

Article

The Feasibility of using Automated Teller Machines (ATM) and (POS) Machines in the City of Najaf

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Abstract: This study aimed to provide an insight into electronic payment projects and their economic viability in the Iraqi environment. The feasibility results indicated a payback period of approximately five years. The project's short-term debt repayment capability stood at around 62%, which is satisfactory. Regarding project liquidity, it was at 27%, and its ability to utilize available resources was around 181%, exceeding expectations. Project management demonstrated high efficiency in capital utilization, estimated at 4.29 times the required amount. The revenue coverage ratio for operating costs yielded a good result of approximately 107%. The project's profitability in relation to total investments reached around 22%. The key findings highlight a genuine desire among banks and electronic money specialized companies to offer innovative and comprehensive services, aiding in attracting new customers and expanding the reach of electronic cash handling devices such as ATMs and POS terminals. However, according to market research, the proliferation of such devices does not align with population growth and the increasing demand for electronic services.

Keywords: financial feasibility, ATM, POS, E-Commerce

1. Introduction

Following the widespread proliferation of the internet worldwide, the concept of e-commerce has evolved, encompassing all its elements from electronic banks to e-commerce laws, digital currencies, markets, goods, and services [1]. Perhaps the most crucial element in this commerce is the means of fulfilling obligations and exchange, with logistical support pillars, infrastructure, and companies facilitating its spread and economic viability to maintain the continuity and constant development of electronic cash transactions [2]. Undoubtedly, the use of ATMs brings numerous benefits and advantages on both individual and commercial levels, such as saving time and effort by allowing quick and easy cash withdrawals without the need to visit banks or currency exchange offices, providing convenience by accessing cash anytime, day or night, without waiting in queues or adhering to bank hours, ensuring security and privacy, offering currency diversity especially during travel times, and importantly, reducing costs for banks and financial institutions, thus stimulating economic growth [3], [4], [5], [6]. In general, the use of ATMs brings numerous economic and social benefits, making it a preferred choice for individuals and businesses alike.

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2. Materials and Methods

2.1. Importance of research

The significance of research is underscored by the economic activity, particularly in the diverse city of Najaf with its varied activities, and the importance of digital transformation across all aspects of life, notably in financial and economic realms, and the entry into the knowledge economy. The magnitude of daily financial and commercial transactions for Iraq as a whole and, specifically, for the esteemed city of Najaf, with an official population of two million and approximately two and a half million including migrants, visitors, and workers from outside the city, makes it imperative to assess the economic feasibility of the digital financial transformation project. Its economic viability necessitates the establishment of a policy for continuous qualitative and quantitative improvement and development.

2.2. Research objective

The research aims to highlight the role of information technology in supporting the financial sector and the attainable outcomes. Furthermore, it aims to measure the feasibility of a project to increase grants for electronic cash transactions, monitor current grants, encourage them, and urge the development of a strategic deployment plan within the geographic scope. It also aims to provide greater facilitation, higher reliability guarantees, and reduced error rates, focusing on achieving quality in financial services provided to customers and after-sales service. One of the most important objectives is to accommodate the increasing demand for electronic payment services and promote acceptance of payment methods within society.

The Issue of Study Do the companies and banks that provide access to Automated Teller Machines (ATMs) and Point of Sale (POS) devices in Najaf city achieve economic feasibility? Assumptions Banks and card issuers achieve economic feasibility with electronic cash transactions, but their proliferation is not at the desired level. Theoretical Framework Electronic payment methods and related devices are diverse and can be categorized into the following devices and methods: electronic payment via Point of Sale (POS) devices, which stands for Point of Sale, and payment through Automated Teller Machines (ATMs), which stands for Automated Teller Machine. Payment can also be made through mobile applications and financial transfers through applications belonging to government and commercial banks (Bank Applications) or social media applications such as the widely used WeChat app in China. What is provided is a set of interconnected devices and software that work together to enable invoicing for buying and selling. These usually contain buttons or shortcuts for quick access to enable operations to be carried out quickly, serving as the main component of commercial activities through which payment is made for purchasing any product or service from all commercial stores via electronic cards in their various forms. They are also available in government departments, malls, shops, restaurants, pharmacies, gas stations, etc. Among its features are:

- 1) **Speed and Efficiency:** The utilization of electronic payment devices enhances the speed of transactions and reduces waiting times in queues, allowing customers to conduct transactions quickly and easily using their cards.
- 2) **Customer Experience Improvement:** Customers can opt for cashless payments, providing them with added convenience and making the shopping experience smoother and more convenient.

- 3) **Time and Effort Saving:** Electronic payment devices can automate processes like ticket printing and sales report generation, saving the time and effort required for manual operations.
- 4) **Transaction Security:** Electronic payment devices are considered safe and reliable, with financial information and transactions encrypted to ensure data confidentiality and protect customers from fraud and unauthorized use.
- 5) **Financial Operations Management:** When paying through electronic payment devices, customers can track financial transactions, such as the amount paid, payment location, and remaining balance, through SMS messages provided by banks and payment companies. Furthermore, accurate and detailed invoices are generated, minimizing potential errors.

2.3. Electronic card technology

- 1) **Credit Cards:** Issued by banks and specialized companies, credit cards allow customers to conduct financial transactions (cash withdrawals, bill payments, online shopping) within and outside Iraq, with the option to settle the amount later, incurring interest charges if not paid within the specified period.
- 2) **Debit Cards:** Linked to customers' bank accounts, debit cards enable them to perform financial transactions (cash withdrawals from ATMs, purchases at POS terminals, online shopping), with the amount deducted instantly and in real-time from the account.
- 3) **Prepaid Cards:** Issued by banks, companies, and payment service providers, prepaid cards come with an initial balance (usually zero) upon receipt, requiring a specified amount to be deposited into the card account. These cards come in various types, some for one-time use for online shopping purposes only, while others are reloadable and can be used for ATM withdrawals, POS transactions, and online shopping both domestically and internationally.

2.4. Electronic wallets

One of the electronic payment methods via mobile phones registered with the licensed service provider by the Central Bank based on the principles of Know Your Customer and the customer's personal phone number to enable customers to carry out financial transactions. Its main features include:

- Direct transfer of amounts from one wallet to another
- Payment for purchases
- Cash withdrawals
- Payment of various bills
- Topping up mobile phone credits
- Purchasing entertainment service cards from games and applications.

2.5. Banking services via mobile applications

Allowed banking services include electronic money transfer between banks via mobile phones, requesting bank transaction statements, transferring funds between customer accounts, accessing details of services, loans, products, prices, and banking offers, inquiring about ATM locations and bank branches, and communicating with customer service efficiently.

2.6. Objectives and services of ATMs and POS terminals

2.6.1. Objectives

Several objectives exist, including:

- Reducing bank operating costs
- Increasing the bank's customer base and deposits
- Directing customers to more efficient service channels
- Shortening queues and reducing customer service time
- Providing services 24/7.

2.6.2. Services provided

ATM technology offers numerous services, including balance inquiries, cash withdrawals, account-to-account transfers, cash and check deposits, bill payments.

2.7. Requirements for cash dispensing machines

Various requirements exist, including:

- Reliable infrastructure for power and communication networks
- Post-sales service provided by the supplier or a third party
- Established resources and procedures for card distribution and personal identification number monitoring
- Provision of valid currency denominations
- Secure cash transfer completion systems to ATMs
- Economical rates for telephone or leased lines dedicated to sending and receiving data to and from ATMs
- Centralized database storing customer data for balance verification.

2.8. Benefits of Automated Cash Handling Systems

- Flexible access allows customers to access their accounts as they see fit
- Elimination of the need for personnel from smaller financial institutions to conduct transactions, providing them with more room for customer service
- Aligning with customers' increasingly diverse operating hours
- Providing more money at a lower cost, as the machines operate efficiently
- ATMs facilitate savings innovation for customers.

2.9. Costs of Automated Cash Handling Systems

- Costs vary depending on the provider of the technology and how the ATM or POS network is operated
- Equipment and device ownership costs upfront or network subscription fees
- Setup fees for installing ATMs and POS terminals and connecting them to the internet
- Usage fees, whether on a per-transaction basis or monthly basis
- Annual or monthly service fees for support, telecommunications costs for telephone or leased lines, or wireless data connections.

2.10. Advantages of using Automated Cash Handling Systems

- 1) Reliability

Refers to the ability of automated cash handling devices to operate continuously, providing consistent and error-free services. It entails efficiently performing required services reliably and accurately at all times, making reliability crucial as it encompasses effective performance of required services reliably and accurately.

2) Convenience

Refers to the location of ATMs or POS terminals, allowing customers access 24/7. Customers can easily use ATMs near their residences, stores, or other places they frequent, such as malls and airports. Compatibility of the customer's ATM card with other bank ATMs is also included.

3) Ease of use

Indicates how trouble-free automated cash handling devices provide a hassle-free experience for customers. If customers perceive electronic banking services as user-friendly and hassle-free, they are more likely to use the system. User-friendliness involves providing customers with easily understandable language to interact with, along with clear instructions on usage.

4) Security and Privacy

Security refers to protecting customers from deception and financial loss, while privacy involves safeguarding their personal information. Privacy includes a set of legal requirements and best practices concerning personal data processing.

5) Customer Service and Support

Refers to services provided to customers to meet their needs and promptly address their complaints. Although automated cash handling devices enable customers to perform numerous banking transactions, customer service personnel are still necessary from applying for an ATM card to resolving issues.

6) Efficiency

Indicates how well automated cash handling devices deliver results that meet customer expectations. It includes the devices' ability to provide transaction receipts, dispense cash as needed, fulfill obligations, and purchase goods and services.

3. Results and Discussion

3.1. Analytical and Quantitative Framework

3.1.1. Economic Feasibility of the Project

Economic feasibility study is a scientific method aimed at estimating the success prospects of an investment idea before its implementation. It involves assessing the feasibility of using Automated Teller Machines (ATMs) and Point of Sale (POS) devices, starting from estimating the investment and operational costs, as well as revenues, income disclosure, and cash flows. Finally, financial ratios are derived for the project, and a decision is made to accept or reject the project based on the analysis of these financial ratios.

3.1.2. Market Vision

In the holy city of Najaf, there are three main government banks, each with around 20 branches, except for the Iraqi Trade Bank, which has two branches. The number of private banks in the city exceeds 15. There are three companies exporting electronic cards and cash transactions. All mentioned government and private banks, as well as companies, operate around 30 ATMs each, with a minimum daily transaction volume of \$4,000. The number of POS devices in the city is approximately 500 and can be increased. The city,

according to initial surveys, requires more devices overall and wider coverage to encompass all parts of the city.

Table 1. Summary of economic feasibility study

Fixed capital		1,108,750
Working capital		467,503
Investment costs		1,576,253
Fixed costs		397,533
Variable costs		1,472,480
Operating costs		1,870,013
Sales		2,007,000
Net profit		259,925
Opportunity cost	0.04	63,050
Depreciation		121,100
Financial indicators		
Internal rate of return	Positive	0.12
Return on investment	%	0.22
Payback period	Year	4.59
Operating cost coverage ratio	Time	1.07
Interest coverage ratio	Time	251
Profitability index	More than 1	1.24
Break-even point	%	74.4
Liquidity ratio	More than 1	0.27
Turnover ratio	More than 1	0.62
Inventory turnover rate	More than 1	1.81
Working capital turnover rate	More than 1	4.29

Table 2. Estimation of fixed capital

	Total amount	Amount	Quantity	Establishment expenses
19,250	Amount	Price	Quantity	Furniture and office equipment
34,000	Amount	Book value	Quantity	Machinery and basic equipment
	540,000	18,000	30	ATM machines
	160,000	80	2,000	POS machines
	75,000	75,000	1	Servers
	50,000	50,000	1	Software
	30,000	30,000	1	Support equipment
855,000	Amount	Price	Quantity	Secondary equipment and supplies
21,500				
1,108,750	Total fixed capital			

Table 3. Estimation of working capital for an operating cycle

Total amount	Expected annual amount	Cycle duration / month	Annual fixed costs
3,553	14,213	3	Management services, fuel, and spare parts
34,343	137,370	3	Administrative expenses
8,000	32,000	3	Marketing expenses
2,000	8,000	3	Benefits and fees
30,275	121,100	3	Depreciation
963	3,850	3	Extinguishing establishment expenses
20,250	81,000	3	Salaries and wages for administrators
99,383			
Total amount	Expected amount	Cycle duration / month	Variable annual costs
258,750	1,035,000	3	Cost matrix
3,450	13,800	3	Services, fuel, and production spare parts
14,120	56,480	3	General production expenses
91,800	367,200	3	Salaries and wages / production
368,120			
467,503	Total working capital		
1,576,253	Total investment costs		

Table 4. Project revenue estimate

Services and goods	Annual quantity	Monthly quantity	Selling price	Unit of measurement	Total amount
ATM services	43,200,000	3,600,000	0.020	Operation	864,000
POS services	360,000,000	30,000,000	0.003	Operation	1,080,000
Card services	9,000	750	7.000	Card	63,000
					2,007,000
2,008,837	Total annual revenue		Source: Prepared by the researcher		

The table (5-6) illustrate the income statement and cash flows, showing the project's net profit for the next five years, considering an annual sales growth rate of 5%, based on market research and market share estimation. Moreover, the cash flow statement, among the key financial statements, aids users in understanding the institution's financial position. The importance of cash flows lies in their ability to reveal the cash impact of all activities

undertaken by the company during the financial period, elucidating the nature of this impact as either inward or outward cash flows for the project.

Table 5. Preparation of project income statement

	Year One	Year Two	Year Three	Year Four	Year Five
Growth rate %	1.00	1.05	1.10	1.15	1.20
Sales	2,007,000	2,107,350	2,207,700	2,308,050	2,408,400
Sales returns	0	0	0	0	0
Net sales	2,007,000	2,107,350	2,207,700	2,308,050	2,408,400
Cost of goods sold	1,472,480	1,546,104	1,619,728	1,693,352	1,766,976
Total operating income	534,520	561,246	587,972	614,698	641,424
Operating expenses	276,433	276,433	276,433	276,433	276,433
Net operating income	258,088	284,814	311,540	338,266	364,992
All other revenues	1,837	1,929	2,021	2,113	2,204
Net income before tax	259,925	286,742	313,560	340,378	367,196
Tax	0.00	0	0	0	0
Net income after tax	259,925	313,560		340,378	

Table 6. Preparation of the project cash flow statement

Sales	2,308,050	2,207,700	2,107,350	2,007,000	2,408,400
Cost of goods sold	1,693,352	1,619,728	1,546,104	1,472,480	1,766,976
Total operating income	614,698	587,972	561,246	534,520	641,424
Disbursements	121,100	121,100	121,100	121,100	121,100
Profit before interest and taxes	493,598	466,872	440,146	413,420	520,324
Interests	8,000	8,000	8,000	8,000	8,000
Profit subject to tax	485,598	458,872	432,146	405,420	512,324
Tax	0	0	0	0	0
Profit after tax	485,598	458,872	432,146	405,420	512,324
Net cash flow	614,698	587,972	561,246	534,520	641,424

Table 7. Sensitivity analysis of the project

Change	Operating costs	Revenues	Increase	Decrease	
-62,059	1,870,013	1,807,953		0.9	First scenario
-48,177	2,057,014	2,008,837	1.1		Second scenario
138,825	1,870,013	2,008,837			Current revenues and costs
<p>The project is sensitive to changes in revenues with fixed operating costs</p>					Source: Prepared by the researcher
<p>The project is sensitive to changes in operating costs with fixed revenues</p>					

Table 8. Project risk analysis

	Project risk assessment					Risky Project
	Very negative	Negative	No impact	Positive	Very positive	Impact direction
	1	2	3	4	5	
Project sensitivity level					1	Very positive
Increase in loan value					1	Very positive
Increase in loan interest					1	Very positive
Market fluctuations				1		Positive
High competition				1		Positive
Inflation		1				Negative
Political situation		1				Negative
Decrease in demand				1		Positive
Low liquidity				1		Positive
Analysis results	0	-4	0	16	15	5.4
Project risk	Acceptable					

Table 9. Sector development analysis of the project

	Sector to which the project belongs					Sector Development
	Very negative	Negative	No impact	Positive	Very positive	Impact direction
	1	2	3	4	5	
Increase in sector infrastructure					1	Very positive
Innovation of new methods				1		Positive
Qualification of specialized personnel				1		Positive
Achieving growth in the sector				1		Positive
Achieving quality in outputs				1		Positive
Transfer of modern technologies					1	Very positive

Increase in job opportunities				1		Very positive
Increase in state share				1		Positive
Improvement of balance of payments	1			1		Negative
Achieving stability in the sector				1		Positive
Low liquidity	0	-2	0	28	15	8.2
Development of the project sector						Acceptable

Table 10. Financial ratios and criteria for the project

	Calculated	
%	0.22	Return on investment Measures the profitability of the project to total investments
Year	4.59	Payback period Number of years required to cover the amount in the project when the net annual cash flow is constant
Time	1.07	Operating cost coverage ratio Using revenues to cover operating costs
Time	251	Interest coverage ratio Using project revenues to cover interest costs
More than 1	1.24	Profitability Index (PI) A relative index of project profitability
More than 1	0.27	Liquidity ratio Measuring the quick ability to meet obligations
More than 1	0.62	Turnover ratio Amount of asset coverage for liabilities
More than 1	1.81	Inventory turnover rate Project's ability to utilize available resources
More than 1	4.29	Working capital turnover rate Efficiency of management in using working capital

The examination reveals that the project's payback period spans approximately five years. Its capability to fulfill short-term obligations hovers around 62%, a figure deemed acceptable. Regarding liquidity, the project boasts a quotient of 27%, demonstrating an ability to manage exigent financial commitments. The project's capacity to leverage available resources stands at approximately 181%, surpassing requisite standards. Noteworthy is the management's adeptness in deploying working capital, calculated at 4.29 times the stipulated threshold. Moreover, the project exhibits a commendable revenue utilization

rate, covering operational costs by an estimated 107%, indicative of prudential fiscal management. The project's profitability vis-à-vis total investments approximates 22%, signaling a robust financial stance.

4. Conclusion and Recommendation

4.1. Conclusion

- 1) Given the economic activity in Iraq and in the city of Najaf Al-Ashraf, and its diverse economy (religious tourism, medical tourism, commerce, industry, agriculture), we have sensed a vital need for electronic financial services, akin to the rest of the world, owing to the inevitable necessity prompted by the global advancement in e-commerce.
- 2) There is a genuine desire among banks and companies specializing in electronic money to offer innovative and comprehensive services, aiding in acquiring new customers and wider deployment of electronic cash transaction devices (ATMs and POS). However, according to market research, the proliferation of such devices does not correspond to population growth and the increasing demand for electronic services.
- 3) Customer interaction with banks and stores equipped with ATMs and POS devices makes the customer feel comfortable and reassured.
- 4) Upon reviewing the study, where all results were favorable, the project's pay-back period was approximately five years. The project's short-term debt service coverage ratio was about 62%, meeting requirements. The project's liquidity stood at 27%, while the ability to utilize available resources was around 181%, both exceeding expectations. Project management demonstrated high efficiency in using working capital, estimated at 4.29 times the required amount. The revenue usage standard to cover operating costs yielded a satisfactory result of nearly 107%. The project's profitability relative to total investments was approximately 22%.

4.2. Recommendation

- 1) After reviewing the results obtained from the market study, cash flows, income disclosures, and financial ratios, the study recommends the feasibility of investment opportunities in Automated Teller Machines (ATMs) and Point of Sale (POS) devices in the city of Najaf. Expanding the geographical coverage and increasing the deployment of devices achieves a real high return.
- 2) Increased usage of electronic payment services contributes to customer satisfaction and increases reliance on electronic services, which benefits the national economy in several ways, such as reducing the government's need for large cash reserves, especially during salary payment times for public sector employees. Electronic payment reduces pressure on banks and facilitates payment of dues and obligations for all parties.
- 3) The market is expanding to provide more opportunities and licenses for issuing electronic cards and committing to providing ATMs and POS devices. This encourages competition, which positively impacts service quality, reliability, especially electronic clearing, and minimizes error rates as much as possible.

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