5% stated strongly agree that users can use the accounting cycle application. 15% of reviewers stated disagreed, 47.5% agreed, and 37.5% stated strongly agree that the accounting cycle application can produce the necessary information. 43.3% of examiners stated that they did not agree, 50% agreed, and 6.7% stated strongly agree that the application of the accounting cycle has adequate application control. Thus it can be said that financial accounting applications have met the operational aspects of computer-based applications. Suggestions submitted by experts for the improvement of this application have been implemented. The suggestion is:

1) The column headings of a particular form can be used to record transactions with higher complexity.
2) Need to make the link easier to move between the inside of a sheet of paper.
3) Marking the parts on the worksheet that has been filled with functions and formulas to facilitate its use.
4) Utilize the use of protection to secure the division of functions and formulas made on the application

4.Conclusions and recommendations

4.1.*Conclusion*
Based on the discussion can be summarized as follows:

1). Students judge that manual lab manual module is good. Students expect spreadsheet modules cost-effective as needed.

2). The concept of applying a spreadsheet-based manufacturing accounting cycle with a transaction cycle approach using multiple transaction cycles, namely the buying cycle, sales cycle, material use cycle, and cash cycle.

3). Experts judge that the design of a spreadsheet-based manufacturing accounting cycle with a transaction cycle approach meets the technical and operational requirements of computer-based applications.

4.2 *Suggestion* Based on the conclusions that can be suggested to the Accounting Department of Bali State Polytechnic must provide spreadsheet-based cost accounting lab module in accordance with the need to increase its influence.
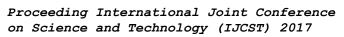
5. Acknowledgments

and higher education in Indonesia, technical staff and all those who have been assisted in conducting this research.

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