

# Modeling Social Responsibility Costs in Academic Healthcare: An Integrated ABC And Strategic Management Accounting Framework

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**Abstract:** Subsidized community outreach together with clinical training makes the cost management of academic healthcare institutions more complicated. This is because, in the Consulting Clinics of the College of Dentistry at the University of Thi-Qar, there is no separate costing system for community services. This deficiency unintentionally transforms the social responsibility of the establishment into hidden risk to its financial sustainability. Therefore, in this research, a descriptive analytical model is proposed to address this issue by integrating Activity-Based Costing (ABC) with Strategic Management Accounting (SMA) In the five major treatment categories, checking the model against 2025 data reveals significant accounting differences due to conventional volumetric cost allocation approaches. Basic services, such as X-rays (S4), are high-cost areas in the old metrics and low-cost areas in yours. More complicated interventions, such as dental procedures (S5), are the inverse. The actual cost of dental services was 52,397 dinars, over three times the conventional wisdom figure of 17,547 dinars. The model further showed a 'true support gap' that revealed the burden of uncompensated social responsibility on the university to be 33,679,730 Iraqi dinars. These results make it clear that the measurement of 'non-pricing costs' gives management a very important tool for digital governance, helping in the negotiation of funds and the long-term sustainability. With these results it is highly recommended that the model be adopted and automated time tracking systems be implemented to reduce distortions in costs..

**Keywords:** Strategic Management Accounting (SMA), Activity-Based Costing (ABC), Social Responsibility Burden, Non-Pricing Cost Framework, Cost Distortion, Cross-Subsidization.

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## 1. Introduction

Recent shifts in accounting philosophy have brought about a huge change in the role and rules of management accounting. The change is motivated by the failure of traditional financial indicators to meet the sustainability requirements of a diverse and dynamic marketplace. More specifically, abstract financial metrics do not provide suitable guidance for operational and strategic decision-making, particularly within non-profit service organizations like healthcare and educational institutions.

Strategic management accounting emerged as an evolution in the knowledge-application gap, focusing on non-financial measures and proactive indicators beyond the firm to include environmental and social aspects. Today, as the world is progressively serious in redefining social responsibility from 'sunken costs' or formality to an accountable 'strategic investment,' the very responsibility has gained both organizational and philosophical importance within governmental and educational institutions, sharply contrasting with that in the private sector. While profit-making entities use corporate social responsibility mainly as a tool to boost their public image, public universities have a completely different perspective and role toward the same. For them, it is "utter to the core of their existence and their fundamental mission" to generate public value.

But such a philosophy faces difficult real-world problems in implementing it in a dental school. For dental schools, this would be an additional layer of complexity, a "funding-service paradox" as the authors describe it. After all, they do provide community health services, at low prices to large segments of the population.



Take, for example, consulting clinics related to Iraqi universities, especially those at the College of Dentistry, University of Thi-Qar. These clinics apply transparent social pricing. They charge for services at costs much lower than that of market competitors and, therefore, reflect their ethical and social responsibilities. However, this information deficiency is at loggerheads with a commitment to ethical and social values, because the present method relies on conventional cost allocation. The method currently in use depends on a simple volumetric distribution, for example, the total number of cases treated, without consideration for the vast differences in time, effort, and material resources on different cases.

That accounting gap does not reflect the true financial consequences of social responsibility and also provides misinformation for financial planning. This places the management of the College of Dentistry's consulting clinics at the University of Thi-Qar at risk of not being able to pay their bills since the decisions on their support management are based on arbitrary estimates with no numerical support. This thus makes very clear the urgent need for cost engineering in these consulting units through the implementation of Activity-Based Costing (ABC) as a tool of the strategy in management accounting.

This study does not intend to adopt the system in the traditional way of pricing services but rather to evaluate the "cost of non-pricing," which is sometimes called the "support gap." The Activity-Based Costing (ABC) system assists in mixing detailed tracking and accounting of resource consumption with the strategic side of management accounting. It splits complicated indirect costs and separates educational from social service activities. This unification sets the stage for converting social responsibility from a broad philosophical and theoretical concept into a quantifiable digital governance instrument for financial and strategic planning. Therefore, the College of Dentistry at Thi-Qar University can demonstrate and document the size of its economic contributions as a legitimate bargaining tool to secure additional funding, thereby guaranteeing the sustainability of its developmental role within the local community...

### **1-2 Problem Search**

The College of Dentistry at the University of Thi-Qar applies a clear social pricing policy within its consulting clinics, at which treatment services are offered at markedly reduced prices, much lower than those in the market.

This approach is very important in terms of social responsibility but faces a major information gap. It does not have a detailed cost system that can accurately pin down the actual expenses tied to the service.

Information is a key impediment in decision-making from an administrative viewpoint because, with unclear costs and affordability of the social welfare program, the head of the organization has to decide on its continuity or discontinuation. In either case, long-term social welfare would then become an invisible financial burden, thus leaving the fiscal viability of the Consultancy clinics at haphazard and faulty appraisals. The research problem can be stated as: Can an activity-based costing system appropriately determine the costs of a case treatment and use this information to determine the real value of the support provided by the College of Dentistry, University of Thi-Qar, in discharging its social responsibility?

### **1-3 Importance of The Research**

The importance of this research lies in providing decision-makers (The Fund's Board of Directors, regulatory bodies) with an accurate and justified figure for the cost of social responsibility, which supports future funding requests and guides decisions on whether or not to continue support.

### **1-4 Research Objectives**

1- Analysis and evaluation of the traditional costing system in clinics to diagnose its inability to accurately measure the cost of a case.

2- Design and apply the ABC system to a sample of treatment cases to measure its true cost.

3- Comparing the true cost (ABC) with the socially accepted rate actually adopted for each case in the research sample.

4- Identifying and measuring the Subsidy Gap for each case, which represents the amount of social responsibility adopted by the university.

5- A statement of how this quantitative measurement contributes to transforming social responsibility from a philosophical concept into a manageable and financially plannable strategic tool.

## 1-5 Research Hypotheses

**First hypothesis:** "Applying the ABC system in consulting clinics leads to more accurate measurement of the cost of the treatment case compared to the traditional system."

**Second hypothesis:** "Cost information measured according to the ABC system can be relied upon to identify a clear quantitative support gap between the actual cost and the social price, thus providing an accurate indicator for measuring the burden of social responsibility borne by the university."

## 1-6 Research Methodology

This research relied on the descriptive analytical approach, supported by the case study methodology.

This methodological amalgamation emanates from a philosophy of pragmatism, wherein the value of a theory is placed in its ability to resolve problems of practice. The research was carried out in three phases, which were sequential and integrated.:

### 1<sup>st</sup>: Exploration and Diagnosis

This phase was a field study that took place at The Clinics of The College of Dentistry at Thi-Qar University. It used qualitative tools, including semi-structured interviews with administrators, accountants, and heads of medical departments, direct observation on patient flow, and analysis of official accounting documents and records. Its objectives were to understand the nature of treatment activities in full, map the value stream, and diagnose the inadequacies of the existing traditional costing system with its impact on social pricing decisions.

### 2<sup>nd</sup>: Design and Modeling

The outputs of the first phase facilitated the development of a model for the Activity-Based Costing system to accommodate specific features of the healthcare environment. This phase entailed the identification of resource pools, main and sub-activities, selection of appropriate cost drivers for each activity, and the formulation of mathematical equations for cost allocation in two stages. A purposive sample comprising four common treatment cases of varying complexity (extraction, cosmetic filling, root canal treatment, full crown) was chosen to apply the model since it reflects the most services.

### 3<sup>rd</sup>: Measurement and Comparative Analysis

The designed model was thus implemented using the clinic records from which financial and non-financial data were acquired. In this research sample, the actual cost per case is calculated based on the ABC system. A later stage involves an analysis to compare this cost with that calculated using the traditional system; the social support gap is then measured. The basic equation is:  $(\text{Support Gap} = \text{Total Cost (ABC)} - \text{Approved Social Rate})$ . This gap was then quantitatively analyzed, and its strategic implications for the sustainability of the clinics' social responsibility were interpreted..

## 1-7 Research Boundaries

1. **Spatial Boundaries:** The implementation was directly carried out within the Consulting clinics at the College of Dentistry, University of Thi-Qar. As this location portrays a situation where the features of a government-run academic health unit with an explicit community commitment converge, it was chosen deliberately since this is taken as a "critical case," providing the right conditions for the study of the phenomenon in detail before generalizing the results.
2. **Temporal Boundaries:** The study used financial and operational data for the academic year 2025. This would ensure the use of the most recent completed financial cycle, providing relative stability in the adopted costs and prices.
3. **Thematic Boundaries:** The research concentrated solely on the measurement of the "support gap" as a social responsibility indicator from the cost perspective. In other words, it did not cover measures of beneficiary satisfaction with the service, the social impact on the university's reputation, or long-term health effects of this policy. These dimensions are recommended for future studies.
4. **Sampling Boundaries:** The ABC model was applied to a purposive sample of four treatment cases that best represented the most common and varied procedures in clinics. This methodological choice allowed for accurate and comprehensive tracking of costs but also means that exact numerical results cannot

automatically be extrapolated to the entire college's services without adapting the model, which the researcher recommends doing in future studies.

## **2. Theoretical Framework - Integrating Social Responsibility and Strategic Management Accounting Using The (ABC) System**

### **2-1 Review of Previous Studies**

- 1- studies have focused on moving social responsibility from a theoretical and philosophical framework to a rigorous, quantifiable, and critically quantifiable one within organizations. In this context, a study by (Vedernikova et al. 2022) argued that integrating social responsibility activities into the cost structure enables management to simulate the true cost of sustainability and occupational safety programs.

The study applied the Time-Driven Activity-Based Costing (TD-ABC) system to isolate activities related to social responsibility, and the results proved that tracking the time drivers of these activities reduces cost distortion by up to 12%, providing an accurate decision platform for managers to determine the size of resources directed to society without harming the financial position of the organization.

This vision aligns with global trends that aim to transform social responsibility items from "sunken expenses" to "strategic investments" whose developmental and service returns can be measured.

- 2- The healthcare sector, particularly its academic component, is characterized by complex resource flows and overlapping activities between education and treatment. A study by (Tsai et al. 2020) addressed this complexity by developing a hybrid decision model that integrates activity-based costing (ABC) with multi-criteria decision-making tools in hospitals that have adopted smart and sustainable strategies.

The researchers began with the problem of traditional systems' inability to allocate the indirect costs resulting from service activities associated with treatment. The results showed that restructuring cost centers and transforming them into "activity pools" directly contributes to controlling wasteful costs and accommodating the requirements of sustainable development and social responsibility, without negatively impacting the quality of medical care provided to patients.

This study confirms that accurate cost measurement is the cornerstone of any sustainable community initiative.

- 3- ABC is no longer merely a passive control tool, but has evolved into a primary source of strategic information. This was accurately observed in the systematic survey by (Haricahyo & Rachman, 2026), which traced the evolutionary path of activity-based costing and its relationship to strategic cost management (SCM).

explained that the complex environmental and social challenges facing businesses today have made a "knowledge hybrid" imperative, combining the precision of ABC (Accounting in Business) in allocation with the long-term perspective offered by Strategic Management Accounting (SMA). The study concluded that this integration allows for the measurement of non-financial strategic performance (such as community satisfaction, academic reputation, and ethical responsibility) and its conversion into cost figures that support the organization's long-term survival and competitive advantage.

- 4- Regarding philosophical approaches to the specificity of the economic and organizational environment in Iraq, we find that local accounting literature has begun to witness a growing interest in the need to adapt modern management accounting tools to serve the goals of sustainability and strategic direction. The study by (Farhood & Abd Ali, 2022) focused on the importance of integrating the environmental dimension into the planning system of Iraqi institutions, where the researcher proved that the application of Environmental Management Accounting (EMA) is positively and significantly reflected on the efficiency of strategic budget planning within economic entities (a case study in Wasit Company).

Their study concluded that traditional systems are incapable of providing forward-looking information unless they are supported by strategic techniques that take into account the unforeseen costs associated with environmental and social responsibility.

- 5- Among local studies of non-profit healthcare institutions, a study by (Al-Mousawi & Al-Amiri, 2024) examined the realities and challenges of implementing strategic management accounting techniques in hospitals and health units. The findings indicated an organizational and knowledge gap that hinders the full utilization of modern tools (such as activity-based costing and benchmarking), due to the absence of flexible

structural models that consider the specific characteristics of the public health sector and the severe funding constraints it faces amidst increasing demand for free community services.

## **2-2 The Research Gap and the Location of the Current Study**

Through a review and discussion of previous studies, the research gap can be accurately identified in the following points:

1. The shortcomings of modeling in the academic health sector: Most studies ( Tsai et al., 2020) and ( Vedernikova et al., 2022) focused on for-profit industrial sectors or independent treatment hospitals, while neglecting cost modeling in “academic health units” (such as dental clinics) that face a unique operational situation they consume resources in two simultaneous tracks: (an educational and training track for students that includes errors, repetitions, and natural waste of materials, and a community service track that represents the burden of social responsibility).

2. Despite the scientific importance of the study by (Farhood & Abd Ali, 2022) in tracking the strategic dimensions of sustainability in the local environment, there is a clear applied and sectoral gap separating it from the current research direction. On the one hand, that study focused on the environmental and industrial aspects (profit-driven economic companies such as Wasit Company) and their relationship to planning budgets, while this research focuses on deconstructing the complex social and service aspects within academic health units (the consulting clinics of the College of Dentistry - University of Thi-Qar). On the other hand, their study tracked the impact of strategic systems as a single package on budgets, while the current research seeks to present a detailed integrated construction model that links the flexibility of the activity-based costing ( ABC ) system in identifying and isolating service and educational activities, with the strategic perspective of management accounting ( SMA ) to measure the "cost of non-pricing" as a binding social responsibility burden for the government.

3. The absence of integrated applied frameworks: The accounting literature to the best of the researcher's knowledge, especially in the Arab and Iraqi environment - has not provided an applied model that operationally links the flexibility of (ABC) in limiting the costs of medical and educational activities, and the ability of (SMA). To direct that information to measure the "burden of social responsibility" as a strategic variable affecting the sustainability of the college.

This study was prepared to directly bridge this gap by presenting a proposed integrated model. It is applied practically in the Iraqi environment (Consulting Clinics of the College of Dentistry/University of Thi-Qar), to demonstrate how academic and medical management can use modern cost engineering to accurately measure social burdens, and balance the quality of educational outputs with ethical commitment towards the local community.

## **2-3 Social responsibility in governmental and educational units**

(CSR) This makes the conception acquire philosophical and organizational dimensions that are essentially different from its application in profit-oriented businesses. In the private sector, corporate social responsibility is the maximization of shareholder profit coupled with some moral obligation to society and the environment, for the sake of improving public perception. In Christensen et al. (2024), it is defined as the very "core existence and fundamental mission" of institutions in the public service or education sector.

The public education and healthcare institutions do not aim at generating financial surpluses; they aim at creating "public value." This is why corporate social responsibility (CSR) is seen as a commitment at the structure guided by stakeholder theory, not just a choice or a response to marketing pressures (Adams, 2025)

But there are real-world, down-to-earth problems with this view when it meets the idea of "academic responsibility" in medical colleges. In the same view, a study by (Al-Saeedi, 2025) found that it is the universities and their health units that face the paradox of funding and service, for they are forced to provide efficient and expensive health services to wide sections of the local community, all within a stringent and limited government budget..

This situation transforms social responsibility activities from a mere streamlined service duty into an invisible "strategic and assignment burden" that puts pressure on the operational resources available for the basic educational process.

Dimensions of social responsibility in medical educational units:

- The ethical and service dimension: Providing free healthcare to the local community as a human right and a guarantee of social justice.

- The academic and training dimension: providing a live environment for student training, which generates additional costs resulting from learning errors and reprocessing.

- Structural dimension (funding gap): The absence of direct financial support allocated to social activities, which forces the administration to deduct it from the operational education budget.

Based on the above, studying social responsibility in dental college consulting clinics requires breaking the cognitive link with traditional accounting literature that is unable to monitor these burdens as (Jones & Taylor , 2024) emphasizes the necessity of developing accounting measurement tools within government units to enable management to identify and demonstrate the extent of the sacrifice of resources directed to society.

#### 2-4 Strategic Management Accounting and its Role in Measuring Non-Financial Performance

Contemporary accounting thought has witnessed a radical shift in the philosophy and roles of management accounting information systems. The traditional perspective based on tracking historical financial indicators (such as profitability, cash flows, and cost variances) is no longer sufficient to ensure the survival and sustainability of organizations in a highly complex and dynamic business environment (Oyewo, 2022). This structural deficiency in abstract financial measures—which are described in accounting as lagging indicators that measure past results without the ability to predict the future or guide the present—has been the primary impetus for the emergence and development of strategic management accounting (SMA) as an inevitable response to bridge the knowledge and application gap in the decision environment (Al-Mawali, 2024).

Strategic management accounting (SMA) is distinguished by its superior ability to formulate a future vision that transcends the internal organizational boundaries of the institution to encompass the complex dimensions of the external environment. In this respect, the added value of SMA becomes evident. In its intensive focus on non-financial metrics as proactive and leading indicators for future performance and strategic positioning (Pavlatos & Kostakis, 2022).

In non-profit service environments such as the health and academic sectors, these metrics gain double importance since institutional success here is not measured by financial savings or cash surpluses achieved, but rather by complex, trackable qualitative indicators, such as the efficiency and competitiveness of educational outputs (trained students), the quality of healthcare provided, and the depth of commitment to social responsibility towards the surrounding local environment (Al-Obaidi and Al-Jubouri, 2024).

**Table: The shift in standard philosophy between traditional and strategic management accounting**

Comparison point	Traditional Management Accounting	Strategic Management Accounting (SMA)
Nature of scales	Financial, quantitative, and purely monetary.	A balanced mix of financial and non-financial (qualitative) factors.
Time horizon	Short-term (historical/backward).	Long-term (future-oriented/strategic).
Environmental focus	Internal (operational processes and control).	Internal and external (community, competitors, beneficiaries).
Addressing social responsibility	It is treated as a cost charge or sunk expense.	It is treated as a strategic investment and a vital performance indicator.

Source: Prepared by the researcher

When this analytical perspective is applied to academic health units, it becomes clear that the SMA philosophy provides the most appropriate conceptual framework for untangling the complex evaluative entanglement between educational activities and community-based therapeutic activities. (Pavlatos & Kostakis, 2022) argue that introducing non-financial metrics in hospitals and clinics reduces the organizational gap and helps medical management understand the true causes of quality-related costs.

Measuring non-financial performance in these units requires strategic tools (such as the Balanced Scorecard (BSC) or benchmarking) that work in harmony with modern costing systems. This integration allows for the translation

of intangible dimensions—such as "academic college reputation" or "community satisfaction with free medical services"—into trackable and accountable performance indicators (Al-Mawali, 2024).

Accordingly, strategic management accounting does not merely monitor the cost of medical services, but rather examines the “strategic and societal value” created by those services, making it the ideal tool for diagnosing and measuring the burden of social responsibility and transforming it from a vague ethical commitment into a specific strategic target that is quantifiable and qualitatively comprehensive (Al-Obaidi and Al-Jubouri, 2024).

## **2-5 The Position of Traditional Systems and the ABC System on Social Dimensions: A Comparative Study of Capabilities and Deficiencies**

### **2-5-1 The traditional cost allocation system: obstacles to monitoring social responsibility**

Traditional cost allocation systems rely on simplistic assumptions based on volume -based cost drivers, such as direct working hours, bed occupancy days, or the number of physicians, to allocate indirect costs to medical services (Al-Khafaji, 2025). Despite their limited advantages of ease of implementation, low system operating costs, and minimal computational requirements, they pose a significant obstacle to adopting or supporting corporate social responsibility strategies in academic health units.

The Traditional Costing System is the root of the development of cost accounting, founded on the principle of allocating indirect costs (such as rent, utilities and management salaries) to products or services based on a single allocation base (such as the number of direct labor hours or machine hours) (Horngren et al., 2015).

This system is based on the existence of a causal link between this base and the volume of activity, making it easy to apply and appropriate in a production environment with low product diversity and indirect costs in relation to direct costs (Drury, 2018).

But the traditional system comes with a major flaw in the potential misallocation of product cost, particularly in complex production environments with high indirect costs and diverse production activities. A single allocation base resulted in burdening products that consume the allocation base (such as machine hours) with a disproportionate cost burden, which can affect the level of accuracy in measuring cost and profitability (Kaplan & Atkinson, 2015). Although problematic, traditional systems are still used in many organizations due to their simplicity and low cost in comparison with other systems such as Activity-Based Costing (ABC).

(Horngren, Datar, & Rajan, 2015) in their book (*Cost Accounting: A Managerial Emphasis*) stated that traditional systems helped in simplifying the cost allocation process, but they do not accurately represent the relationship between resources consumed and the products produced, particularly in the current industry. Drury (2018) in his book (*Management and Cost Accounting*) indicated that traditional systems were appropriate in simple production environments producing similar products, but they have become less appropriate as processes have become more complex.

The shortcomings and failures of traditional systems in the context of social responsibility are manifested in the phenomenon of "dry, indiscriminate allocation." These systems fail to distinguish between resources consumed for educational and training purposes (such as the extended time a student spends treating a patient, and the waste of materials resulting from a lack of expertise) and resources actually directed toward serving the community (Baker & Jones, 2024). This deficiency leads to what is known as "cross - subsidization," where free medical services appear to have high operating costs and are financially unviable. This puts pressure on the administration of Thi-Qar University to reduce these services, while the real increase in cost stems from "learning activities," not from the "origin of the community service." Consequently, traditional accounting not only ignores the cost of social responsibility but also presents misleading data suggesting that social commitment poses a threat to the institution's financial solvency.

### **2-5-2 Activity-Based Costing (ABC): Responding to Social Dimensions**

Activity-based costing (ABC) is a structural change in the philosophy of accounting, from the traditional cost center concept to the more dynamic view of activities. The underlying philosophy of the system is based on a simple but strategically very important assumption: "Products or services do not directly consume resources rather, activities consume resources, while services consume activities" (Annala et al., 2025)

In the modern business environment, the ABC system is not only an accurate accounting tool for the allocation of indirect costs, but it has also become a strategic tool through which business management gains a picture and structure of how value is created and how resources are wasted (Popesco et al., 2024).

The system's core concepts revolve around three pillars:

**1- Activity Pools:**

These are the containers in which costs are grouped based on the homogeneity of operations.

**2- Resource drivers:**

which measure the number of resources allocated to each activity.

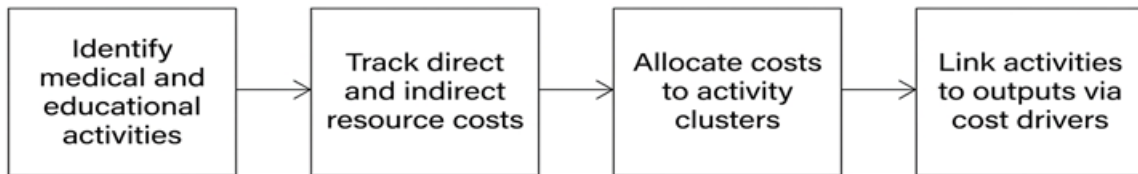
**3- Activity drivers:**

those that link the cost of activities to the final outputs (Cardinaels & Soderstrom, 2024).

This classification gives management the ability to exercise strategic control by distinguishing between value-added and non-value-added activities thus paving the way for rationalizing spending and improving operational efficiency.

**Second: Methodology for implementing the ABC system in the academic health sector**

The healthcare sector, particularly academic units such as dental clinics, is characterized by unique operational complexity due to the overlap between medical treatment pathways and students' clinical training requirements. Implementing the ABC system in these specific environments requires a precise four-step methodology (Manoel & Souza, 2025):



**Steps for implementing ABC in educational clinics**

In the Consulting clinics of Thi-Qar University, the patient is not treated as a "standard production unit," but rather as a clinical pathway consisting of overlapping activities (such as initial file opening, examination and diagnosis, meticulous instrument sterilization, surgical procedures, and academic supervision).

The considerable difficulty in allocating the costs of complex dental equipment, filling materials, sterilization, and supervisors renders the traditional methodology distorting the facts whereas the ABC system ensures the accurate tracking of these indirect costs through real cost drivers (such as dental chair occupancy time or the number of cases treated), providing real data on the consumption of available resources at each output (Popesko et al., 2024).

The Activity-Based Costing (ABC) system came to reformulate the philosophy of allocation by tracking resources in favor of activities first and then allocating activities to service outputs based on the real causes of consumption (Activity/Drivers).

**Table: Evaluating the capabilities and limitations of the ABC system in supporting the measurement of social responsibility**

Advantages of the ABC system in supporting social responsibility	Disadvantages and challenges of the ABC system in the service environment
<p>Isolating intangible activities: This allows for the sorting and identification of activities directed towards the local community (service clinics) and their complete isolation from students' academic training activities.</p>	<p>High design and maintenance costs: It requires a precise and detailed inventory of medical activities, which places a financial and administrative burden on government institutions with restricted budgets.</p>
<p>Accuracy in tracking resource consumption: Eliminates the phenomenon of distorted inter-support thus, showing the true net cost of each free treatment (Cardos et al., 2024).</p>	<p>The need for a flexible data environment: The system faces difficulty in implementation within government hospitals that lack sophisticated</p>

	automation systems to track the times of doctors and supervisors (Manoel & Souza, 2025 ).
Supporting sustainability decisions: It provides senior management with a clear graph of the amount of energy used and not used in achieving social benefits.	Reliance on personal judgment: Cost drivers (especially time-driven ones) may be subject to the personal judgments of nursing staff or doctors during interviews.

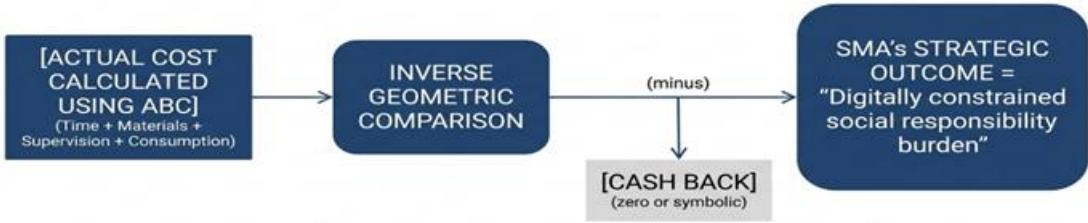
Source: Prepared by the researcher

**2-5-3 The role of the ABC system in measuring the "cost of social support" (the philosophy of non-pricing measurement)**

The classical use of the ABC system in accounting literature has always been to calculate costs for the purpose of "service pricing" or determining patient profitability. In contrast, this research promotes a reverse strategic role for the system: "measuring the cost of non-pricing, " or what is termed "the cost of social support."

In dental clinics, medical services are provided to citizens free of charge or at nominally subsidized prices, representing a tangible application of social responsibility. Traditional accounting fails to capture this sacrifice, merely showing a budget deficit.

However, when the ABC system is applied as a strategic tool, it calculates the full and true cost of each free treatment (including materials, time and operational burdens), and then compares this actual cost consumed with the cash return recovered (which is zero or a symbolic value) (Siti-Nabiha et al., 2025).



**Diagram: The ABC system mechanism for measuring the burden of social responsibility**

The financial difference resulting from this inverse equation is not an "operating loss" resulting from mismanagement, but rather the "unrecoverable cost of social investment".

Using ABC in this way allows the academic administration at the College of Dentistry - University of Thi-Qar to determine the true extent of the social support that the college provides to the community, and provides the Strategic Management ( SMA ) with real and scientifically proven data that demonstrates the extent of the sacrifice of public resources in order to achieve community legitimacy and sustainable governmental commitment ( Cardinaels & Soderstrom, 2024 ).

**3. Research environment and application methodology**

**3-1 Overview of the Consulting Clinics at the College of Dentistry/University of Thi Qar**

The College of Dentistry at Thi-Qar University opened in 2016, joining its sister colleges within the university. In its founding year, it welcomed its first cohort of students, marking the beginning of its journey to provide the community with qualified dentists. From there, it embarked on its academic path, confidently taking steps towards achieving its goals. The college includes the following scientific branches:

- 1- Basic Sciences Branch
- 2- Dental Treatment and Cosmetic Dentistry Branch
- 3- Branch of Oral and Maxillofacial Surgery
- 4- Oral Diagnosis Branch
- 5- Branch of Periodontal Diseases
- Dental Technology Branch

7- Pediatric Dentistry Branch

8- Orthodontics Branch

The educational Consulting clinics at the College of Dentistry, University of Thi-Qar, were officially opened on September 13, 2020. These clinics, built on a 444-square-meter plot, comprise 18 fully equipped clinics for training graduating students and providing free or nominally priced dental treatment to the public. The Consulting clinics offer a range of medical services.

1. tooth extraction
2. filling
3. teeth cleaning
4. X-rays
5. Dental manufacturing

### 3-2 Measuring the cost and burden of social responsibility in consulting clinics

To achieve the research objectives, the actual financial and operational data of the consulting clinics at the College of Dentistry, University of Thi-Qar for the year 2025 was used. The data will be processed in two stages: the first represents the traditional system based on total costing, and the second represents the proposed integrated model using the Activity-Based Costing (ABC) system to determine the true cost, and then integrate it with the perspective of strategic management accounting to measure the burden of social responsibility.

**Table No. (1) Costs of purchasing raw materials for services and prices of subsidized medical services**

No.	Type Of Service	Service code	Cost of purchasing raw materials for the service (direct costs)	Current price of the service	Number of annual cases	Total symbolic revenue achieved (dinars)
1	Tooth Extraction	S1	250,000	2,000	252	504,000
2	Filling	S2	1,000,000	3,000	596	1,788,000
3	Teeth Cleaning	S3	200,000	3,000	422	1,266,000
4	X-Rays	S4	800,0000	2,000	953	1,906,000
5	Dental Manufacturing	S5	500,000	5,000	313	1,565,000
	The Total		9,950,000		2536 cases	7,029,000 Dinar

Source: Prepared by the researcher based on financial data from the Finance Department - College of Dentistry - University of Thi-Qar

#### Overhead Costs:

The shared operational and administrative expenses borne by the college to maintain the operation of the clinics include:

- Supervisors' (doctors') wages: 6 doctors x 500,000 dinars x 12 months = 36,000,000 dinars.
- Assistants' wages: (zero dinars) as students in the final stages are relied upon as part of their training requirements (a strategic feature that reflects the nature of the academic unit).

- Depreciation of devices and equipment: Based on data and a field visit, there are 20 treatment units (dental chairs and accessories) allocated to dentists.
- Supervisors and students, with a purchase price of 250,000 dinars per device, and a lifespan of 6 years (fixed installment):

Total value of devices = 20 devices × 300,000 = 6,000,000 dinars (value of devices)

- Annual depreciation expense = 5,000,000 ÷ 6 years = 1,000,000 dinars. Annual depreciation expense.
- Annual electricity expenses: 3,230,250 dinars.
- Annual maintenance expenses: 219,200 dinars.
- Total indirect costs: 36,000,000 + 1,000,000 + 3,230,000 + 219,200 = 40,430,000 Iraqi dinars.

### 3-2-1 Distributing costs according to the current traditional system

The traditional system in clinics is based on a uniform “volume” basis for distributing indirect costs, which is (total number of cases = 2536 cases), without taking into account the variation in time and effort taken for each service.

Conventional uniform load rate: Load rate = Total indirect costs / Total number of cases = 40,449,200 / 2536 = 15,950 dinars / case

Accordingly, the cost of a single service in the traditional system becomes as shown in Table No. (2):

**Table No. (2) Calculating the cost of services according to the traditional system (based on the size of cases):**

The symbol	Number of cases	The service's share of direct materials (per case)	The case's share of indirect costs	Total cost of traditional service (dinars)
S1	252	250,000 ÷ 252 = 992	15,950	16,942
S2	596	1,000,000 ÷ 596 = 1,678	15,950	17,628
S3	422	200,000 ÷ 422 = 474	15,950	16,424
S4	953	800,000 ÷ 953 = 839	15,950	16,789
S5	313	500,000 ÷ 313 = 1,597	15,950	17,547

By distributing the costs according to the traditional system in Table No. (2), the burden of social responsibility can be measured as shown in Table No. (3).

**Table No. (3) Measuring the burden of social responsibility according to the distribution of costs according to the traditional system**

No.	Service code	Traditional cost (dinar)	Current symbolic price (dinar)	The burden of social responsibility for a single case	Number of annual cases	Total annual social responsibility burden (dinars)
1	S1	16,942	2,000	14,942	252	3,765,384
2	S2	17,628	3,000	14,628	596	8,718,288
3	S3	16,424	3,000	13,424	422	5,664,928
4	S4	16,789	2,000	14,789	953	14,093,917
5	S5	17,547	5,000	54,721	313	3,927,211

					2536 cases	36,169,728
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### 3-2-2 Cost allocation according to the ABC system

To avoid the structural flaws of the traditional system, we propose tracking the flow of costs through actual activities. This can be achieved by dividing indirect costs into two core activities based on the nature of the work in the dental college's consulting clinics:

1. Specialized medical supervision and treatment activities: This includes (physicians' salaries + equipment depreciation) with a total value of 37,000,000 dinars. The proposed cost guide is the "standard time spent in minutes" per case to reflect the degree of medical complexity.

2. Operating activities for therapeutic facilities and environments: This includes (electricity + maintenance) with a total value of 3,449,200 dinars. The cost driver here is the "actual number of cases".

#### A. Calculating Activity Load Rates:

The standard times for each case were estimated in collaboration with the medical staff as shown in Table No. (4) and as follows:

**Table No. (4) Estimated times for each case**

No.	Service Code	Standard Time	Number Of Annual Cases	Standard Annual Time for Cases
1	S1	30 minutes	252	7,560 minutes
2	S2	45 minutes	596	26,820 minutes
3	S3	20 minutes	422	8,440 minutes
4	S4	10 minutes	953	9,530 minutes
5	S5	120 minutes	313	37,560 minutes
			2536 cases	89,910 minutes

Source: Prepared by the researcher based on data from the medical staff in the Consulting clinics of the College of Dentistry – University of Thi-Qar

- **Medical supervision activity load rate:**  $37,000,000 \div 89,910 \text{ minutes} = 412 \text{ dinars/minute}$ .
- **Load rate for facility operation activity:**  $3,449,200 \div 2536 = 1,360 \text{ dinars / case}$ .

#### B. Calculating the true cost per case according to ABC

**Table No. (5) Estimating the cost of the service according to the (ABC) system**

Service code	Current symbolic price (dinar)	Cost of raw materials (dinars)	Cost of medical supervision activity and depreciation	Cost of operating facilities	Service cost according to the ABC system	Number of annual cases	The burden of social responsibility for a single case according to ABC	Total burden of social responsibility
S1	2,000	992	$412 \times 30 = 12,360$	1,360	14,712	252	12,712	2,772,000
S2	3,000	1,678	$412 \times 45 = 18,540$	1,360	21,578	596	18,578	10,239,280
S3	3,000	474	$412 \times 20 = 8,240$	1,360	10,074	422	7,074	2,903,360
S4	2,000	839	$412 \times 10 = 4,210$	1,360	6,409	953	4,409	2,716,050

S5	5,000	1,597	$412 \times 120 = 49,440$	1,360	52,397	313	47,397	15,049,040
						2536 cases		33,679,730

### 3-2-3 Strategic Analysis and Comparison (Measuring the Burden of Social Responsibility)

Herein lies the major cognitive addition of the research as we integrate the outputs of the ABC control system with Strategic Management Accounting (SMA) to demonstrate the extent of the “economic sacrifice directed to society” by the University of Thi-Qar as a measured and administratively justified social responsibility, as shown in Table (6) below.

**Table No. (6) Comparing and identifying cost distortion and the burden of social responsibility**

Service code	Current symbolic price	traditional cost	True Cost (ABC)	Distortion in the traditional system	Distortion case for cost measurement	Significance of the strategic management indicator
S1	2,000	16,942	14,712	2,230	Cost inflation	The burden is traditionally amplified the service is cost-stable.
S2	3,000	17,628	21,578	-3,950	Cost reduction	The actual workload is higher you need to monitor the time of therapy sessions.
S3	3,000	16,424	10,074	6,350	Cost inflation	The cost of the service is low it can be expanded to increase the community return.
S4	2,000	16,789	6,409	10,380	sharp increase in cost	The service achieves high economies of scale its societal burden is low.
S5	5,000	17,547	52,397	-34,850	Sharp cost reduction	of the college's social responsibility.

### 3-2-4 Analysis of applied results and hypothesis testing

The dental clinics at the University of Thi-Qar's College of Dentistry represent a unique model of economic units with dual objectives they strive to create an educational and research environment on the one hand, and provide community services at nominal fees (social responsibility) on the other. This interplay necessitates a fair costing system with sufficient flexibility to differentiate between operational efficiency and the level of economic sacrifice made for the community.

#### 1st : Testing and analyzing the first hypothesis

The hypothesis states: "Applying the ABC system in consulting clinics leads to more accurate measurement of the cost of the treatment case compared to the traditional system."

To prove this hypothesis, we rely on the phenomenon of "cross - subsidization" and the cost distortion resulting from the uniform volumetric allocation in the traditional system, as shown by reading the data in Tables (2) and (6):

#### 1. The Blanket Rate Dilemma:

The traditional system charges all cases a fixed amount of 15,950 dinars, regardless of the nature of the service. This assumption means, from an accounting perspective, that a 30-minute tooth extraction (S1) consumes the same indirect resources as a 120-minute (two-hour) dental procedure (S5), This structural deficiency has led to a significant distortion in the accuracy of cost measurement.

#### 2. The phenomenon of drastic cost reduction (under-costing):

Glaring inefficiency of the old system could be observed in the dental service (S5); its old cost was 17,547 dinars, while the ABC system unveiled its true cost to be 52,397 dinars. This means that the traditional system was underestimating the cost of this service by 36,128 dinars per case; this discrepancy is because the service is of significant time-consuming nature, involving complex medical supervision and equipment wear and tear, a factor captured by the time-driven cost driver in the ABC system..

### **3. The phenomenon of artificial cost inflation (over-costing):**

Conversely, services such as X-rays (S4) and dental cleanings (S3) are overcharged in the traditional system. For example, the actual cost of an X-ray (S4) is 6,409 dinars, while the traditional system displays it as costing 16,789 dinars, resulting in a positive distortion (inflation) of 10,380 dinars. This is due to the high volume of X-ray cases (953 cases annually), which causes the volumetric system to inflate the indirect costs despite the short standard time (only 10 minutes).

#### **1<sup>st</sup>: Conclusion to prove the first hypothesis**

Based on the foregoing, the ABC system successfully deconstructed the critical mass of indirect costs (40,449,200 dinars) and allocated them according to the "activity-based resource consumption philosophy and the service-based activity consumption philosophy." Since the proposed system addressed the distortion The costs range between an inflation of 10,380 dinars and a reduction of 36,128 dinars, so the first hypothesis is considered acceptable and proven practically conclusively.

#### **2<sup>nd</sup>: Testing and analyzing the second hypothesis**

ABC system can be relied upon to identify a clear quantitative support gap between the actual cost and the social price, thus providing an accurate indicator for measuring the burden of social responsibility borne by the university."

The concept of Strategic Management Accounting (SMA) here relates to the ability of senior management at Thi-Qar University to price and present "community benefit" as a strategic achievement to government agencies and the community. By combining the outputs in Tables (3) and (5), the following becomes clear:

#### **1. Identifying the true "support gap" for a single case:**

Adopting strategic decisions based on the traditional system would have led the university to the misleading conclusion that the total social responsibility burden was approximately 35,769,714 dinars. However, when the integrated ABC model was applied, the true strategic gap for each service emerged.

- In the dental services program (S5): The university offers a nominal fee (5,000 dinars), while the actual cost is (52,397 dinars). The gap here (the burden of social responsibility) is (47,397 dinars) per case, not (12,547 dinars) as claimed by the traditional system.
- In the radiology service (S4): The actual burden borne by the university is only (4,409 dinars), while the traditional system inflated this burden and assumed it to be (14,789 dinars).

#### **2. Redirecting the strategic advantage (free student employment):**

From a strategic management accounting perspective, the data reveals a competitive and strategic advantage for the university assistant salaries were zero dinars due to reliance on graduating students. The ABC system maintained this advantage and reflected it in reduced facility operating costs, allowing expenses to be focused solely on "actual medical supervision activities."

#### **3. The total burden actually realized:**

Strategic analysis revealed that the total actual corporate social responsibility (CSR) burden based on activities is 33,679,730 dinars. Although this figure is lower than the traditional estimate, it represents the true, undistorted burden. This indicator provides the college deanship and the university administration with a strategic negotiating tool to secure additional government funding, by demonstrating that each dental manufacturing project (S5) in which the College of Dentistry at Thi-Qar University contributes direct support exceeds 90% of its competitive value in the private market.

#### **Conclusion to prove the second hypothesis:**

Based on the above, the ability of the Activity-Based Costing (ABC) system to provide an accurate structural view of support variances (by comparing the symbolic social price with the real cost) has moved the university's social responsibility from the realm of moral and ethical commitments to a digital value system that is subject to measurement and strategic accountability, which strongly supports the researcher's tendency to accept the second hypothesis and prove its validity in practice.

## 4. Conclusions and Recommendations

### 4-1 Conclusions

Based on statistical processing and in-depth cost analysis of the actual data of the dental clinics at the University of Thi-Qar, a set of pivotal conclusions were reached:

- 1- The traditional system's inability to keep pace with the specificities of academic units: The study revealed the failure of traditional volumetric systems to measure the true cost of educational medical services, due to their reliance on a "uniform load rate" that treats diverse services equally, resulting in a severe accounting distortion that obscured the strategic vision of the university's decision-maker.
- 2- Dismantling the phenomenon of distorted cross - subsidization : The activity-based costing ( ABC ) system proved the existence of substantial deviations in cost accounting where the traditional system practiced an artificial inflation of the cost of services with low numerical density and complexity, such as radiology ( S4 ), while it offered a sharp and misleading reduction in the cost of complex services such as dental manufacturing ( S5 ), which turned out to have a real cost that exceeded three times its traditional book value.
- 3- Establishing the strategic dimension of time as a control tool: Show Cost analysis shows that "standard time taken" is the true and fairest guide for distributing medical supervision and equipment costs, as the ABC system has succeeded in linking resource consumption to the nature of the clinical effort exerted, making the cost per minute (412 dinars) an accurate control indicator for evaluating operational performance efficiency.
- 4- Transforming social responsibility from an abstract value into a governance tool: through the integration of ABC outputs With Strategic Management Accounting (SMA), the research enabled the institutionalization of "social responsibility," transforming it from a purely theoretical concept into quantifiable and accountable support gaps. The total actual burden borne by the university (33,679,730 dinars) was found to be a justifiable financial instrument demonstrating the extent of the economic sacrifice made by the academic institution to serve the community.
- 5- Strategic investment in student efforts: The study proved that the operational structure of the clinics has a unique strategic advantage in eliminating the cost of assistants' wages by employing the skills of graduating students, which represents a strength in reducing fixed costs and directing resources entirely towards the activity of supervision and specialized treatment.

### 4-2 Recommendations

Based on the conclusions drawn, and in order to enhance the role of Thi-Qar University in leading its social responsibility with high economic efficiency, we recommend the following:

- 1- Moving towards the proposed costing model: The financial departments at the Presidency of Thi-Qar University and the Deanship of the College of Dentistry must abandon traditional volumetric mechanisms and adopt the integrated model designed in this research (ABC-SMA) as a basic database for pricing medical services and measuring performance.
- 2- Exploiting the support gap in government budget engineering: It is recommended that financial reports based on the ABC system (especially those related to the S5 dental industry service , in which the university bears a severe social burden of 47,397 dinars per case) be submitted to the Ministry of Higher Education and Scientific Research and the funding bodies, to be used as a scientific document to demand an increase in financial allocations and support for the university's operational budget.
- 3- Developing a digital time- tracking system: The study recommends introducing automation technologies to record the actual times that supervising physicians spend treating cases, given that time is the primary driver of cost (at a rate of 412 dinars/minute), thus ensuring the continuity of accuracy and updating of load rates for medical supervision activity.
- 4- Rationalizing and directing absorptive capacities based on strategic burden: It is recommended to reconsider the absorptive capacity of clinics, so that services with economies of scale and low social burden, such as radiology and dental cleaning, are expanded, and their nominal returns are used partly to cover and support the depletion of resources resulting from complex dental industry services, in order to create a kind of self-financing financial balance.

- 5- Generalizing the integrated philosophy to the rest of the academic units: The study recommends generalizing this proposed model to other colleges and service centers within the University of Dhi Qar (such as legal consulting clinics, medical analysis centers, and engineering consulting offices) to ensure that the developmental impact and comprehensive social responsibility of the university are demonstrated and documented before the community, the local government in the governorate, and the central government in an accurate digital manner.

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