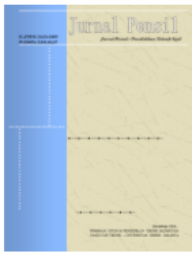
Available *online* at: http://journal.unj.ac.id

Jurnal Pensil | Pendidikan Teknik Sipil

Journal homepage: http://journal.unj.ac.id/unj/index.php/jpensil/index



# IMPLEMENTATION OF THE ACTIVITY BASED COSTING METHOD IN CONSTRUCTION

*Diah Sarasanty*[1*], *Erna Tri Asmorowati*[2]
[1,2] Program Studi Teknik Sipil Fakultas Teknik Universitas Islam Majapahit,
Jalan Raya Jabon, Mojokerto, Jawa Timur, 61374, Indonesia
[*1]diahsarasanty@unim.ac.id [2]asmoro1212@gmail.com

P-ISSN: 2301-8437
E-ISSN: 2623-1085

ARTICLE HISTORY
Accepted:
27 Desember 2022
Revision:
26 Januari 2023
Published:
31 Januari 2023

ARTICLE DOI:
10.21009/jpensil.v12i1.32323

**Abstract**

This study examines the factors that influence the application of the activity-based costing (ABC) method in construction projects. This research adopts a quantitative approach by developing a case study model. The study tested the model on a sample of 24 hydromechanical and gate works, weirs, irrigation networks, river protection, dams and ponds, coastal protection, swamp infrastructure, groundwater infrastructure, and raw water infrastructure. Primary data collected from field surveys. This study found that the proportion of indirect costs, competitive pressures in price and quality, and product diversification significantly influence a company's decision to apply the ABC method. There were found to be implications for managerial practice and public policy. It is hoped that this research will be useful in meeting the planning needs that are currently being addressed.

**Keywords:** Activity Based Costing, Project Construction, Cost Standardization

## Introduction

In regional autonomy, the government has rights, authorities, and obligations in regulating and managing its own autonomous region, both in government affairs and the interests of the local community, in accordance with applicable laws and regulations. Good Governance in regional autonomy is a phenomenon whose principle is talking about government or good government in terms of realizing good governance through the context of public services (Legowo, 2005; Moonti, 2019). An understanding that autonomous individuals are the basic capital for the realization of true regional autonomy (Basri, 2005; Er et al., 2011). Every regional autonomy budgeting must be clearly identified regarding the target and purposes to develop the region and improving transparency (Karianga, 2017; Mardhiah, 2017). The implementation of regional autonomy must be recognized as a failure to bring meaningful improvements in life for most Indonesians (Rochmansjah, 2019; Sommaliagustina, 2019). Regional autonomy has a positive impact on regional financial management because a region is given the opportunity to manage its own finances (Noviades, 2013; Rundora et al., 2013)

Expenditure Standard Analysis (ASB) is a standard used to determine the regional budget used in a program or activity to produce a certain level of service and the fairness of costs in work units in one fiscal year (Kaiser, 2019). In assessing the fairness of inputs with outputs produced, the role of Standard Expenditure Analysis (ASB) is very much needed (Yusuf et al., 2020). The preparation of ASB is important to do because there are often injustices and budget irregularities between similar activities (Ahmad et al., 2013). Expenditure Standard Analysis (ASB) can determine the reasonableness of costs and workload for carrying out activities so that it can minimize the occurrence of unclear expenditures that cause budget inefficiencies (Elghaish & Abrishami, 2021).

An effective approach to improving operational performance includes using the ABC method for various labor and resource costs and not using one factor as the basis of allocation (Schulze et al., 2012). ABC is a cost calculation that emphasizes activities that use more types of cost drivers so that they can measure the resources used by products more accurately (Rotikan, 2013). ABC can also assist management in improving the quality of corporate decision making (Kaukab, 2019). Measuring the cost and effectiveness of products, services, and activities is one of the functions of the ABC method (Tsai et al., 2019). This method is used because it can help make better decisions because the calculation of the cost of a cost object becomes more accurate (Rahmaji, 2013; Utomo et al., 2022). ABC also reveals the links between performing particular activities and the demands those activities make on the organization's resources (Cooper & Kaplan, 1991). ABC has reportedly helped many organizations to better manage their business activities (Adams, 1996).

Early in the 1990s, academics and practitioners who observed or participated in ABC implementations, found that there were other advantages, such as the capability to better manage costs and activities than just an improved calculation of costs (Gosselin, 2006). Cost-based estimating is a method of estimating using production rates and costs for work items/tasks necessary to complete the work (Culmo et al., 2013). The ABC approach has been used in previous studies and provides an effective way of estimating production costs (Tran & Tran, 2022). The majority of studies are based on practical experience and senior subjective speculation, it has been determined through an analysis of prior research on the causes of construction costs that are perpetually out of control (Li et al., 2012). Through the ABC approach, the resources consumed can be traced back to the consuming activity and subsequently to a particular cost element (Fang & Ng, 2011).

If corporate resources, such as labor, material, and equipment, are required to perform the individual activities, then an

activity-based costing technique must be developed that can accommodate the inherent variability in a process if actual costs are to be accurately predicted (Back et al., 2000).

How to use future information on the building expenses of the finished project to provide a more realistic and scientific possibility of uncontrollable costs and, as a result, some countermeasures. For current or future similar initiatives, integrated data processing software and calculating tools are needed (Mignone et al., 2016). ABC The analysis method is a data processing technique used to differentiate between minor key components and significant factors (Vetchagool et al., 2020).

Auxiliary factor based on the relevance and percentage of the data, three groups will be created. That the primary elements impacting are described using a comprehensive decomposition model. The participants in construction projects are often dispersed, which increases overhead activities and, consequently, overhead costs. Traditional cost accounting techniques include volume-based allocation and resource-based costing based on the cost of resources based on a cost structure that allocates resources' costs directly to the objects—direct, indirect, and overhead costs (Duran & Afonso, 2020). However traditional cost summary reports are also usually completed too late to serve control purposes, or are not very reliable in early completion (Zhao & Wang, 2014).

High prices due to inflation will cause an increase in construction costs, the increase will have an impact on the increase in the price of the contract (Salim et al., 2021; Zulfikar et al., 2020). Cost inflation however, utilizing these conventional approaches results in this since all indirect expenses are combined into one, which affects the pricing of the company's products (Lou & Wang, 2013). ABC is a remedy for such distortion is brought about by the division of costs among several pools and the choice of overhead activities and the necessary transformational expenses (Salawu & Ayoola, 2012). In order to structure and integrate its main components, this review will look at the roles that factor models and activity-based costing play in construction as follows:

1. Improving the ability of work units to prepare budgets based on the priority scale of APBD, main tasks and functions, goals, objectives, and performance indicators for each planned program and activity.
2. Prevent duplication and/or overlap of activities and budgets for each and between work units.

Improving the efficiency, effectiveness, and accountability of the expenditure budget in planning, implementing, and controlling (Krishnan, 2006). This is also part of the steps to optimize the APBD which is used as a benchmark for achieving local government targets (Syafputro & Ibrahim, n.d.).

## Research Methodology

Time-driven ABC requires estimates of only two parameters: (1) the unit cost of supplying capacity and (2) the time required to perform a transaction or an activity (Kaplan & Anderson, 2003; Liberatore et al., 1998). The required data is collected from the Technical Implementation Unit and related OPDs. The required data is in the form of
1) Budget Implementation Document Data from 2017–2021, 2) Standard Goods Price Unit Document, 3) General Expenses Standard Document, 4) Unit Prices of Basic Activities in 2023, 5) Analysis of the Unit Price of Work in the Water Resources Sector.

Determination of Water Resources Activities, Regional Finance, Development Planning, and Nomenclature based on the Regulation of the Minister of Public Works and Public Housing No. 1 of 2022 concerning Guidelines for Preparing Estimated Costs for Construction Work in the Public Works and Public Housing

Sector, construction activities in the water resources sector.

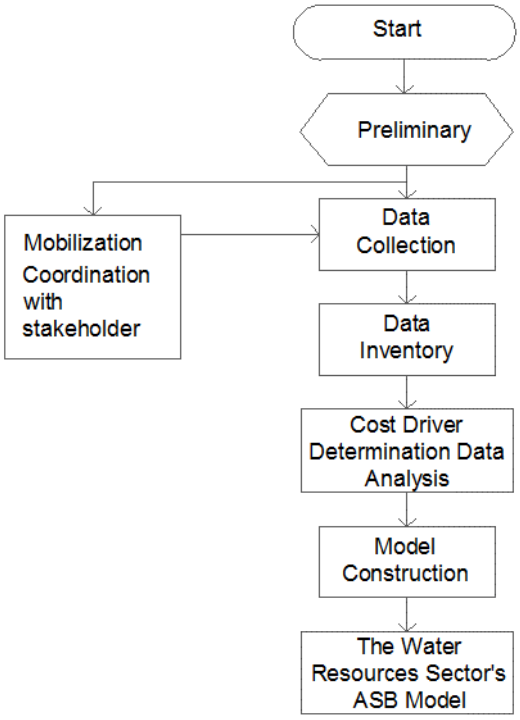



Figure 1. Research methodology

The stages of this research are explained in detail as follows:

1. The data collection stage is the data collection stage in the form of the Budget Implementation Document (DPA) for 2021 and the Changes in Budget Implementation Document (DPPA). SKPD DPA data is considered correct and valid because DPA is an agreement between the executive and the legislature. Furthermore, the DPA has a strong legal basis, namely in the form of a regional regulation that has been included in the regional sheet. as well as for 2020, 2019, 2018, and 2017 to each UPT in the specified area and also obtain the necessary data. Data was also obtained from other technical agencies and OPDs that had similar activities. as well as data from OPD supervisors, namely the BPKAD of East Java Province and the AP Regional Secretariat Bureau of East Java Province.
2. Activity Equalization Stage. The equalization of activities is carried out to classify the list of various activities obtained from the data collection stage into types or categories of activities that have similar activity patterns and equivalent workloads. That is, activities with the same amount of work will be grouped in the same class or group. This stage is carried out to fulfill the first basic assumption, namely that the preparation of an ASB must be based on the principle of performance-based budgeting.
3. Model Formation Stage

The model was created to obtain an overview of the value of spending and its allocation in the regional government. This stage includes three main steps, namely:

1. Search for cost drivers for each type of activity. Expenditure controllers (cost drivers) are the factors that influence the size of an activity's expenditure. There are two types of cost drivers, namely, real (real) cost drivers and pseudo (pseudo) cost drivers.
2. Search for the value of fixed expenditure (fixed cost) and variable expenditure (variable cost) for each type of activity. The total expenditure value of each type of activity is separated into a fixed expenditure value and a variable expenditure value. Thus, with each increase in the quantity of performance targets, we will be able to analyze the increase in variable spending.
3. Determination of the average value (mean), lower limit, and upper limit for each expenditure distribution. The average value, lower limit, and upper limit are calculated to obtain an initial picture of the average expenditure allocation for each

type of activity and its expenditure controllers.

## Results and Discussion

The analysis of standard construction costs in the water resources sector will be calculated using the activity-based costing (ABC) method (Tri Asmorowati E, 2021). Where it involves construction activities, it cannot be separated from the Regulation of the Minister of Public Works and Public Housing No. 1 of 2022. Activities in construction are in the form of activities carried out to complete the work. While the activity drivers are the coefficients of the unit price analysis, units, and unit prices, while cost objects are the goal of construction spending.

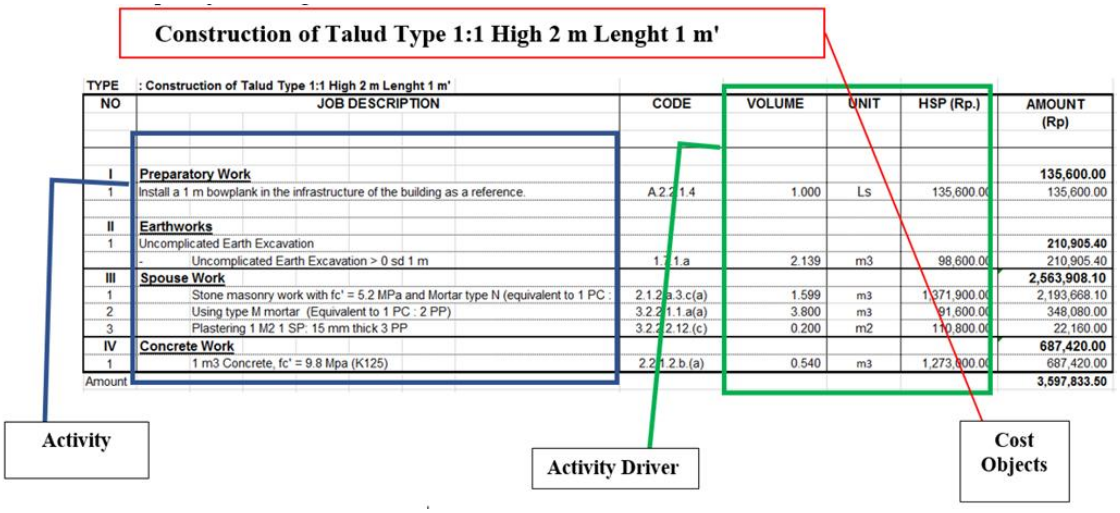



Figure 2. Applying the ABC method in determining ASB

The figure above is an example of applying the ABC method in determining ASB in the following jobs. ASB in the SDA sector will be categorized into rehabilitation, light maintenance, and operations and maintenance (OP) activities. Irrigation rehabilitation needs to be carried out when the Irrigation Network Condition Index is 60%, while above that value, maintenance is carried out with the following classification:

a) If the irrigation network condition index is greater than 90%, routine maintenance is carried out.
b) If the irrigation network condition index is 80–90%, periodic maintenance is carried out.
c) Irrigation Network Condition Index: 60–80%; carried out minor rehabilitation or special maintenance (formerly known as special maintenance).

Use the Guidelines for Procedures and Work Instructions for Measurement of River Debit and Open Canal No. QA/HDR/03/2009 issued by the Department of Public Works, Director General of Water Resources, 2009 for river or drainage measurement and planning activities.

The guideline stipulates the length and time period of the measurement, the equipment used, and the human resources needed, so that the costs needed in measuring and planning the river/drainage can be calculated which is:

1. From the DAK data for 2022 and the draft proposal for 2023, it can be seen that the work on water resources in the irrigation sector that is often carried out is:
2. Repair of primary and secondary channels
3. Weir wing repair

4. Channel normalization (walled dredging)
5. River bank repair
6. Repair of water gates.

For sluice activities, each irrigation area has different characteristics depending on the width of the canal, so it is difficult to establish a standard.

Table 1. List of ASB SDA analysis results

| No | Type of Activity | Cost before tax /m' | Cost after tax 11%/m' |
|---|---|---|---|
| **1** | Repair of canal levitation with a height of 2 m and a slope of 1: 2.5. (ex demolition reuse) | Rp. 2.621.277 | Rp. 2.910.000 |
| **2** | Repair of channel walls H = 1.5 m, slope 1: 1 (re-used demolition) | Rp. 1.137.503 | Rp. 1.263.000 |
| **3** | Repair of canal walls H = 1.25 m , slope 1 : 2.5 (re-use demolition) | Rp. 1.138.949,69 | Rp. 1.265.000,00 |
| **4** | Repair of H channel walls = 1 m (re-use demolition) | Rp. 912.140,00 | Rp. 1.013.000,00 |
| **5** | Repair of H channel walls = 1.5 m (re-used demolition) | Rp. 1.117.089,00 | Rp. 1.240.000,00 |
| **6** | Repair of H channel walls = 2 m (re-use demolition) | Rp. 1.420.462,00 | Rp. 1.577.000,00 |
| **7** | Construction of talud height (H) = 0.6 m | Rp. 1.609.880,00 | Rp. 1.787.000,00 |
| **8** | Construction of talud height (H) = 0.8 m | Rp. 2.028.850 | Rp. 2.253.000,00 |
| **9** | Construction of talud height (H) = 1.0 m | Rp. 2.300.770,00 | Rp. 2.554.000,00 |
| **10** | Construction of talud height (H) = 1.2 m | Rp. 2.896.200,00 | Rp. 3.215.000,00 |
| **11** | Construction of talud height (H) = 1.5 m | Rp. 2.242.215,00 | Rp. 2.489.000,00 |
| **12** | Construction of talud, height (H) = 2 m slope type 1:1 length 1m' | Rp. 2.811.727,50 | Rp. 3.122.000,00 |
| **13** | Construction of talud, height (H) = 2,5 m slope type 1:1 length 1m' | Rp. 3.799.721,00 | Rp. 4.218.000,00 |
| **14** | Construction of talud, height (H) = 3 m slope type 1:1 length 1m' | Rp. 4.544.145,00 | Rp. 5.045.000,00 |
| **15** | Construction of talud height (H) = 1.5 m type slope 2:1 length 1m' | Rp. 2.520.139.5 | Rp. 2.798.000,00 |
| **16** | High talud construction (H) = 2 m slope type 2:1 1m long | Rp. 3.597.833,50 | Rp. 3.994.000,00 |
| **17** | Construction of high talud (H) = 2.5 m type slope 2:1 1m long | Rp. 4.430.487,50 | Rp. 4.918.000,00 |
| **18** | High talud construction (H) = 3 m type slope 2:1 length 1m' | Rp. 5.861.986,5 | Rp. 6.507.000,00 |
| **19** | Repair intake width 0.8 m high 1 m long 1m' | Rp. 1.076.024 | Rp. 1.195.000,00 |
| **20** | Repair of gutter walls with concrete lining, slanted side length of 1.6 m per m' | Rp. 2.153.999.19 | Rp. 2.391.000,00 |
| **21** | Operation and Maintenance (OM) Costs for lubrication of lifting gate type sluice per piece | Rp. 21.021,60 | Rp. 23.100,00 |
| **22** | OM costs for the lubrication of wooden sluice gates with single handlebar gears < 1m per piece | Rp. 34.096,80 | Rp. 37.500 |
| **23** | OM costs for lubricating wooden sluice gates with double handlebar gears < 1m per piece | Rp. 51.779,40 | Rp. 56.900,00 |
| **24** | OM fee for lubricating a wooden sluice gate with a single handlebar gear is 1-2 m per piece | Rp. 50.850,20 | Rp. 55.900,00 |
| **25** | OM costs for the lubrication of wooden sluice gates with double handlebar gears of 1-2 m per piece | Rp. 84.146,90 | Rp. 92.500,00 |
| **26** | OM costs for the lubrication of wooden sluice gates with single handlebar gear > 2 m per piece | Rp. 82.524,60 | Rp. 90.700,00 |
| **27** | OM costs for lubricating wooden sluice gates with double handlebar gears > 2 m per piece | Rp. 131.574,5 | Rp. 144.700,00 |
| **28** | OM costs for the lubrication of steel sluice gates with single handlebar gear < 1m per piece | Rp. 51.672.4 | Rp. 56.800,00 |
| **29** | OM costs for the lubrication of steel sluice gates with double handlebar gears < 1m per piece | Rp. 85.869,10 | Rp. 94.100,00 |
| **30** | The OM fee for lubricating steel sliding gate type with single handlebar gear is 1-2 m per piece | Rp. 84.324,9 | Rp. 92.700,00 |
| **31** | OM costs for the lubrication of steel sliding doors with double handlebar gears 1-2 m per piece | Rp. 134.375,00 | Rp. 147.800,00 |
| **32** | OM costs for the lubrication of steel sluice gates with single handlebar gear > 2 m per piece | Rp. 132.574,7 | Rp. 145.800,00 |
| **33** | OM costs for the lubrication of steel sluice gates with double handlebar gears > 2 m | Rp. 214.721,20 | Rp. 236.100,00 |

| No | Type of Activity | Cost before tax /m' | Cost after tax 11%/m' |
|---|---|---|---|
| | per piece | | |
| **34** | River embankment repair 10 m high per m' | Rp. 30.433.336,71 | Rp. 33.781.000,00 |
| **35** | Cost of dredging sediment (sludge) manually per m3/m' | Rp. 160.212,00 | Rp. 176.200,00 |
| **36** | Building Improvements measuring 1.1 m wide and 1.75 m/m high | Rp. 4.464.945,00 | Rp. 4.957.000,00 |
| **37** | Asset Management and Irrigation System Performance (PAKSI) in DI area < 3000 Ha | Rp. 120.000,00/Ha | Rp. 132.000/ha |

The standard analysis of expenditure in the infrastructure sector is different from the analysis of spending in other sectors. This is because the infrastructure sector has regulations or unit price analysis standards that have been determined by the government as an example of one of the standard expenditure analyses for the repair of a canal with a height of 2 m and a slope of 1: 2.5 per m'. The cost objects of this activity are the construction of a 2 m channel with a slope of 1: 2.5 per m'. To achieve the goal of building the talud, activities are needed in the form of 1. Preparatory work. 2. Soil excavation work for the foundation. 3. Stone masonry work. while the activity driver is the volume of each activity, the unit of volume, and the work unit price of the activity. the amount of costs for labor and material needs are adjusted to the standards in force in the area by adding an inflation rate of approximately 3%. For inflation, data is taken from the Central Statistics Agency or data from the Ministry of Finance. The activities in the standard infrastructure cost analysis are independent variables and there are no fixed variables shown in Figure 2.

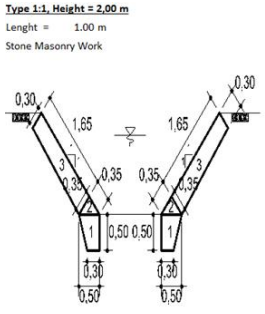



Figure 3. Samping of design

## Conclusion

Expenditure Standard Analysis (ASB) needs to be prepared to determine the regional budget used in a program or activity to produce a certain level of service and the reasonableness of costs in work units in one fiscal year. The preparation of ASB in the field of water resources has special characteristics because it relates to natural and environmental conditions, so that ASB in the field of natural resources is dynamic and unique to each blood group. Updating the preparation of the ASB needs to be reviewed annually to adjust for rising costs and inflation that occur each year. Cooperation between fields is needed for data collection as a basis for preparing the ASB.

The ASB used in the field of water resources is determined based on the activities most frequently carried out by the Technical Implementation Unit, namely: repair of embankments, construction of embankments, operation and maintenance of water gates as well as asset management and irrigation performance.

## References

Adams, M. (1996). Activity-based costing (ABC) and the Life Insurance Industry. *Service Industries Journal*, *16*(4), 511–526.

Ahmad, A. W., Misra, F., & Rosalina, E. (2013). Penyusunan Analisis Standar Belanja Sebagai Pedoman Penerapan Value For Money dalam Penganggaran pada Pemerintah Daerah: Kasus Belanja Kegiatan Pelatihan. *Prosiding Simposium Nasional Akuntansi Vokasi Ke*, *2*, 96–111.

Back, W. E., Maxwell, D. A., & Isidore, L. J. (2000). Activity-based costing as a tool for process improvement evaluations. *Journal of Management in Engineering*, *16*(2), 48–58.

Basri, F. H. (2005). Tantangan dan Peluang Otonomi Daerah. *Universitas*.

Cooper, R., & Kaplan, R. S. (1991). Profit priorities from activity-based costing. *Harvard Business Review*, *69*(3), 130–135.

Culmo, M. P., Sadasivam, S., Gransberg, D. D., Boyle, H., Deslis, A., Duguay, W., Rose, D., Mizioch, C., & Mallela, J. (2013). *Contracting and Construction of ABC Projects with Prefabricated Bridge Elements and Systems*. United States. Federal Highway Administration.

Duran, O., & Afonso, P. S. L. P. (2020). An activity based costing decision model for life cycle economic assessment in spare parts logistic management. *International Journal of Production Economics*, *222*, 107499.

Elghaish, F., & Abrishami, S. (2021). A centralised cost management system: exploiting EVM and ABC within IPD. *Engineering, Construction and Architectural Management*, *28*(2), 549–569.

Er, A. C., Selvadurai, S., Ardieansyah, A., & Jusoh, H. (2011). Pembangunan Perindustrian dan Impak Terhadap Ekonomi Lokal di Dumai, Riau, Indonesia. *Jurnal of Social Sciences and Humanities, Universiti Kebangsaan Malaysia*.

Fang, Y., & Ng, S. T. (2011). Applying activity-based costing approach for construction logistics cost analysis. *Construction Innovation*, *11*(3), 259–281.

Gosselin, M. (2006). A review of activity-based costing: technique, implementation, and consequences. *Handbooks of Management Accounting Research*, *2*, 641–671.

Kaiser, M. J. (2019). The role of factor and activity-based models in offshore operating cost estimation. *Journal of Petroleum Science and Engineering*, *174*, 1062–1092.

Kaplan, R. S., & Anderson, S. R. (2003). Time-driven activity-based costing. *Available at SSRN 485443*.

Karianga, H. (2017). *Carut-Marut Pengelolaan Keuangan Daerah di Era Otonomi Daerah*. Prenada Media.

Kaukab, M. E. (2019). Implementasi activity-based costing pada UMKM. *Journal of Economic, Management, Accounting and Technology*, *2*(1), 69–78.

Krishnan, A. (2006). An application of activity based costing in higher learning institution: A local case study. *Contemporary Management Research*, *2*(2), 75.

Legowo, T. A. (2005). Pemilihan Kepala Daerah secara langsung, Good Governance dan Masa depan otonomi daerah. *Jurnal Desentralisasi*, *6*(4), 1–13.

Li, F., Xianyi, G., & Xin, M. (2012). On reasons of uncontrollable construction cost based on the ABC analysis method and the complete decomposition model. *Systems Engineering Procedia*, *4*, 359–365.

Liberatore, M. J., Miller, T., & Liberatore, M. J. (1998). A Framework for Integrating Activity-based Costing and the Balanced Scorecard. *Journal of Business Logistics*, *19*(2), 131–154.

Lou, Y.-I., & Wang, H. C. (2013). Design and implementation of activity-based costing in a communication company. *International Journal of Business and Management*, *5*(8), 28–33.

Mardhiah, N. (2017). Identifikasi Tujuan dan Sasaran Pembangunan Desa Kabupaten Aceh Barat. *Jurnal Public Policy*, *3*(1).

Mignone, G., Hosseini, M. R., Chileshe, N., & Arashpour, M. (2016). Enhancing collaboration in BIM-based construction networks through organisational discontinuity theory: a case study of the new Royal Adelaide Hospital. *Architectural Engineering and Design Management*, *12*(5), 333–352.

Moonti, R. M. (2019). Regional Autonomy in Realizing Good Governance.

*Substantive Justice International Journal of Law*, *2*(1), 43–53.

Noviades, D. (2013). Pengelolaan Keuangan Daerah Di Era Otonomi Daerah. *Jurnal Ilmu Hukum Jambi*, *4*(1), 43294.

Rahmaji, D. (2013). Penerapan activity-based costing system untuk menentukan harga pokok produksi PT. Celebes Mina Pratama. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, *1*(3).

Rochmansjah, H. (2019). Impact Regional Autonomy in Improving Public Services Quality. *International Journal of Science and Society*, *1*(2), 173–180.

Rotikan, G. S. (2013). Penerapan metode activity based costing dalam penentuan harga pokok produksi pada PT. Tropica Cocoprima. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, *1*(3).

Rundora, R., Ziemerink, T., & Oberholzer, M. (2013). Activity-based costing in small manufacturing firms: South African study. *Journal of Applied Business Research (JABR)*, *29*(2), 485–498.

Salawu, R. O., & Ayoola, T. J. (2012). Activity based costing adoption among manufacturing companies in Nigeria. *Journal of Modern Accounting and Auditing*, *8*(1), 40.

Salim, A., Fadilla, F., & Purnamasari, A. (2021). Pengaruh Inflasi Terhadap Pertumbuhan Ekonomi Indonesia. *Ekonomica Sharia: Jurnal Pemikiran Dan Pengembangan Ekonomi Syariah*, *7*(1), 17–28.

Schulze, M., Seuring, S., & Ewering, C. (2012). Applying activity-based costing in a supply chain environment. *International Journal of Production Economics*, *135*(2), 716–725.

Sommaliagustina, D. (2019). Implementasi otonomi daerah dan korupsi kepala daerah. *Journal of Governance Innovation*, *1*(1), 44–58.

Syafputro, E., & Ibrahim, M. (n.d.). OPTIMALISASI APBD DALAM PERSPEKTIF PERFORMANCE BUDGET. *Jurnal Kebijakan Publik*, *4*(01), 73–80.

Tran, U. T., & Tran, H. T. (2022). Factors of application of activity-based costing method: Evidence from a transitional country. *Asia Pacific Management Review*, *27*(4), 303–311.

Tri Asmorowati E, S. . (2021). Perencanaan Perhitungan AKNOP Pada Daerah Irigasi Mrican Sebagai Upaya Peningkatan Kinerja Irigasi. *Cantilever:Jurnal Penelitian Dan Kajian Bidang Teknik Sipil*, *10*(1), 11–17.

Tsai, W.-H., Lan, S.-H., & Huang, C.-T. (2019). Activity-based standard costing product-mix decision in the future digital era: green recycling steel-scrap material for steel industry. *Sustainability*, *11*(3), 899.

Utomo, C., Indriyani, R., Rohman, M. A., Nurcahyo, C. B., & Putri, Y. E. (2022). Model Pelatihan Inovasi Manajemen Biaya untuk Ketangguhan Usaha UMKM Konstruksi. *Sewagati*, *6*(4), 463–469.

Vetchagool, W., Augustyn, M. M., & Tayles, M. (2020). Impacts of activity-based costing on organizational performance: evidence from Thailand. *Asian Review of Accounting*, *28*(3), 329–349.

Yusuf, M., Rahmawati, R., & Aswar, A. (2020). Penyusunan Analisis Standar Belanja Pembangunan Gedung Dan Rehabilitasi Ruang Kelas Lingkup Pemerintah Kabupaten Buton Tahun 2019. *RESONA: Jurnal Ilmiah Pengabdian Masyarakat*, *3*(2), 58–65.

Zhao, P. A., & Wang, C. C. (2014). A comparison of using traditional cost estimating software and BIM for construction cost control. In *ICCREM 2014: Smart Construction and Management in the Context of New Technology* (pp. 256–264).

Zulfikar, M., Ulupui, I. G. K. A., & Gurendrawati, E. (2020). Pengaruh, Inflasi, Pertumbuhan Biaya Konstruksi, Nilai Tukar, dan Suku Bunga terhadap Gross Profit Margin (GPM). *Jurnal Akuntansi, Perpajakan Dan Auditing*, *1*(2), 249–262.