The Fabrication of Main Cost Application Production with Job Order Costing Method at Tape Company in Sidoarjo

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ABSTRACT: PT. X located in Sidoarjo, as tape manufacturer, currently records information in the form of physical documents, and Microsoft Excel for every job. This may causes searching documents very difficult and time consuming because it still uses manual system, difficult to calculate the cost of production because doesn't know how much the cost of raw materials used in the production process, and often errors in the recording information. This application created using HTML5, PHP, Javascript, CSS3, PHP framework Laravel 5 programming language, and MySQL database. Apllication interface is created using Bootstrap template AdminLTE.The final result of this application development are integrated production cost information, record of sales contract, invoice, receipt, order of delivery, order of production, result of production, purchase order, cash outlay, and calculating the cost of production with job order costing method based on raw materials used in production process. Keywords: Cost of production, job order costing, Laravel, AdminLTE, Applications.

1. Introduction List of the production cost appropriately to determine the selling price, therefore with the development of information systems growth very fast today, many companies stand to increase information production, information calculation, and improvement of service effectiveness. PT. X is a company producing tape in various sizes. The customer PT. X can order tape according to the specifications they need. PT. X currently does not have an information system application, hence to do record of inventory, supplies, work orders, production, materials used for each production, sales contract, accounts receivable reports, cash disbursement reports and delivery schedules made manually then moved to Microsoft Excel, means while for calculation of goods manufactured cost by manual calculation. With the recording done manually will certainly cause problems, such as to complicate the process of searching data, and often do mistake in recording. In overcoming these problems, the author wants to help by creating a computerized system that is able to provide convenience in recording all activities within the company, as well as calculation of cost of production. With the computerized system is expected to perform in the company more efficiently, reduce human mistakes, and able to increase profits for the company. 2. Theoretical Basis 2.1 Information Systems The system is a procedures network that relate to another, gathered together to achieve certain goals. Information is data that has been processed into a form that is more useful for the recipient. The information system is a system within an organization that connecting the needs of daily transaction management, supporting operations, managerial nature, and strategic activities of an organization, providing certain outside parties with the required reports [4]. In general understanding,

information system is a regular combination of people, hardware, software, communication networks, and data resources that collect, change, and disseminate information within an organization. Humans rely on information systems to communicate with physical hardware, information processing instructions or software, networking and data resources. 2.2 Cost Accounting Cost accounting is one branch of accounting that is used as a management tool to monitor and record transaction costs systematically, as well as presenting cost information in the form of cost reports [7]. The three main objectives of cost accounting within a company are: [6]: a. Product cost pricing. b. Cost control. c. Specific decision-making for the foreseeable future. To fulfill the purpose of determining the production cost, accounting records cost, classifying, summarizing the costs of making the product or the delivery of services. Costs which is collected and presented are costs incurred in the past or historical costs. With the existence of cost information, therefore the company can find out whether the company's activities so far generate profits or losses. 2.3 Production Cost Production cost is a collection of consisting of direct material costs, direct employee costs, and factory overhead costs plus product inventory in the initial processed and reduced product inventory in the final process. Production cost is tied to a certain period of time. The production cost will be equal if there is no product inventory in the initial and final process [1]. Production cost consists of the following elements as below [3]: a. Direct material costs Direct materials cost is the material used to produce the finished product. Raw materials that related to all types of materials used in the manufacture of finished products, and the finished product of a company may become the raw material of other enterprises [2]. b. Direct Employee Costs The Costs incurred to pay employees that converts raw materials into finished products and can be properly expensed to certain products. c. Factory Overhead Factory overhead costs is production costs in addition to direct material and employee costs. The factory elements overhead cost included the cost of materials, indirect labor costs, factory electricity costs, depreciation costs of plant machinery, and other costs that the company specifies as factory overhead costs. The method used to calculate the cost of production as follows [6]. Production Price = material cost + employee cost + overhead cost. 2.4 Job Order Costing Method Job order costing method is a way of calculating the production costs where these are collected for a particular order and the production cost per unit of product produced to fulfill the order is calculated by dividing the total of all production costs for the order by the amount unit of product in the order in concerned [6]. Job order costing method has several characteristics as follows [6]: a. The Company produces a wide range of products according to the specifications that customer demand and each type of product needs to calculate the cost of production individually. b. Production costs should be categorized based on their relationship to products that become direct production costs and indirect production costs. c. Direct production costs consist of material costs and direct employee costs while indirect manufacturing costs are called factory overhead costs. d. Direct production cost is calculated as the production cost of a particular order based on actual cost into the cost of order based on the rate specified in advance. e. The production cost per unit of a particular order is calculated at the time the order is completed by dividing the total production cost incurred for the order by the number of units produced in the order concerned. 2.5 First In First Out Method Method of taking the price of materials for production using first in first out method. The first in first out method assumes the incoming goods must first be removed from the warehouse [3]. FIFO example: January 10 - Buy: 2000 units @ Rp. 1000, total: Rp. 2,000,000 January 12 - Sell: 1000 units @ Rp. 1000, total: Rp. 1,000,000 January 13 - Buy: 2000 units @ Rp. 1500, total: Rp. 3,000,000 January 15 - Sell: 1000 units @ Rp. 1000, total: Rp. 1,000,000 On January 12thsold 1000 units @ Rp. 1000, - of the stock purchased on January 10th and leaving 1000 units, afterward on January 15thsold 1000 @ Rp. 1000, - of the inventory purchased on January 10th, because the earliest inventory on January 10 is still not exhausted and must be issued first in the application of the FIFO method. 3. ANALYSIS AND DESIGN SYSTEM 3.1 Design Data Flow Diagram Data flow diagram (DFD) describes data flow in an organization graphically. DFD is used to document existing systems and to plan new

systems. DFD has a level to know how detailed the process in a system. DFD creation starts from level contact diagram. Context diagram place the system in an environmental context and consist of only one process symbol that describes the entire system. Subsequently, DFD is downgraded into processes that have lower level. 3.1.1 Context Diagram Context diagram design from making calculation the application system of the production cost on the company of masking tape PT. X can be seen in Figure 1. In context diagram, there are seven external entities that provide input and output to the system, namely: a. Owner receives reports on the system, performs recordkeeping, entering data of finished goods, entering material data. b. Marketing records sales contract or sales order, and creates a work order. c. Production receives work orders, performs production, production records, materials records and auxiliaries used in the production process. d. The warehouse receives information on the use of raw and auxiliary materials to make inventory changes, and records the finished goods enter to the warehouse. e. Accounting records payments made by customer, and records daily cash expense. Data Pelunasan Piutang Owner Data Perusahaan Laporan Pengeluaran KasHarian Data Pengeluaran KasHarian Laporan Pembelian Info Piutang Laporan Produksi Info Barang Jadi Info Pesanan Info Invoice Accounting Marketing After filling work order form, then user can press Add button to enter work order data. It was already entered can be seen in Figure 4. Data Bahan Baku Laporan Penjualan SC Data Customer Laporan Penjualan Terkirim 1 Data Sales Contract Data Harga Bahan Baku Sistem Informasi Data SPK Data Supplier Data Barang Jadi Figure 4. Work Order Data Data Pembelian Info SPK Data Perubahan Persediaan Produksi Data Hasil Produksi Gudang 4.2 Production Results Menu Data Pemakaian Bahan Baku Info Jadwal Pengiriman The production menu is used to input the results of the Figure1. Context Diagram production process, input the data of the use of raw materials, increase the finished goods inventory, calculate the production 3.2 Entity Relationship Diagram Design cost to be filled in production price column in the finished goods inventory data, and total production cost and overhead Entity Relationship Diagram (ERD) is a database design cost for work order that will be filled in work order data. The method that is often used in designing effective and efficient raw material data used will reduce inventory of in-app database systems. With ERD it will be clearly visible tables material. Testing is done by entering work order's production required in the system and also relationships are formed previously made. Production form can be seen in Figure 5. between these tables in the application to be made. ERD Upon filling the production form, the user can pressing Add Physical Data Model can be seen in Figure 2. From this ERD, button to enter production data. Production data can be seen can be known with more proper relationships between tables in Figure 6. Data from the calculation of production prices can formed along with data type of the table. be seen in Figure 7. The data of finished goods can be seen in Users user_id integer <pk> role_id integer <fk> Kuitansi username varchar(255) kuitansi_id integer <pk> name varchar(255) Roles role_id integer <pk> sc_id integer <fk> Figure 8. Data reduction of material inventory can be seen in password varchar(255) tgl date status integer name varchar(255) kuitansi_no varchar(15) created_at timestamp created_at timestamp updated_at timestamp created_at timestamp updated_at timestamp SalesContract updated_at timestamp sc_id integer <pk> deleted_at timestamp Figure 9. Data calculation of overhead costs and production customer_id integer <fk2> alamatkirim_id integer <fk3> user_id integer <fk1> AlamatKirim Customer sc_no varchar(15) Invoice alamatkirim_id integer <pk> customer_id integer <pk> no_po varchar(100) costs on work order can be seen in Figure 10. <fk> nama varchar(255) tgl date invoice_id integer <pk> customer_id integer varchar(255) syarat_pembayaran varchar(10) sc_id integer <fk1> alamat_kirim varchar(255) alamat telepon varchar(20) fob varchar(20) kuitansi_id integer <fk2> created_at timestamp varchar(15) updated_at timestamp fax varchar(20) total integer invoice_no deleted_at timestamp created_at timestamp tgl_pelunasan date tgl date updated_at timestamp created_at timestamp tgl_pelunasan date deleted_at timestamp updated_at timestamp created_at timestamp deleted_at timestamp updated_at timestamp deleted_at timestamp Detail Overhead Overhead detailoverhead_id integer <pk><fk2> overhead_id integer <pk> Surat Jalan

elemenbiaya_id integer overhead_id integer <fk1> bulan integer suratjalan_id integer <pk> tahun integer sc_id integer <fk1> jumlah integer max_produksi integer kendaraan_id integer <fk2> created_at timestamp updated_at timestamp total_overhead integer suratjalan_no varchar(15) deleted_at timestamp created_at timestamp tgl date updated_at timestamp created_at timestamp deleted_at timestamp updated_at timestamp SPK deleted_at timestamp Detail SPK Bahan Baku spk_id integer <pk> Elemen Biaya detailspkbahanbaku_id integer <pk> overhead_id integer <fk1> Detail SalesContract spk_id integer <fk2> sc_id integer <fk2> detailsc_id integer <pk> elemenbiaya_id integer <pk> persediaanbahanbaku_id integer <fk1> tgl_spk date suratjalan_id integer <fk4> nama_biaya varchar(255) jumlah integer biaya_produksi integer barangjadi_id integer <fk5> created_at timestamp created_at timestamp finish date satuan_id integer <fk3> updated_at timestamp updated_at timestamp created_at timestamp sc_id integer <fk1> deleted_at timestamp deleted_at timestamp updated_at timestamp spk_id integer <fk2> deleted_at timestamp invoice_id integer <fk6> tgl_kirim date qty integer Pengeluaran Kas Persediaan Bahan Baku Hasil Produksi harga_satuan integer pengeluarankas_id integer <pk> persediaanbahanbaku_id integer <pk> hasilproduksi_id integer <pk> discount integer tgl date detailpo_id integer <fk2><fk1> pajak integer deskripsi varchar(255) bahanbaku_id integer <fk1> spk_id integer barangjadi_id integer <fk2> jumlah integer jumlah integer tgl date qty integer created_at timestamp created_at timestamp harga_beli integer batch varchar(255) updated_at timestamp updated_at timestamp jumlah_masuk integer kode_box varchar(10) deleted_at timestamp deleted_at timestamp jumlah_keluar integer sisa integer keterangan varchar(255) keterangan varchar(255) Satuan created_at timestamp satuan_id integer <pk> updated_at timestamp nama_satuan varchar(20) JenisBahan Baku deleted_at timestamp jenisbahanbaku_id integer <pk> deskripsi varchar(255) Persediaan Barang Jadi persediaanbarangjadi_id integer <pk> barangjadi_id integer <fk1> Kendaraan hasilproduksi_id integer <fk2> kendaraan_id integer <pk> tgl date jeniskendaraan varchar(255) Supplier Bahan Baku harga_produksi integer plat varchar(255) jumlah_masuk integer created_at timestamp supplier_id integer <pk> bahanbaku_id integer <pk> updated_at timestamp nama varchar(255) jenisbahanbaku_id integer <fk> jumlah_keluar integer deleted_at timestamp alamat varchar(255) deskripsi varchar(255) sisa integer telepon varchar(20) sisa integer keterangan varchar(255) fax varchar(20) created_at timestamp created_at timestamp updated_at timestamp created_at timestamp updated_at timestamp deleted_at timestamp Counter updated_at timestamp deleted_at timestamp counter_id integer <pk> deleted_at timestamp nama varchar(255) no integer tahun integer Detail Purchase Order Barang Jadi integer <pk> barangjadi_id integer <pk> Info Perusahaan Purchase Order detailpo_id po_id integer <pk> bahanbaku_id integer <fk1> nama varchar(255) infoperusahaan_id integer <pk> supplier_id integer <fk> po_id integer <fk2> lebar integer nama varchar(255) tgl_kirim date panjang integer kota varchar(255) po_no varchar(15) qty integer provinsi varchar(255) tgl date harga_satuan integer warna varchar(255) syarat_pembayaran varchar(10) micron varchar(255) negara varchar(255) integer telepon varchar(20) total integer discount integer sisa fax varchar(20) tgl_pelunasan date pajak integer satuan_panjang varchar(10) jumlah integer created_at timestamp direktur varchar(255) Figure5. Production Result Form created_at timestamp created_at timestamp updated_at timestamp updated_at timestamp updated_at timestamp pembayaran long varchar long varchar deleted_at timestamp deleted_at timestamp pembayaran2 deleted_at timestamp Figure2. ERD Physical Data Model 4. Testing System 4.1 Work Order Menu Testing SPK (work order) menu is used to enter the command data to perform production to the production division. Testing is done by entering a work order from sales contract from PT. Skyline Jaya with order OPP Tape Nagata 45mm x 100m TR 43mic, a number of 720 roll. Work order form can be seen in Figure 3. Figure 6. Production Result Data Figure3. Work Order Form Figure7. Production Price Calculation Data Figure8. Residual Material Data Figure9. Material Inventory Reduce Data Figure10. Overhead Calculation and Production Data Based on work order previously, work order with ID = 1, using overhead of April totaling Rp. 21.190.000, maximum production of 36,400 roll tape per month. Then the unit overhead is

((21.190.000 / 36.400) / (48 * 100)) * (45 * 100) = Rp. 545,7589 per roll. Therefore, the total overhead work order with ID = 1 is 545,7589 * 720 = 392.946. The calculation of materials for work order ID = 1 will be explained as follows: • Use of Jumbo 43 micron 2600 meters, the calculation of total jumbo cost is (3.960.000 per jumbo / 4000 meters) * 2600 meters = Rp. 2,574,000. Jumbo cost roll of masking tape = 2.574.000 / 720 = Rp. 3575. • Core 45mm 720 roll usage, hence the calculation of total core cost is 227 * 720 roll = Rp. 163.440. • 120 PVC usage, the total cost of PVC is 2,200 * 120 = Rp. 264,000. • Using Box 10 pieces, the calculation of total box cost is 5500 * 10 = Rp. 55,000. From calculation above can be discovered of total production cost = (2,574,000 + 163,440 + 264,000 + 55.000) + 392.946 = Rp. 3,449,386, and production price = 3.449.386 / 720 = 4790.81 with rounding down into Rp. 4790. 5. Conclusion The results of making calculation of production cost application by job order costing method at tape company in Sidoarjo, can be concluded, among others: ? Applications can help the company in determining production prices and production costs based on job order costing more accurately, as well as recording overhead costs per month. ? Applications can integrate information in the company of sales contracts, invoices, receipts, mailing orders, work order, production, cash disbursements, purchase orders, delivery schedules. ? Applications can facilitate the process of recording sales contracts, invoices, receipts, mailing letters, SPK, production, cash outs so as to reduce errors in the recording. ? Applications can display reports required by the company in the form of SC sales reports, sales reports sent, purchase order reports, production reports, cash expenditure reports. ? Based on the results of the questionnaire, 84% of respondents confirmed that the application display is good, 76% of respondents said that the ease of using the application is good, 88% of respondents confirmed that the completeness of information in the application is good, 80% of respondents confirmed that the accuracy of information in the application is good, 84% of respondents confirmed that the suitability of the needs in the application is good, 88% of respondents confirmed that the report produced is good, 80% of respondents confirmed that the whole application is good.

6. REFERENCES Bustami, Bastian dan Nurlela. 2013. Akuntansi Biaya Edisi 4. Mitra Wacana Media, Jakarta. Garrison, Ray H., Norren, Eric W., dan Brewer, Peter C. 2013. Akuntansi Manajerial Buku 1 Edisi 14. Salemba Empat, Jakarta. Horngren, Charles T., Datar, Srikant M., dan Rajan, Madhav. 2012. Cost Accounting: A Managerial Emphasis 14th Edition. Pearson Prentice Hall, Upper Saddle River. Hutahaean, Jeperson. 2015. Konsep Sistem Informasi. Deepublish, Yogyakarta. Marakas, George M. dan O'Brien, James A. 2017. Pengantar Sistem Informasi Edisi 16. Salemba Empat, Jakarta. Mulyadi. 2014. Akuntansi Biaya Edisi 5. UPP STIM YKPN Universitas Gadjah mada, Yogyakarta. Supriyono. 2013.Akuntansi Biaya Pengumpulan Biaya dan Penentuan Harga Pokok. BPFE Yogyakarta.