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TIME-DRIVEN ACTIVITY-BASED COSTING (TDABC) AND STRATEGIC DECISION-MAKING IN ECONOMIC ENTERPRISES – A CASE STUDY OF ALGÉRIE TELECOM, DJELFA AGENCY–

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Abstract:
This study aims to illuminate and evaluate the Time-Driven Activity-Based Costing (TDABC) method, recognized as a modern approach in cost accounting. The objective is to underscore its efficacy in bolstering strategic decision-making within economic enterprises by facilitating cost reduction, enhancing competitive advantage, and improving product quality. To substantiate this investigation, the TDABC methodology was applied within the commercial department of Algérie Telecom, Djelfa Agency.
Key findings from the study indicate that the TDABC approach yields more reliable and pertinent information for strategic decision-making within economic enterprises by incorporating time equations and emphasizing the concept of idle capacity. This, in turn, enhances the strategic clarity of cost trajectories and contributes to product quality improvement and competitive advantage development. Additionally, TDABC enables the reduction of service costs at Algérie Telecom, Djelfa Agency by identifying and excluding the costs associated with unused capacities (idle time) from service cost calculations.

Keywords: Time-Driven Activity-Based Costing (TDABC), strategic decision-making, cost reduction, competitive advantage, product quality improvement, economic enterprises.
JEL Classification : M49, M41

Introduction :

Cost accounting systems are foundational to economic enterprises, underscoring their significance by providing critical information to financial decision-makers. The heightened focus on cost management, recognized as a pivotal determinant of organizational efficiency, has necessitated a reexamination of traditional cost accounting methodologies. These conventional approaches have been extensively critiqued for their lack of precision, which undermines the integrity of accounting information. In response, contemporary cost accounting methods have been developed, aimed at delivering accurate and pertinent data to inform decision-making processes and adapt to the evolving business landscape. This paradigm shift has redefined the role of cost accounting from a purely computational function to a strategic one. Consequently, the Activity-Based Costing (ABC) method has emerged, demonstrating its efficacy in providing valuable insights into indirect cost allocation.
Despite the widespread adoption of Activity-Based Costing (ABC), it has faced considerable criticism for being unsuitable for complex activities and costly to implement in dynamic environments. In response, Kaplan and Anderson introduced the Time-Driven Activity-Based Costing (TDABC) method. This innovative approach aims to develop a robust mathematical

model capable of accommodating contemporary organizational variables by relying on scientific and theoretical foundations. TDABC employs time equations to precisely calculate costs, enhancing the accuracy and relevance of cost-related information.

In economic enterprises, decision-making is a crucial process, intrinsically tied to top management and influenced by a myriad of internal and external factors. Among these, strategic decisions stand out as paramount, guiding the enterprise towards achieving its core objectives.

Cost accounting systems, particularly modern methodologies like TDABC, are instrumental in supporting strategic decision-making. These systems significantly contribute to the strategic trifecta of cost reduction, competitive advantage enhancement, and product quality improvement.

1.1 Research Problem:

Based on the aforementioned discussion, the primary research problem can be formulated as follows:

To what extent does Time-Driven Activity-Based Costing (TDABC) support strategic decision-making in economic enterprises?

To address this problem and provide a clearer understanding, we propose the following sub-questions:

- How does the implementation of the TDABC method contribute to cost reduction in economic enterprises?
- To what extent does the application of the TDABC method enhance the competitive advantage of economic enterprises?
- How significantly does the application of the TDABC method improve product quality?

1.2 Research Hypotheses:

This study is based on the primary hypothesis that the application of Time-Driven Activity-Based Costing (TDABC) plays a significant role in supporting strategic decision-making in economic enterprises. From this main hypothesis, the following sub-hypotheses are derived:

First Hypothesis: The application of Time-Driven Activity-Based Costing (TDABC) contributes to cost reduction in economic enterprises.

Second Hypothesis: The use of Time-Driven Activity-Based Costing (TDABC) enhances the competitive advantage of economic enterprises.

Third Hypothesis: The implementation of Time-Driven Activity-Based Costing (TDABC) improves product quality in economic enterprises.

1.3 Research Significance:

The significance of this study arises from its focus on:

- Addressing a gap in the literature by linking modern cost accounting methods, specifically Time-Driven Activity-Based Costing (TDABC), with strategic decision-making.
- Highlighting the importance of TDABC as a contemporary accounting technique, which significantly aids enterprises in enhancing efficiency and effectively managing costs with precision, thereby facilitating optimal resource utilization.
- Assessing the impact of TDABC implementation on supporting strategic decision-making.

1.4. Research Objectives:

The primary objectives of this study can be summarized as follows:

- To explore the fundamental concepts of Time-Driven Activity-Based Costing (TDABC) as a modern approach in cost accounting.

- To examine the nature of strategic decision-making processes within economic enterprises.
- To analyze and elucidate the impact of TDABC implementation on supporting strategic decisions in economic enterprises through cost reduction, enhancement of competitive advantage, and improvement of product quality.

1.5. Research Methodology:

To fulfill the aims of this study, a descriptive analytical methodology was adopted. This entailed a comprehensive review of pertinent literature on Time-Driven Activity-Based Costing (TDABC) and strategic decision-making processes. Additionally, direct interviews and case studies constituted the practical component of this research.

1.6. Literature Review:

Study by Demeere et al. (2009) titled: "Time-Driven Activity-Based Costing in an Outpatient Clinic Environment: Development, Relevance, and Managerial Impact." This research focused on the healthcare sector, aiming to underscore the significance of the TDABC method in both cost accounting and management contexts. The study assessed the applicability of Time-Driven Activity-Based Costing (TDABC) within hospital settings. Results indicated that the insights derived from the TDABC framework substantially improved healthcare managers' and departmental leaders' understanding of various organizational processes.

Study by Abdel Halim Abir (2010) titled: "Evaluating the Time-Based Activity Costing Approach as Applied to the Credit Department of a Branch of the National Bank of Egypt. The objective of this study was to substantiate the importance and necessity of adopting the method along with identifying expected benefits. Findings indicated that the operational capacity accounted for 86% of the theoretical capacity. Thus, the costs attributable to these activities should reflect only 86% of the costs derived from the theoretical capacity as calculated under traditional activity-based costing systems.

Study by Kell et al. (2012): "Time-Driven Activity-Based Costing in Healthcare: A Systematic Review of the Literature." This research sought to investigate the motivations for implementing the TDABC framework within the healthcare sector and how its application corresponds to the seven-step process specifically designed for value-based healthcare (VBHC). The findings highlighted implications for future adoption of TDABC, indicating that its role is still in a developmental stage, with further refinement needed.

Study by Abu Ghaben (2013): "Time-Driven Activity-Based Costing (TDABC) and Its Impact on Profit Distribution Policies of Publicly Listed Companies on Palestine Stock Exchange." This research aimed to assess the influence of TDABC implementation on the profit distribution strategies of publicly listed firms in the Palestine Stock Exchange. The findings indicated a statistically significant positive correlation between the adoption of the TDABC framework and various financial ratios. Importantly, 78% of the surveyed companies reported distributing cash dividends to their shareholders.

Study by Abdallah AbuRahma and Hamad (2019): "Impact of Time-Driven Activity-Based Costing (TDABC) on the Quality of Managerial Decisions: A Case Study of the College of Science and Technology." This research sought to assess the implications of implementing TDABC within the College of Science and Technology. The results demonstrated that TDABC significantly enhanced the quality of managerial decisions by providing precise information that supports informed decision-making processes. Additionally, the method facilitated cost reduction, improved oversight, and contributed to delivering higher-quality services.

In conclusion, although prior research has recognized TDABC as a modern method associated with enhanced managerial decision-making and increased profitability, these

studies have not explicitly explored its link to strategic decision-making. Furthermore, there is a significant gap in the literature concerning the application of this method in the Algerian economic context.

1.7. Research Structure

In light of the preceding analysis, this study will explore the following key themes:

1. Theoretical Framework for Strategic Decision-Making in Economic Enterprises
2. Time-Driven Activity-Based Costing (TDABC) and its role in facilitating strategic decision-making
3. A field study in Algérie Telecom, Djelfa Agency.

2. Theoretical Framework for Strategic Decision-Making in Economic Enterprises

The significance of decision-making within the management of economic enterprises cannot be overstated, with strategic decisions at the heart of administrative processes and serving as the primary mechanism for achieving organizational objectives. Strategic decision-making is inherently tied to the anticipation of future developments across various medium- to long-term contexts. Thus, the relevance of strategic decision-making is crucial for the success, growth, and sustainability of an organization, necessitating its integration into the broader framework of strategic management. This integration effectively links external environmental analysis with the implementation of strategic initiatives.

2.1 Definition of Strategic Decision-Making:

There are several definitions for strategic decision-making. The most prominent ones include:

- A strategic decision is defined as "a decision made at the levels of management, concerning the future of the organization and its external environment. It addresses ambiguous and complex issues and typically spans a long-term goal" (Abu Qahf & Hanafi, 2004, p. 143)
- Strategic decisions are "those choices selected from a range of strategic alternatives that represent the optimal path to achieve the goals of an organization" (Abdel Basset, 2018, p. 59)
- Strategic decisions are "major decisions characterized by high risk, involving multiple functions within the organization. These decisions tend to be rare but have a critical impact on the organization's health and survival. Modern leaders frequently encounter unprogrammed decisions, made in response to poorly defined and largely unstructured conditions, which hold significant long-term implications" (Peterlin .J, Pearse.N, & Dimovski.V, 2015).

2.2 Characteristics of Strategic Decision-Making:

Strategic decisions are distinguished by certain characteristics that differentiate them from routine administrative decisions made within an organization (Idriss Sobhi & El-Ghalibi, 2007, p. 157). They are:

2.2.1 Organizational Level: Strategic decisions are typically the purview of top management, as they require a holistic and comprehensive understanding of the organization's strategic vision. Top management is tasked with formulating strategies that align with the organization's long-term objectives, addressing complex issues that necessitate a high level of insight and foresight.

2.2.2 Time (Long-Term Nature): Strategic decisions exert a long-term influence on the organization's trajectory. When an organization opts to enter a new market or expand its product line, it commits to these strategic initiatives for an extended period. Such decisions inherently involve a long-term commitment that shapes the organization's identity and competitive positioning within the industry.

2.2.3 Future Oriented: Strategic decisions are inherently forward-looking, obliging top management to forecast future environmental conditions and assess potential opportunities

and threats. This orientation towards the future requires aligning these external factors with the organization's internal strengths and weaknesses to create a strategic fit. The resulting decisions shape the organization's future landscape, determining product portfolios, market expansions, competitive strategies, and investment in innovation and technology. Thus, the future orientation of strategic decisions entails setting a course of action that propels the organization from its current state to its envisioned future state.

2.2.4 Organizational Theory: In making strategic decisions, managers acknowledge that the organization functions as an open system composed of interrelated and interdependent subsystems. Strategic decisions impacting one part of the organization, such as the production department, invariably influence other areas, such as the marketing department.

2.2.5 Orientation Toward an Open System: An organization exhibits an open system orientation when its internal operations and functions both affect and are affected by external environmental factors. For example, a sharp decline in birth rates would significantly impact the sales of a company specializing in baby food. Consequently, to ensure long-term success, an organization must consider external environmental factors, including competitors, suppliers, creditors, and government policies, in its strategic decision-making process.

2.2.6 Framework for Middle and Lower Management Decisions: Strategic decisions establish a guiding framework for middle and lower management. These decisions ensure that the actions and decisions at all levels of the organization align with the strategic objectives set by top management, thereby contributing to the overall goals of the organization.

2.2.7 Resource Allocation: Strategic decisions encompass the allocation of critical resources. Such decisions signify the organization's commitment to a series of future projects, necessitating the provision of essential resources to meet the objectives of these initiatives. Thus, implementing strategic decisions requires a deliberate and efficient distribution of these key resources.

2.3 Importance of Strategic Decision-Making:

The significance of strategic decisions can be summarized as follows (Yassin, Jarallah Hamou, Abdul Latif, & Jalal, 2022, p. 538):

- Strategic decisions play a pivotal role in enhancing organizational learning, improving performance, and achieving superior organizational outcomes. They also reduce the likelihood of strategic failure or competitive threats and help forecast future trends for the organization.
- Strategic decision-making confers a competitive edge to the organization.
- They represent the most effective means to accomplish business goals and identify potential risks. It is also a well-defined set of policies and guidelines adhered to by all members of the organization.
- Strategic decisions are instrumental in attaining the long-term sustainability of organizations by fulfilling their specific objectives.
- High-quality strategic decisions based on anticipated outcomes allow organizations to navigate continuous environmental fluctuations effectively.
- Strategic decisions empower leaders to continuously evaluate market conditions from various perspectives.
- They provide a clearer vision regarding which products should be prioritized in the future.

2.4. Dimensions of Strategic Decision-Making:

The dimensions of strategic decision-making can be highlighted as follows:

- Strategic decisions necessitate the use and deployment of substantial organizational resources. This includes the allocation of a significant sum of financial resources,

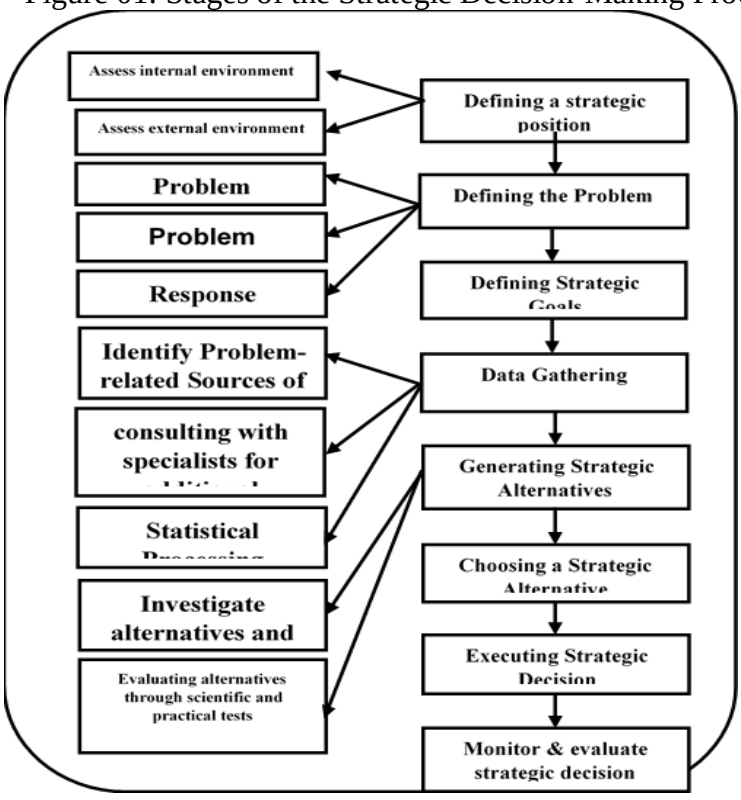
physical assets, and human resources, which must be obtained either internally or externally. These decisions commit the organization to various actions over a relatively defined time period (Mohamed Mokhtar, 2008, p. 15).

- Strategic decisions affect the long-term welfare and prosperity of the organization. They commit the organization to specific directions for extended periods, with implications that last for many years.
- Strategic decisions are characterized by their future orientation, relying on managers' forecasts and focusing on future scenarios. This enables the organization to select the best strategic alternatives.
- Strategic issues require decision-making at the top management level. Since strategic decisions impact various areas of activities and operations, only top management possesses the ability to understand and grasp the broad implications of strategic decisions (Ghalia, 2015, p. 49).

2.5 Stages of the Strategic Decision-Making Process:

The strategic decision-making process involves a series of stages, which can be illustrated as follows:

Figure 01: Stages of the Strategic Decision-Making Process



Source: Authors

3. Time-Driven Activity-Based Costing (TDABC) and Enhancing Strategic Decision-Making

3.1 The Emergence of Time-Driven Activity-Based Costing (TDABC)

Activity-Based Costing (ABC) has been a distinguished method since its inception, offering solutions to cost-related issues that hindered economic enterprises reliant on traditional costing methods. Over time, ABC has effectively enabled enterprises to gain accurate insights into costs and revenues, thereby overcoming the limitations of traditional costing approaches.

Despite its merits, ABC has encountered several notable challenges, including the following (Kaplan . R & Anderson .A, 2007, p. 10):

- The process of conducting interviews and surveys is time-consuming and expensive.
- The data produced by ABC is often subjective and difficult to verify.
- Many ABC models used in firms are partial and fail to provide a holistic view of profitable opportunities and comprehensive company-wide events.
- ABC is theoretically flawed as it overlooks the impact of idle capacity.

To address these deficiencies, consultants in economic units, alongside academics and researchers, endeavored to develop a new paradigm known as Time-Driven Activity-Based Costing (TDABC). In 1997, Professor Anderson, in collaboration with Professor Kaplan, pioneered this approach. In 1998, Anderson and Kaplan referenced TDABC in their publication "Cost-Effect," where they elucidated the methodology's capability to rectify the inefficiencies that enterprises encountered with ABC in cost measurement. TDABC utilizes the time consumed by activities as a foundational metric and streamlines the activity count through the application of time equations.

Regarding its application, Anderson and Kaplan introduced time equations within the TDABC framework in 2001, branding it as an evolved method known as Time-Driven Activity-Based Costing. By 2007, TDABC had been disseminated as a contemporary approach, enabling economic entities to accurately measure product costs. The consulting firm Acorn was the first to adopt this methodology, and it subsequently proven its efficiency across more than 200 companies (Levant & Zimnovith, 2013, p. 19).

3.2 Definition of Time-Driven Activity-Based Costing (TDABC)

The definitions and interpretations of TDABC are diverse, reflecting its comprehensive application in cost management. Here are some of the most notable ones:

- Kaplan and Anderson describe TDABC as "an emerging alternative cost methodology that addresses all the inherent issues and limitations of ABC. It is more straightforward, cost-effective, faster to implement, and facilitates the determination of cost rates and operational metrics based on the practical capacity of available resources" (Alubardy, 2019, p. 230).
- Thomson and Gurowka define it as "a complementary approach to Activity-Based Costing (ABC) but with a minor distinction: ABC measures the cost of products based on both used and idle capacity, whereas TDABC measures the cost of products based solely on used capacity, assigning the cost of idle capacity to income statement" (Al-Shammari & Al-Kishwan, 2018, p. 113).
- Max defines it as "a cost accounting methodology rooted in activity-based costing but incorporating time equations to reflect used capacity. This approach assists organizations in refining pricing strategies for their products" (Max.M, 2007, p. 28).

From these definitions, we can synthesize that:

Time-Driven Activity-Based Costing (TDABC) evolves from and complements Activity-Based Costing (ABC). The fundamental distinction is in the cost measurement: ABC includes both used and idle capacity, while TDABC focuses exclusively on used capacity through time equations. This methodology provides a more precise and transparent depiction of costs, offering enhanced insights for strategic decision-making.

3.3 The Importance of Time-Driven Activity-Based Costing (TDABC)

The significance of TDABC can be delineated through the following dimensions (Kadhim, 2015, p. 271):

- TDABC is renowned for its ease of implementation and flexibility in updating and evolving in response to emergent environmental changes affecting institutional

activities. This flexibility is particularly pertinent in updating cost drivers or expanding the scope of activities.

- TDABC offers a more precise and transparent method for resource allocation by examining the time required for activity execution and juxtaposing it with the actual time expended.
- TDABC is less costly compared to traditional costing methods while offering broader applicability. It efficiently handles a vast array of processes and integrates numerous institutional activities by leveraging cost and time drivers, thereby optimizing cost management.
- TDABC provides accurate insights into idle capacity, aiding in the formulation of more realistic budgetary forecasts and strategic planning. This allows institutions to better anticipate and manage operational complexities and resource demands.

Additional Considerations also include:

- TDABC adeptly links costs to activities and allocates them to products or services based on specific characteristics, while incorporating the crucial time factor. This methodology is adaptable to any complex institution (Kell, 2017, p. 755).
- TDABC demonstrates heightened efficacy through its seamless integration with management information systems, such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) systems. (Saad, Yacoub, & Manel, 2016).

3.4 Components of Time-Driven Activity-Based Costing (TDABC):

The TDABC method is based on the following core elements:

3.4.1 Cost Drivers:

Kaplan defines a cost driver as the activity or variable that induces costs (Kaplan & Anderson, 2012, p. 258). Horngren further elaborates that a cost driver is the principal factor responsible for variations in costs based on its use(Horngren & Harrison, 2012, p. 110).

In the context of TDABC, the procedure starts by estimating the cost of resource capacity through the identification of different resource categories that perform activities(Kaplan & Anderson, 2004, p. 06). Laviana clarifies that cost drivers encompass the aggregate costs associated with personnel, materials, and equipment. The cost of each resource's capacity is determined by dividing the total costs of providing the resources by the available employee time, i.e., standard working hours, thereby excluding idle time or capacity (Laviana & Aaron, 2016, p. 03).

3.4.2 Time Drivers:

Kaplan and Anderson describe time drivers as critical data required for the TDABC method.It involves the estimation of time necessary to execute processes. This estimation is constructed through direct observation or interviews(Kaplan & Anderson, 2004, p. 06). Time drivers are also defined as events or variables that determine the time required to perform an activity, with costs subsequently measured or allocated through time equations. There can be multiple time drivers if the activity encompasses more than one event(Dalci.I, Tanis.V, & Kosan.L, 2009, p. 604).

(Muhammad Akl, 2013, p. 53) categorizes time drivers into three types:

- **Continuous**: Includes measures such as weight or distance in kilometers.
- **Discrete**: Involves counts such as the number of invoices, orders, or production lines.
- **Dummy Variable**: Includes binary indicators such as customer type (new or existing), order type (regular or urgent), or order receipt method (email or fax).

In summary, time drivers are variables or characteristics that determine the time required to perform an activity. They are distinguished by the multitude of time-inducing variables within a single time equation model.

3.4.3 Time Equations

Time equations represent a fundamental component of the TDABC method. They are utilized to articulate the duration required for completing an activity or event based on time drivers, and also serve as a mathematical representation aimed at forecasting the time necessary to execute a specific activity or event according to predetermined conditions that align with the characteristics of that activity (Kaplan & Anderson, 2004, p. 138).

Time equations are formulated as follows (Salman, 2017, p. 306):

$$T_{jk} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots\cdots\cdots\cdots + \beta_n X_n$$

Where:

T_{jk}: Time required to complete event K in activity j.

β_0: Constant term representing the baseline time for activity j pertaining to the characteristics of event K.

β_1: Time consumed or used per unit of the first-time driver.

X_1: Value of the first-time driver relevant to the activity.

X_2:Value of the second time driver relevant to the activity.

X_2: Value of the n time driver relevant to the activity.

n: Total number of time drivers that determine the time necessary for executing the activity.

The cost of the activity is calculated as follows:

Activity Cost = Time Required for the Activity × Cost per Unit ofTime.

Time required for an activity = Time required for every event K within the activity.

Cost of event K for activity j = $T_{jk} \times C_i$

Where:

T_{jk}: Time expended for process K in activity j

C_i: Unit cost of time for resource group i

Thus, total cost = $\sum_{i=1}^{n} \sum_{j=1}^{m} \sum_{k=1}^{i} T_{kj} C_i$

With n being the number of resource pools, m, the number of activities, and i, the number of activity time j used.

The TDABC method, through time equations, accommodates the variance in time demands for different transaction types. It does not simplify assumptions that all transaction activities take the same amount of time; instead, it allows for diverse estimations of activity unit (time) based on demand specifications or activities, in contrast to the traditional approach that requires an expansion in the number of activities to manage complexity and increased manufacturing operations (Faleh Badr, 2012, p. 111).

3.5 Steps-by-Step Implementation of Time-Driven Activity-Based Costing (TDABC):

Implementing the TDABC method and achieving its key objectives involves following a series of steps. These steps are as follows:

(Gao.N & Liv.Z, 2013, p. 90), (Dejnega Olega, 2011, p. 14), (Everaert .p & Bruggeman . w, 2008, p. 15)

3.5.1 Determining Cost Rates for Each Resource Pool:

- **Identifying the total of** resources involved in activities performance.

- **Accumulatingresource poolcosts** associated with each resource pool, typically derived from the company's trial balance.
- **Estimating**the practical capacity for each resource pool.

3.5.2 Estimating the Time Required for the Variables inOngoing Activities (Time Equation):

- **Analyzingdepartmental processes** by breaking down processes within departments into distinct activities.
- **Identifyingtime drivers** via determining the factors that significantly affect the duration of each activity (time drivers). When activities are heterogeneous and comprise multiple tasks (variables), each task will have its own time driver.
- Developing a time equation that captures the relationship between activity time and all relevant factors. The total time consumed is the sum of the time for all tasks (variables) within the activity.

3.5.3 Calculating the Total Resource Costs for Cost Objectives:

This is accomplished by multiplying the cost rates for each resource pool by the total time consumed by each cost objective as it progresses through the various operational activities and their respective time drivers.

3.6 Time-Driven Activity-Based Costing (TDABC) and Improving Strategic Decision-Making:

TDABC enhances the accuracy of product cost data by mitigating the effects of unused resources. This refined information becomes significantly more reliable and pertinent, particularly for strategic decision-making processes.

3.6.1 The Role of TDABC in Cost Reduction:

TDABC helps reduce costs in several ways:

- Elimination of High-Cost Activities : By identifying and eliminating activities that consume excessive time and are costly, TDABC helps streamline operations and reduce overall costs.
- Optimal Cost Allocation: It offers a precise allocation of institutional costs to products using time drivers. By linking the institution's resources to its activities and then distributing them to products, TDABC ensures an accurate measurement of product costs.
- Allocation of Used Capacity Costs: TDABC assigns products the costs associated with the used capacity of activities, excluding the costs of idle capacity from product costs, thereby reducing overall expenses.
- Time Prediction for Activities: Using time equations, TDABC can predict the time required for activities. This assists management in identifying activities that consume more time than necessary and making decisions to reduce the time required, thus lowering costs.
- Identification and Reallocation of Idle Capacity: TDABC identifies idle capacity and reallocates the available resources efficiently, contributing to cost reduction.

3.6.2 Time-Driven Activity-Based Costing (TDABC) and Improving Competitive Advantage

Time-Driven Activity-Based Costing (TDABC) contributes to the competitive advantage of economic enterprises through the following mechanisms (Ben Aouak & Kaddouri, 2020, pp. 244-245):

- Motivating employees and enhancing performance efficiency by identifying the relationship between costs and employees through an understanding of time drivers.
- TDABC helps in identifying idle capacity and redirecting it towards the organization's goals.

- Optimal resource use by linking the costs of resources to the activities consuming them. TDABC contributes to the rationalization of these resourcesby improving efficiency in performing activities, reducing the frequency of execution, and enabling more and better activities with minimal resources.
- TDABC aids in reducing costs and enhancing management control by minimizing the time and effort required for activities, either by eliminating or improving them, and providing better capabilities to eliminate indirect costs.
- integrating with target costing and other information systems, TDABC assists in achieving customer desires in alignment with the institution's strategic paths.
- TDABC promotes effective coordination between purchasing, production, and distribution departments by tracking the institution’s activities and pathways in response to market drivers.
- By analyzing activities and their pathways, TDABC helps in modeling the organization with a horizontal structure, removing barriers between functions and responsibilities, and overcoming the limitations of vertical structuring. This horizontal approach strengthens the institution's competitive position.

3.6.3 Time-Driven Activity-Based Costing (TDABC) and Enhancing Product Quality:

TDABC significantly contributes to the enhancement of product quality in several key ways:

- By reducing the flow of activities within the organization, it directly improves product quality.
- It facilitates the calculation of idle capacity costs, which plays a crucial role in enhancing product quality.

TDABC helps organizations forecast resource requirements more accurately, ensuring a balance in resource capacity and embracing the concept of QATS 'quality at the source.'

- Additionally, it supports making informed decisions regarding production activities, which are instrumental in elevating the overall quality of products.

4. Field Study at Algérie Telecom:

Building upon the theoretical framework that investigated the Time-Driven Activity-Based Costing (TDABC) method and its pivotal role in bolstering strategic decision-making within economic enterprises, this study delves into the practical application of TDABC. Specifically, it focuses on the determinant of cost reduction. Conducted within the commercial department of Algérie Telecom, Djelfa Agency, the study aims to provide empirical evidence on how TDABC can streamline cost management and support strategic initiatives, thereby enhancing the overall decision-making process.

4.1 Activities of the Commercial Department:

Within the operational framework of the commercial department at Algérie Telecom, Djelfa Agency, targeted fieldwork including site visits and operational audits, supplemented by structured interviews with departmental executives, facilitated a granular breakdown of the department's functional activities. This department administers a spectrum of critical business operations, pivotal to the corporation's operational integrity. The activities are segmented into six principal operational roles, staffed by a cohort of 50 personnel in the fiscal year 2019. The deployment of personnel across these operational roles is meticulously detailed in the ensuing table, which articulates the scope of each function and the human capital allocated to these operational tasks.

Table 01: Activities of the Commercial Department and Number of Employees

Commercial Activities	Employees
Invoice Preparation	13
Revenue Collection	07

Transactional Audit	05
Client Service Fulfillment	07
Customer Complaints and Issue Resolution	10
Accounts Receivable Management	08
Total	50

Source: Prepared by the researchers based on simulation methodology using data from Algérie Telecom.

4.2. Determination of Cost Structures for Commercial Department Activities

Upon delineating the scope of activities within the commercial department, this analysis uses the annual financial statementsto ascertain the direct and indirect cost allocations for these activities in the fiscal year 2019.

Table 2: Allocation of Costs within the Commercial Department, Algérie Telecom, Djelfa Agency, 2019

Activities	Direct Costs (1)	Indirect Costs (2)	Total Costs (2+1=3)
InvoicePreparation	353,956.60	2,924,823.09	3,278,779.69
Revenue Collection	589,927.67	4,874,705.15	5,464,632.82
Transactional	235,971.07	1,949,882.06	2,185,853.13
Client Service Fulfillment	235,971.07	1,949,882.06	2,185,853.13
Customer Complaints and Issue Resolution	393,285.11	3,249,803.43	3,643,088.55
Accounts Receivable Management	157,314.05	1,299,921.37	1,457,235.42
Total	1,966,425.57	16,249,017.17	18,215,442.74

Source: Compiled by researchers based on financial statements from Algérie Telecom.

4.3. Assessment of Actual Capacity for Commercial Activities:

The actual capacity is calculated as a percentage of the theoretical capacity, adjusted for non-working periods such as breaks and meetings. Discussions with the department head indicated that the actual capacity typically ranges between 80% and 87% of the theoretical maximum.

Table 3: Estimation of Theoretical and Actual Capacities for Commercial Department Activities, 2019

Activities	Employees	TheoreticalCapacity (minutes)	ActualCapacity Percentage	ActualCapacity (minutes)
InvoicePreparation	13	1,647,360	85%	1,400,256
Revenue Collection	7	887,040	82%	727,373
Transactional	5	633,600	87%	551,232
Client Service Fulfillment	7	887,040	85%	753,984
Customer Complaints and	10	1,267,200	85%	1,077,120

Issue Resolution				
Accounts Receivable Management	8	1,013,760	80%	811,008

Source: Derived from Table No. 01

Theoretical Capacity of the Activity = Number of working minutes per year × Number of employees in the activity = 22 days × 12 months × 8 hours/day × 60 minutes/hour × Number of employees

Actual Capacity = Theoretical Capacity of the Activity × Percentage of Actual Capacity

4.4. Calculation of Unit Costs for Commercial Activities:

The unit cost for the activities of the commercial department is calculated using the following formula:

Unit Cost of Activity = Total Costs of the Activity / Actual Capacity of the Activity

Table 4: Calculation of Unit Costs for Commercial Department Activities, 2019

Activities	Total Costs (USD)	Actual Activity Capacity (minutes)	Unit Cost (USD/minute)
InvoicePreparation	3,278,779.69	1,400,256	2.34
Revenue Collection	5,464,632.82	727,373	7.51
Transactional Audit	2,185,853.13	551,232	3.97
Client Service Fulfillment	2,185,853.13	753,984	2.90
Customer Complaints and Issue Resolution	3,643,088.55	1,077,120	3.38
Accounts Receivable Management	1,457,235.42	811,008	1.80

Source: Calculated using data from Tables No. 02 and 03

4.5. Identification of Cost Drivers for Commercial Department Activities

Upon the delineation of direct and indirect costs associated with departmental activities and the assessment of their actual capacities and unit costs, the subsequent phase involves an analysis of cost drivers. Cost drivers are variables that influence the initiation and volume of activities. The ensuing table illustrates the types of cost drivers associated with each activity, measured by their occurrences.

Table 5: Analysis of Cost Drivers for Commercial Department Activities

Activities	Nature of Cost Driver	Quantity
InvoicePreparation	Number of Customers	80,000
Revenue Collection	Number of Customers	80,000
Transactional Audit	Number of Customers	80,000
Client Service Fulfillment	Number of ProcessedRequests	50,000
Customer Complaints and Issue Resolution	Number of Complaints and Inquiries	35,000
AccountsReceivable Management	Number of DelinquentCustomers	25,000

Source: Developed by researchers utilizing simulation techniques and Algérie Telecom data.

4.6. Quantification of Time Requirements for Activities within the Commercial Department

Table 6: Quantification of Time Allocations for Each Activity within the Commercial Department

Activities	Required Time (minutes)	Number of Cost Drivers	Total Required Time (minutes)
InvoicePreparation	12	80,000	960,000

Revenue Collection	10	80,000	800,000
Transactional Audit	5	80,000	400,000
Client Service Fulfillment	10	50,000	500,000
Customer Complaints and Issue Resolution	25	35,000	875,000
AccountsReceivable Management	20	25,000	500,000

Source: Compiled by researchers using data from Table 5.

4.7. Calculation of Activity Costs via TDABC Methodology

After determining the unit costs for the activities and total required times, we calculate activity costs using the formula: **Activity Cost = Unit Cost × Total Required Time**

Table 7: Calculation of Activity Costs within the Commercial Department for 2019

Activities	Total Required Time (minutes)	Unit Cost (DZD/minute)	Activity Cost (DZD)
InvoicePreparation	960,000	2.34	2,246,400
Revenue Collection	800,000	7.51	6,008,000
Transactional Audit	400,000	3.97	1,588,000
Client Service Fulfillment	500,000	2.90	1,450,000
Customer Complaints and Issue Resolution	875,000	3.38	2,957,500
AccountsReceivable Management	500,000	1.80	900,000
Total	/	/	15,149,900

Source: Developed by researchers using data from Tables 4 and 6.

4.8. Calculation of Cost Reductions Post-TDABC Implementation

This phase aims to ascertain the cost savings achieved by employing TDABC, quantified both in absolute terms and as a percentage, using the following formulas:

Cost Reduction = Conventional Cost – TDABC

CostReduction Percentage = (Cost Reduction / Conventional Cost) × 100

Table 8: Calculation of Cost Efficiencies in Commercial Activities for 2019

Activities	ConventionalCost (DZD)	TDABC Cost (DZD)	Cost Reduction (DZD)	Reduction Percentage
InvoicePreparation	3,278,779.69	2,246,400	1,032,379.69	31.49%
Revenue Collection	5,464,632.82	6,008,000	543,367.18	9.94%
Transactional Audit	2,185,853.13	1,588,000	597,853.13	27.35%
Client Service Fulfillment	2,185,853.13	1,450,000	735,853.13	33.66%
Customer Complaints and Issue Resolution	3,643,088.55	2,957,500	685,588.55	18.82%
AccountsReceivable Management	1,457,235.42	900,000	557,235.42	38.24%
Total	18,215,442.74	15,149,900	3,065,542.74	16.83%

Source: Compiled by researchers based on data from Tables 2 and 7.

From the table above, several observations can be made:

1. The department witnessed a significant cost reduction of 3,065,542.74 DZD following the adoption of TDABC.

2. In 2019, 83.17% of the department's operational capacity was effectively utilized, indicating a high level of productivity.
3. Key activities such as Invoice Preparation, Client Service Fulfillment, and Accounts Receivable Managementdisplayed over 30% in time wastage. This inefficiency signals a pressing need for:
    - A reevaluation of cost structures
    - Assessing and possibly reallocating human resources to maximize efficiency and redirect efforts to more critical, value-adding tasks.
    - Redirecting time resources from underperforming activities to those that offer greater value and return.
4. Revenue collection exceeded its capacity by 9.94%, suggesting employees' motivation.
5. The application of TDABC facilitated a notable 16.83% reduction in costs, substantively bolstering strategic decision-making capabilities within the enterprise.

Conclusion

The integration of cost accounting with strategic decision-making through the application of TDABC represents a transformative approach within modern business practices, emphasizing its vital role in sustaining long-term strategic objectives. The precise and detailed cost information provided by TDABC is pivotal, enhancing the decision-making process in several ways:

Theoretical Insights :

- **Strategic Orientation**: Decisions influenced by TDABC are inherently strategic, characterized by their long-term implications and transformative potential within economic enterprises.
- **Driving Factors**: Cost reduction, competitive positioning, and product quality enhancement stand out as fundamental elements bolstered by strategic financial management.
- **Methodological Simplicity**: TDABC's reliance on just two critical data points—activity time and unit cost—underscores its efficiency and adaptability.
- **Detailed Capacity Analysis**: TDABC provides granular insights into capacity utilization, crucial for adjusting to fluctuating market demands and operational conditions.
- **Precision in Costing**: By focusing on time as a primary cost driver, TDABC achieves a higher level of cost accuracy, enhancing budgetary control and financial planning.

Empirical Outcomes:

- **Cost Management**: At Algérie Telecom, Djelfa Agency, TDABC has proven effective in reducing service costs by identifying and eliminating expenditures associated with underutilized capacities.
- **Operational Streamlining**: The method has enabled better management of time and resources, particularly by highlighting activities that do not contribute optimally to organizational goals, thereby facilitating strategic realignment.
- **Capacity Optimization**: Implementing TDABC has been instrumental in quantifying and maximizing the utilized capacity within the commercial department, thereby reducing inefficiencies and bolstering overall departmental performance.

Conclusion

The integration of cost accounting principles, particularly through the TDABC method, into strategic decision-making represents a transformative approach that significantly enhances the long-term operational and strategic agility of enterprises. This study's theoretical and empirical findings can be summarized as follows:

Theoretical Findings:

1. Decisions influenced by TDABC are inherently strategic, characterized by their long-term implications and transformative potential within economic enterprises.
2. Cost reduction, competitive positioning, and product quality enhancement stand out as fundamental elements bolstered by strategic financial management.
3. The TDABC method requires only two key pieces of information: the time needed to perform activities and the unit cost of each activity.
4. TDABC provides granular insights into capacity utilization, crucial for adjusting to fluctuating market demands and operational conditions.
5. By focusing on time as a primary cost driver, TDABC achieves a higher level of cost accuracy, enhancing budgetary control and financial planning.
6. Through the elucidation of idle capacities and the application of time equations, TDABC enhances the strategic cost trajectory, contributing effectively to both product quality and competitive advantage.

Empirical Findings:

1. At Algérie Telecom, Djelfa Agency, TDABC has proven effective in reducing service costs by identifying and eliminating expenditures associated with idle capacities (time wastage).
2. The method has enabled better management of time, particularly by highlighting activities that do not contribute optimally to organizational goals, thereby facilitating strategic realignment.
3. Implementing TDABC has been instrumental in quantifyingthe actual used capacity and highlighted areas of time wastage

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