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### Digital Transformation Framework for Automated Preparation Project of Program and Performance Budgeting as a Service to Localities in Egypt

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#### Abstract

Within the framework of achieving the government's work program and Egypt's Vision 2030, the state seeks digital transformation "DT" in all fields. Therefore, DT Framework for automated preparation project of Program and Performance Budgeting as a service "APPPPBS" to Localities in Egypt, especially after the issuance of the Unified Public Finance Law, which seeks to fully implement the Program and Performance Budgeting "PPB" By 2026 to achieve optimal use of state resources efficiently and effectively.

This study is based on defining a new framework for the business model based on the idea of innovation for the current situation to PPB through DT technology, such as Analytics, automation, cloud computing, and the Internet of Things, relying on the analysis of previous studies, questionnaires.

The results of the study presented unified concepts for PPB, strategies and objectives of localities work programs in accordance with government programs and the presidential Resolution on the Establishment of the Ministry of Local Development and Governorates, arriving at performance levels for activities at the level of local units, Methodologies for calculating the direct costs of some production elements and Architecture of APPPPBS.

**Keywords:** Digital Transformation Technologies, digital transformation framework, Digital Transformation Business, Cloud Computing, IOT, Program and Performance Budgeting, Performance Based Budgeting.

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### اطار للتحول الرقمي لأتمتتة إعداد مشروع موازنة البرامج والأداء كخدمة للمحليات في مصر

#### مستخلص

فى إطار تحقيق أهداف برنامج عمل الحكومة المصرية ورؤية مصر 2030 تسعى الدولة الى التحول الرقمى فى كافة المجالات ولذلك جاء هذا الإطار (إطار للتحول الرقمى لأتمتة خدمة مشروع اعداد موازنة البرامج والاداء) خصوصا بعد اصدار قانون المالية العام الموحد رقم 6 لسنة 2022 والذى يسعى الى التطبيق الفعلى الكامل لموازنة البرامج والاداء بحلول عام 2026 عوضا عن موازنة الابواب والبنود لتحقيق الاستخدام الامثل لموارد الدولة بكفاءة وفاعلية.

تعتمد هذه الدراسة على التحول الرقمى من خلال ابتكار اطار عمل خدمى لاتمتة مشروع اعداد موازنة البرامج والاداء من خلال تكنولوجيا التحول الرقمى مثل تحليل البيانات، اتمتة نظام العمل، خدمات الحوسبة السحابية وانترنت الاشياء معتمدا فى ذلك على تحليل الدراسات السابقة وعمل الاستبيانات.

توصلت الدراسة إلى استنتاج مفاهيم موحدة لموازنة البرامج والاداء، واستخلاص برامج عمل المحليات وفقا لإستر اتيجيات وأهداف برنامج عمل الحكومة وقرارات إنشاء وزارة التنمية المحلية والمحافظات، وصولا لمستويات الاداء للأنشطة على مستوى الوحدات المحلية، و ومنهجيات احتساب التكاليف المباشرة لبعض عناصر الانتاج وكذلك هيكل أتمتة خدمة مشروع إعداد موازنة البرامج والاداء .

#### الكلمات المفتاحية:

تكنولوجيا التحول الرقمى، اطار التحول الرقمى، أعمال التحول الرقمى، الحوسبة السحابية، انترنت الاشياء، موازنة البرامج والاداء، الموازنة القائمة على الاداء.

### Introduction

Egypt's Vision 2030 is moving towards PPB instead of line budgeting [1], therefore it issued a unified general finance law [2] in order to enhance public expenditure efficiency and effectiveness and links funding with programs results [3].

# 2. Research Problem:

Egypt is implementing programs and performance budgeting, but analysing the current situation reveals numerous problems in the application, as follows:

- Despite extensive training by the Ministry of Finance, there is a lack of clarity regarding budgeting programs and worker performance in localities.
- The current investment plan for programs and performance in Chapter Six is being adopted, disregarding local basic programs in accordance with the Resolution on the Establishment.
- The Ministry of Local Development has prepared a result using Excel, overcoming challenges in compiling PPB forms for each governorate.
- The lack of a centralized database to collect financial data impedes its analysis.
- Excel forms are disseminated at the governorate level rather than at lower levels in localities such as districts and units.
- The cost calculation for each program is difficult.

# 3. Research Questions:

- Can we define unified concepts when preparing the program and performance budgeting (PPPPB) project?
- How do we analyze the goals that government units wish to implement and distribute those goals to programs and projects?
- Is this framework able to calculate the cost of each program?
- Can we innovate the DT form for APPPPBS?

### 4. Research Importance:

This study helps localities move towards to DT as part of the state's Vision 2030 through putting a framework for DT to PPB at level of MLD and 27 governorates affiliated with it. Thus, it is required for the following reasons:

- Prevention of administrative and financial corruption and promotion of transparency at all community levels.
- Enhance the efficiency of creating future plans for localities and ensuring disciplined financial allocations in line with the proposed programs.
- The framework facilitates efficient data retention and retrieval.
- Findings and indicators can be easily retrieved and compared to estimated objectives.
- The framework is designed to enable researchers to conduct data mining and discover new data patterns.
- Minimize paper consumption to reduce costs.
- Reduce the cost of obtaining software licenses.
- The proposed solution attempts to save money and time by reducing movement of the employees from each governorate to MLD locating for PPPPB delivery.
- APPPPBS is capable of identifying the organization's core, subprograms, and associated activities for each project.

# 5. Research Objectives:

The main objectives of the Proposed framework:

- Innovate a framework for (APPPPBS) to overcome problems that occur when dealing with Excel files such as (link errors, equations and aggregation, human errors) and obtain structural data that enables us to extract the outcome, results and create different levels of reports, indicators.
- ability to obtain Conceptualize goals, main and sub-programs, projects and activities according to the results, which the localities must work on in accordance with the decision to establish those local

units, with the possibility of determining the direct costs of those programs such as cost of (electricity, labor, vehicles, etc.).

### 6. Research Methodology

This study is a combination of descriptive analytical, qualitative, and quantitative methods. It's a descriptive analytical research methodology which has been found through studies and applied different research, and depends on important previous studies that formed a vital source in the study. It's Qualitative research because it has some questions such as: Can we define unified concepts when PPPPB? How do we analyze the goals that government units wish to implement and distribute those goals to programs and projects? Also, this research is quantitative because we can obtain a framework based on different tools and technologies, using hardware and software.

### 7. Research hypotheses:

The research was based on the possibility of establishing APPPPBS to Localities in Egypt considering the following assumptions:

- Define unified concepts when PPPPB.
- Analysis of the goals that government units wish to implement and distribute to programs and projects.
- Obtain framework to PPPPB.
- Ability to extract multiple levels of reports and indicators.
- 8. Research limitations:
- **Spatial limitation:** The scope of the proposed thesis is limited to local planning and budget departments.
- Time limit: From 2021/2022 to 2023/2024.

# 9. Sources of data collection:

Data will be collected from the following sources:

- 9.1 Literature Review.
- 9.2 Questionnaires.

### 9.1 Literature Review:

systematic review of the literature was conducted to assess an APPPPBS. this research focused on seven concepts which help for answering the research questions, these concepts are 1-digital transformation & cloud computing, (2)digital transformation & automation, (3)digital transformation & public sector, (4)digital transformation & IOT, (5) digital transformation & performance-based budgeting, (6)digital transformation & program and performance budget and (7) digital transformation. the search was conducted through the Egyptian knowledge bank, literature resulted in an initial retrieval of 17313 relevant titles and abstracts of peer reviewed publications. the researcher chooses IEEE, springer, and science direct as the top three international magazines to search for relevant papers and chose the English language as one of the search criteria. in addition, specific years were selected to search for relevant studies as 2023, 2022, 2021, 2020 and 2019. all retrieved papers were assessed based on titles and abstracts to determine which research should be kept for further analysis based on full text evaluation, in light of the previous methodology, we can conclude that the research results indicate that there are no clear studies linking digital transformation technology with program budgeting and performance. therefore, this study is one of the important studies that links digital transformation technology with program budgeting and performance. the following table summarizes the results reached by the researcher

International Magazines	Year	Digital transformation	Digital Transformation & Cloud computing	Digital Transformation & Automation	Digital Transformation & Public Sector	Digital Transformation & IOT	Digital Transformation& performance-Based- Budgeting	Digital Transformation & Program and Performance Budget	Total			
	2019	251	17	25	2	14	0	0	309			
	2020	334	27	31	6	23	0	0	421			
E	2021	321	23	52	5	16	0	0	417			
Ē	2022	402	26	56	6	28	0	0	518			
	2023	478	38	49	7	32	0	0	604			
	Total	1786	131	213	26	113	0	0	2269			
	2019	166	8	10	3	1	0	0	188			
	2020	201	5	12	5	7	0	0	230			
ds	2021	295	25	21	20	7	0	0	368			
- Tin	2022	367	47	36	20	17	0	0	487			
gei	2023	489	70	64	58	31	0	0	712			
	Total	1518	155	143	106	63	0	0	1985			
S	2019	784	141	143	141	10	6	5	1230			
cie	2020	1084	212	195	218	15	4	4	1732			
псе	2021	1580	287	337	366	11	13	9	2603			
d	2022	1995	425	445	486	14	8	7	3380			
ree	2023	2396	523	592	569	18	11	8	4117			
t	Total	Total 7839 1587 1712 1778 68 42 3										
	Total											

Table 1: Total of studies related of each concept

**9.1.1 DT:** The following section represents an example of the most relevant studies to DT.

Erico' Marcon and Marie-Anne Le Dain's 2022 review explores the integration of big data and cloud computing in Industry 4.0 business models. They discuss the integration of digital technologies like IoT,

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cloud computing, big data, and artificial intelligence with front-end technologies like additive manufacturing and sensors, enhancing the efficiency and effectiveness of smart factories [4].

Malak Baslyman's 2022 study delves into digital transformation (DT) through conceptual models and interviews with senior leaders. It emphasizes the importance of data and technologies in DT, but fails to connect it to the PPB framework, which focuses on organizational transformation [5].

Tobias Riasanow, Markus Böhm, and Helmut Krcmar have significantly contributed to the understanding of digital technologies in organizations. They emphasize the importance of digital transformation strategies in managing the transition from product-centric to servicecentric business models. Their research integrates digital service innovation and DT, providing a perspective on DSI failure and highlighting interdependencies between factors [6].

### **9.1.2 Digital Transformation and Cloud Computing:**

The follwoing section includes the most relevant studies on DT and CC.

Georgios Lambropoulos, Christos Douligeris, and Sarandis Mitropoulos are collaborating on a paper discussing cloud computing services, security risk awareness, and the transition from traditional computing to cloud-oriented ones. The paper emphasizes the importance of adopting cloud-oriented technologies for effective digital transformation strategies [7].

Chunxia Jiang, Maoyong Cheng, and Chenchen Zhao conducted a study on the impact of Chinese banks' strategic adoption of cloud computing on performance and risk-taking. The findings revealed that cloud computing led to lower cost efficiency, higher profit efficiency, and greater operational risk in Chinese banks from 2008 to 2019, enhancing cost efficiency and operational risk control [8].

Khalid Alzadjali and Amany Elbanna's study highlights the positive impact of organizations on cloud computing motivation, highlighting the significant role of institutional forces in adopting digital infrastructure, whether positive or negative, in the process of infrastructure as a service (IaaS) [9].

### 9.1.3 DT in Government and Public Sector:

Myungjung Kwon and Sounman Hong's study on digital innovation in the public sector identifies four theoretical mechanisms: demand-pull innovation, the electoral incentive hypothesis, isomorphic pressure, and higher echelons theory. They found that local governments respond to community requests for innovation, electoral incentives influence motivation, and younger policymakers are more active innovators. The study also confirms isomorphic pressure and political incentives' impact on local government motivation [10].

Cristina Lopes and Conceição Castro emphasize the importance of sustainable development in modern communities. They argue that effective governance is crucial for managing resources, particularly natural resources, for present and future generations. E-government, which integrates policies and public services, promotes long-term economic growth, social development, and environmental protection. A study using a logit model reveals that e-government positively predicts a country's achievement of sustainable development, especially in developing and transition economies. Countries with lower age dependency and natural resource rents are more likely to experience sustainable development [11].

John Effahb and P.K. Senyoa's study on digital platformization in the public sector highlights the growing trend in developing economies. Despite challenges like the digital divide and institutional voids, digital platformization is accelerating technological advancement. The study, based on Ghana's paperless port, creates a transformative affordance framework (TAF) to describe how digital platforms support public sector transformation, demonstrating four transformational effects [12].

Hamish Simmonds, Aaron Gazley, Valtteri Kaartemo, Michelle Renton, and Val Hooper's study on service ecosystem emergence in the public sector digital transformation provides new theoretical insights. The study identifies three fundamental mechanisms: compression,

ecotonal coupling, and refraction, which contribute to emergent relationality and multi-leveled complexity. This research advances our understanding and empirical relevance of service ecosystem formation in the literature [13].

# 9.1.4 Digital Transformation and Business

Matthias Fabian Gregersen Trischler and Jason Li Ying conducted DBMI research to address conceptual misunderstandings among experts. They conducted a literature review of 57 publications, tracing the origins of essential aspects of the DBMI idea and offering a new definition. The goal is to contribute to constructing clarity in DBMI research by exposing the topic to a larger audience and improving understanding of digital business model innovation [14].

Christina Kuehnl and Christian Homburg conducted a study on the impact of digital business capacity (DBC) on company and customer performance. The research revealed that DBC improves performance beyond recognized factors, reaching a crucial degree of internal dynamism (U-shaped moderation). However, it is most effective at an optimal level of external dynamism (inverse U-shaped moderation). DBC is more valuable for consumer-facing businesses than businessto-business ones. [15].

Arvind Malhotra and Stefano Bresciani's research on digital transformation highlights its impact on product, process, and business model innovation. The study explores the development of new digital skills, business models, and consumer roles. It emphasizes the importance of understanding the effects of digital transformation on key business model components like value creation, configuration, and capture. The research also explores how firms can develop dynamic capacities to embrace digital innovation in specific contexts like smart cities and growth strategies like internationalization, diversification, and vertical or horizontal integration. [16].

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### 9.1.5 DT & Programs and Performance Budget

Alexandru Stratan, Tatiana Manole. Proposed study about Program and Performance Based Budgeting. Actuality of the research resides in the application for the first time in the Republic of Moldova of the program and performance-based budgeting (PPBB) at the local level. The aim of the article is to evaluate PPBB and its influence on the responsibility of the local authorities and improving the use of public money. The research methodology is based on the calculations of the correlation reports between different local budget indicators. The results present that the level of financial autonomy depends on the financial possibilities of the administrative-territorial entities. Thus, there is required to supplement the revenues by detecting domestic reserves and their use by the local administration [17].

Alaa Mohamad, Magdy Melegy. adopted a number of approaches and techniques in public sector organizations to improve the budget system, such as Program and Performance Budgeting System (PPBS), Performance Based Budgeting System (PBBS) and Zero-Based Budgeting (ZBB). The study concentrates its focus on the support which it may find in case of "budgetary format" is adopted by the "Public Sector Organizations" in the kingdom of Saudi Arabia. The study explores several dimensions such as familiarity, acceptability and adoptability of PPBS, "degree of contribution of Accounting System followed by "public sector organizations" to adopt PPBS", the benefits that might be realized and the obstacles that probably might be faced if this approach of budgeting is adopted by Public Sector Organizations" in Al-Kharj region. The study came up with the following main findings; there is a fair familiarity and understanding of PPBS by financial managers and accountants working in the "public sector organizations", the accounting system followed by "public sector organizations" contributes to adopt PPBS successfully, there are certain benefits could be obtained while adopting PPBS by public sector organizations, and finally certain obstacles have been discovered which

are standing as stumbling-stone to adopt PPBS in "public sector organizations" in Al-Kharj region effectively[3]

### 9.1.6 DT & IOT:

Aleksey Kychkin, Alexander Deryabin, Elvira Neganova, Vladlena Markvirer, spoke about how IoT based energy management systems (EMS) are constantly increasing, how does the IoT provides opportunities to control interconnected smart devices, so improved EMS are being created to support the digital transformation of enterprises. This paper thus provides a system architecture for an energy management assistant, which can be used in enterprises, and thus this study helps us in the current study in linking IOT with DT and implementation in enterprises enabling optimization of energy consumption, analysis of energy data, and speed of decision-making regarding energy management [18].

Abbas M. Al-Ghaili, Hairoladenan Kasim, Naif Mohammed Al-Hada proposes a DT algorithm (DTA) for energy internet-of-things (EIOT) contents to convert original contents to another digital form and to transfer that form utilizing IOT. It is aimed to make sure the transferring process is done safely and efficiently when transfer EIOT contents to destination. The proposed DTA has helped solve the successful transferring rate with a very low loss-in-bits compared to other traditional algorithms, but not spoke about the cost or shared resources such as electricity particularly relevant in workspaces [19]. Mohamed Ramadan Youssef, Mohamed Abdelsalam Ahmed, Samir Abul-fotooh Saleh

### 9.2 Questionnaires.

A questionnaire was required to answer the study questions and demonstrate the validity of the hypotheses.

### 9.2.1 Sample size calculator:

Steven K. Thompson's equation and formula were used to calculate the sample size of 56 personnel from the Ministry of Local Development, including the Director of Budget and Planning representatives from 27 governorates, based on the study's focus on Local Development [20].

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

Where:

n: Sample size (?)

N: Population size N= 56 employees

- Z: confidence level at 95% (1.96)
- d: Error proportion (0.05)
- p: Probability (50%)

According to the Steven Thompson equation, the sample size (n) was 49 questionnaires that were distributed.

Sample Size Ca	lculato	r
Find Out The Sam This calculator computes to constraints.	ple Size	number of necessary samples to meet the desired statistical
Result		
Sample size: 49		
This means 49 or more me real value is within $\pm 5\%$ of	easurements the measure	/surveys are needed to have a confidence level of 95% that the d/surveyed value.
Confidence Level:	95% ~	
Margin of Error:	5 %	
Population Proportion:	50 %	Use 50% if not sure
Population Size:	56	Leave blank if unlimited population size.
Calculate	🕞 Clear	

Figure 1: Calculating the sample size by Steven Thompson equation [21]

# **9.2.2** The questionnaire design:

The closed questionnaire included 14 questions divided into three sections.

- Section one: came to remove the obstacles present in the first question which are related to unifying concepts and definitions to the workers on preparing a project budget for programs and performance.
- Section two: came to remove the obstacles present in the second, which relate to How do we determine the goals that government units wish to implement and distribute those goals to programs and projects.
- Section three: came to reply on of the third and fourth question, which are related to the analysis of the work cycle of PPPPB.

# 9.2.3 Analysis and Interpretation:

The questionnaire form was distributed and 46 questionnaires were approved, with three discarded for incompleteness. The correct questionnaires (46) were analyzed using SPSS. The most frequent answers were extracted using mode and a fifth Likert scale with five degrees, with a weighted mean of 0.80, indicating the accuracy of the responses.

0.000	Grading	Average						
answer	weights	From	То					
Strongly agree	5	4.20	5					
agree	4	3.40	4.19					
neutral	3	2.60	3.39					
disagree	2	1.80	2.59					
Strongly disagree	1	1	.179					

### Table 2: Weighted Mean for Each Answer

### The survey results can be categorized into two sections as follows:

**9.2.3.1** The following table can summarize the results of answering 14 questions for valid questionnaires are 46. Statistical analysis was carried out using the SPSS statistical program to analyze those questionnaires. Table 3: Summary of Survey Results (valid answer)

NO	Phrase	Strongly agree	Agree	Neutral	Disagree	Totally Disagree	Меап	The Trend likely answer		
	Section	One					4.56	Strongly agree		
1	There is difficulty in preparing project of program and performance budget.	33 71.7%	12 26.1%	-	1	-	4.67	Strongly agree		
2	Poor experience of workers is one of the obstacles to applying the program budget and performance	22 47.8%	22 47.8%	2 4.3%	-	-	4.43	Strongly agree		
3	One of the obstacles to preparing project of program and performance budget is the lack of clarity of concepts	29 63.0%	15 32.6%	2 4.3%	-	-	4.59	Strongly agree		
		4.66	Strongly agree							
4	The current administrative structure is not compatible with preparing project of program and performance budget.	32 69.6%	11 23.9%	2 4.3%	1 2.2%	-	4.61	Strongly agree		
5	The current preparing project of program and performance budget sheet still relies on the economic classification.	32 69.6%	10 21.7%	2 4.3%	2 4.3%	-	4.57	Strongly agree		
6	Would you prefer to establish a specialized department for programs and performance budget in the governorate's general office?	35 76.1%	35         11           5.1%         23.9%		-			Strongly agree		
7	The main programs of the localities (so-called Chapter Six) are not sufficient to limit the work of the localities according to Definition and	32	14	-	-	-	70	Strongly		
	goals of the program and performance budget (Revenues & Expenditures program).	69.6%	30.4%	-	-	-	4.	agree		

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ON	Phrase	Strongly agree	Agree	Neutral	Disagree	Totally Disagree	Меап	The Trend likely answer		
	Section Three	2					4.67	Strongly agree		
8	Adding new programs to the five programs, or what is called Chapter Six,	26	18	2	-	-	52	Strongly		
0	reduces indirect costs.	56.5%	39.1%	4.3	-	-	4	agree		
	The difficulty of applying preparing project of program and performance	32	11	2	1	-	1	Strongly		
9	budget is the inability to calculate the costs for each project.	69.6%	23.9%	4.3%	2.2%	-	4.6	agree		
10	The current Excel sheet for preparing project of program and performance budget does not adopt specific methods for	33	10	3	-	-	.65	Strongly		
	calculating all direct and indirect costs, such as (wages, vehicles, administration, lighting, etc.).	71.7%	21.7%	6.5%	-	-	4	agree		
11	In general, after filling out the current Excel sheet for programs and performance, you find that the value of	36	6	3	1	-	.67	Strongly		
	indirect costs is greater than the value of direct costs.	78.3%	13%	6.5%	2.2%	-	4	agree		
12	Reducing indirect costs is considered a success of the program	36	8	2	-	-	.74	Strongly		
	success of the program.	78.3%	17.4%	4.3%	-	-	4	ugree		
13	Applying program and performance budgeting enables direct and indirect costs	34	10	2	-	-	70	Strongly		
	to be calculated.	73.9%	21.7%	4.3%	-	-	4.	agree		
14	What if we moved to digital transformation through an electronic web application service that would enable programs and performance budget to calculating most of the costs in an automatic manner and linking various departments at the same level and	41	2	3	-	-	4.83	Strongly agree		
	the higher administrative levels in the administrative structure of the localities?	89.1%	4.3%	6.5%	-	-				

Continues Table [6.5]: Summary of Survey Results (valid answer)

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# **9.2.3.2** Analysis of the Statistical Results of Part One is separated into three sections.

**The first section** of table 4.6 reveals that the arithmetic mean of answers to three questions is 4.56, indicating difficulty in PPPPB due to unclear concepts and employee experience. This thesis aims to define unified concepts of PPPPB in all governorates, as the results strongly support the presence of difficulties in understanding and implementing PPPPB.

The second section of table 4.6 demonstrates that the questionnaire findings indicate that the PPPPB's organizational structure is incompatible with its use of the economic classification technique for budgeting items. The results show that the organization's aims and programs are insufficient to meet the governorates' objectives and programs. Respondents strongly agreed to establish a specific department for programs and performance budgets in each governorate's general office, with answers ranging from 4.20 to 5, indicating a consistent organizational structure.

**The final section of table 4.6** illustrates that the PPPPB study concluded that determining indirect costs is difficult, with a Likert scale score of 4.67. The Excel sheet used to calculate direct and indirect expenses is not appropriate for this task. The study concludes that electronic web application services are critical to digital transformation. To make these services available as software as a service (SaaS), explore the PPPPB work cycle, which allows for action diagramming of input elements based on output.

# **10. Framework to APPPPBS:**

The framework is divided into four sections, as depicted in the diagram below.



Figure 2: Framework to APPPPBS

**10.1 First Section:** The analytical study conducted on PPPPB aimed to develop a specific, unified definition of these concepts based on the analysis of various literature reviews and periodicals.

10.1.1 Definition of PPB

10.1.2 Important features of PPB.

10.1.3 The difference between program budgeting and performance budgeting.

10.1.4 Accrual versus cash accounting.

10.1.5 Scope of the program and performance budgeting.

10.1.6 Cost Definition.

**10.1.1 The PPPPB**, a unified approach to budgeting and planning, requires a shared set of concepts at the local level for effective execution and coordination among employees.

Performance budgeting is a modern method that utilizes performance indicators to efficiently allocate resources in programs. It ensures priority-setting and decision-making, based on the performance of public programs, making it an efficient budget management tool [17].

Program managers in the United States utilize the Economic Development Commission's Program and Performance Budgeting (PPB) system to accurately implement goals and compare their implementation based on time, amounts, working hours, and materials. This system provides information that traditional budgeting methods cannot provide, enabling better decision-making and focusing on government programs rather than purchasing goods and services. PPB highlights the state's new function of administrative control, highlighting the role of the state in the service of government administration, rather than focusing on traditional financial control. It is a method that aims to increase the efficiency and effectiveness of public spending by linking allocated appropriations to the results to be achieved [22].

The budget for government work categorizes expenditure items and their purpose, focusing on the task completed instead of the means used. It primarily deals with demonstrating the relationship between expenditure items and their purpose, ensuring that the budget is spent in the most effective manner [23], [24].

The government unit provides specific programs that estimate expenditures for the coming year, focusing on the effectiveness of these programs. This detailed budget data is tabulated to highlight the new function of administrative control for the state, rather than focusing on financial control, and helps to measure the results and effectiveness of these government programs [25].

The PPB is a set of objectives that are monitored and determined by breaking down funds into programs and activities, estimating the cost of each, and establishing standards and indicators to measure performance effectiveness [26].

The PPB is a budget that focuses on administrative control and rational use of financial capabilities, enhancing performance efficiency by specifying cost elements and establishing performance levels for each activity, thereby ensuring efficient use of financial capabilities [26] [27].

Program and performance budgeting is a budget system that outlines the objectives for which funds are requested, the costs of proposed

programs and activities, and the outputs or services to be produced or provided throughout the program [28].

**10.1.2 From the previous definitions**, the provided definitions enable an obvious comprehension of the main characteristics of program budgeting and performance, as follows:

- 1- The technique categorizes general budget data qualitatively, emphasizing government actions versus purchases or expenditures on goods and services [24].
- 2- Program managers can efficiently implement goals within their scope by comparing their implementation in terms of time, numbers, working hours, and resources [29].
- 3- The aim is to enhance the efficiency and effectiveness of public spending by aligning the allocation of funds with the desired outcomes [22].
- 4- Primary factors serve as a foundation for programs, influencing performance by determining outputs that serve as the foundation for funding allocation [28].
- 5- The literature recommends switching from a cash to an accrual basis since cash accounting does not provide accurate evaluations of production costs or results [26].
- 6- Appropriations are determined by setting objectives that are in line with the plans and activities [24].
- 7- The objectives set the standards and indicators used to assess achievement and performance effectiveness [26].
- 8- The state is shifting from financial control to administrative control, enhancing performance efficiency by defining cost factors and establishing performance levels for each activity, thereby enabling evaluation of actual performance [25].
- 9- The performance of programs and activities can be linked to the performance costs tabulation by switching from economic and administrative classifications to functional classifications [31].

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# **10.1.3 The Difference Between Program and Performance Budgeting:** The following table differentiates between the program and performance budgets.

Table 4: distinguishes between the program and performance budgets.

Comparison	Programs Budgeting	Performance Budgeting
Tool type	A planning tool that prepares the program budget and includes the performance budget.	A tool for implementing the program by specifying the performance units and the cost of performance in an attempt to achieve productive efficiency for uses [24].
Administrative level	It relates to the higher management levels in the administrative organization that implement the programs	Related to the lower levels of administrative organization, the performance budget relates to the smallest government units that perform a set of activities that constitute the implementation of a specific program [25].
Make decision	The program budget is useful in the follow-up and decision- making process at the ministries and higher levels.	The performance budget serves the purposes of monitoring and making decisions at the lower level [31].
Basic function	Program budgeting is concerned with classifying the budgets of various administrative units into functions and tasks, then main programs, then sub-programs, which are linked to the financial statements	Performance budgeting provides management with accurate measurement methods such as unit cost, work measurement, and performance rates [25].
The time element	Program budgets are usually linked to the future, because by their nature they are directed towards the future and their subject is the economic and social policy of the state [31]	It Is linked to the past and what has been achieved (performance) while relying on past achievement in preparing future estimates. At the same time, the performance rates that occurred in the past are taken as a basis for preparing or estimating future performance rates [24].
Precedence of setting	The program budget must take precedence in preparation than the performance budget, as specifying the programs is considered the structure or framework according to which performance is measured [24].	It comes in order after budgeting programs, as defining programs is considered the structure or framework according to which performance is measured [25].

### **10.1.4 Accrual versus cash accounting:**

Accounting standards require companies to prepare financial statements, including the cash flow statement, income statement, and statement of financial position, at the end of the fiscal year [32]. These statements, along with other financial statements, are crucial for understanding financial trends and adherence to accounting standards.

Modern accounting uses an accrual basis with multiple records, enhancing the accuracy of financial reporting [33-34].

# 10.1.4.1 Cash accounting

- The cash basis is a recording method that identifies or acknowledges transactions like revenue and expenses based on whether cash was received [33-34].
- Advantage: It is simpler to record in cash-based accounting [33], therefore the information on assets and liabilities supplied is often restricted [34].
- Disadvantage: The income statement and balance sheet, under this system, do not provide recent financial information. [33].
- In the public sector, cash-based accounting has long been employed to record transactions [34].

# 10.1.4.2 Accrual accounting

- ☑ Function: This system acknowledges transactions regardless of future currency exchange, ensuring accurate record-keeping of sales and expenses [34].
- Advantage: The accrual basis system is an important tool for publicsector organizations since it improves the accuracy of financial reporting whereas also increasing efficiency, transparency, and accountability in fund administration. This technique is highly beneficial for tracking fiscal management's performance using financial data [35].
- **Used in:** Accrual-based accounting, often known as the current accounting technique, is a method for accurately representing liabilities, assets, and equity in assets on the balance sheet [33].

# **10.1.5** The scope of program and performance budgeting:

• The highest goal for an organization is determined by its vision, mission, goals, objectives, and targets [36]. These objectives reflect the organization's strategy and are the first stage to be set, ensuring that every performance indicator is associated with these components [37].

- Performance indicators are critical for analyzing project performance at many stages, such as planning, implementation, and post-event. These indicators include inputs, outputs, results, benefits, and impacts [38]. Performance measurement is the process of calculating and collecting points by comparing them to predetermined targets [31]. It evaluates the amount to which a primary program or subprogram has met its goals and objectives, with the goal of determining levels of performance in terms of quantity, quality, and planned quality. It also aids in precisely estimating the cost of achieving objectives and allocating resources accordingly.
- Program selection entails analyzing and selecting programs based on alternative rankings, considering restricted resources, and making informed decisions about the best possibilities [37].
- Cost standard analysis determines the standard cost of a program or activity, allowing for more reasonable budget allocation. [38]

**10.1.5.1 PPB require the definition** of essential concepts such as vision, mission, goals, objectives, inputs, outputs, outcomes, benefits, and impact.

**Vision:** A futuristic vision statement is an important tool for entrepreneurs since it describes the company's future vision and serves as an entrepreneurial entry point. It tackles future uncertainty and should be brief, straightforward, consistent, and abstract. A strong vision statement should be brief, accurate, and flexible to organizational changes, while remaining broad and inclusive of a general concept rather than a specific goal. This idea provides a great entrepreneurial entrance point into the future [36].

☑ Mission: Organizations have a primary mission that defines its purpose, principal goal, and essential character. This mission serves as the cornerstone for all of their daily activities and decision-making processes. A well-defined mission statement reflects the organization's identity and helps answer essential questions about its existence, principal purpose, distinguishing characteristics, business developments in the next 3 to 5 years, primary consumers or major

market segments, primary products or services, and risk exposure. A well-written mission statement reflects an organization's identity while also answering key concerns about its purpose, primary goal, and potential hazards [36].

☑ Goals: are the ultimate objectives of an organization, serving as the end result. They can be classified into three levels: output (immediate goal), outcome expressed as objective (intermediate goal), and impact expressed as aim (terminal goal). Goals can be expressed in various forms and types to suit the organizational context, ensuring a clear and effective approach to achieving organizational goals [39].



Figure 3: Type of Goals [39].

☑ Objectives: Objectives are defined, actionable targets that must be met within a limited time frame, such as a year or fewer, in order to attain a specific goal. Objectives indicate the actions or activities required to achieve a goal [40]. Objectives should be SMART (Specific—target a single area for improvement). Measurable: quantify or suggest a measure of progress. Approachable: define who will handle it. Realistic: specify which outcomes can be realistically attained given the current resources. Time-related: define when the desired result(s) can be accomplished. [41] [42].

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- Input: is a resource used in a process to generate a predetermined output. Indicators of inputs include funding, human resources, facilities and infrastructure, data, and other required information [22], which are used to evaluate available resources and necessary activities to achieve the desired goals and results [37].
- ☑ Output indicators compare the actual amount of output to the planned results [37, 22]. They are quantifiable in terms of quality, quantity, and time required to develop or submit output. These indicators assist in determining the cost of implementing major initiatives and sub-programs, ensuring that the actual level of output is compared to the expected outcome [22].
- ☑ Outcome: The prepared action symbolizes the efficacy of performance and results, which are short-term outcomes that may be applied immediately [43]. Results are the level of performance or achievement attained while providing a service or commodity, and they are related to the entity's strategic policy objectives. The results-based management approach strives to eliminate central control while allowing managers to work within budget, select office and purchase locations, and work efficiently within their units [22]. This strategy assists governments in measuring progress toward intended development goals and avoiding poor performance due to the inability to select the most efficient input for obtaining desired results [28].
- **Benefit** A benefit is the increased value of an outcome that will be seen later. Indicators demonstrate the benefits of what is projected to be obtained if the output is completed and operates properly [37].
- **Impact**: refers to the ultimate goal reached by the implementation of a project or program, which may take years or more to become evident or occur, culminating in a change or effect [22].
- A program is a set of processes, activities, and projects undertaken by entities to produce outputs or services that align with the state's strategic objectives [22].

- Sub-programs are activities, operations, and projects that are part of the primary program [22].
- **Project** refers to the investment activity, whether new, replacement, or renewal, and its completion [22].
- Activities: represent the processes and procedures within a unit serving as the core of the organization's overall work [44]. A homogeneous type of work whose goal is to contribute to the achievement of the final product of the program [24].
- Effectiveness: The desired goal has been met, however it may have resulted in extravagance and waste of available resources. The link between cost and return, as assessed by actual or expected outputs [24], may not be correct. As a result, efficacy is critical in ensuring that the desired aim is met, despite potential resource waste and extravagance.
- Efficiency is defined as the relationship between resources and outputs, as measured by unit cost of output [27]. It entails achieving objectives at the lowest possible cost, which is then measured using outputs or inputs that require:
  - Careful study of the desired goal
  - Determine the expenditures associated with achieving this goal and the standards and indicators for performance evaluation.
  - The efficient use of available resources requires linking costs to expected return and determining opportunity cost.
  - The concept of continuous follow-up in programs is a permanent approach to ensure optimal performance, ensuring continuous improvement and effectiveness [25].

10.1.6: **Cost:** is the monetary value of all expenses, resources, and efforts expended in the creation and delivery of goods and services [46-47]. It comprises both explicit and implicit expenses, which are classified as explicit and implicit. While all expenses are considered costs, not all spending made when purchasing income-generating assets are considered expenses. Cost theory can be divided into two categories:

conventional and modern [45], emphasizing the necessity of understanding and successfully controlling costs [45-46-47]



Figure 4: Concept of the Cost

**10.1.6.1 Cost Elements:** the next figure summarized the elements of the cost [48]



Figure 5: Element of the Cost

**6.1.6.2 Costs classification:** Costs are classified based on their common features, a systematic placement of similar items. This process helps in grouping costs together, serving different purposes and ensuring efficient management of resources [49].

Direct and indirect cost:

• **Direct Costs** are immediately recognized as a unit of product or cost object, such as raw material costs and machine operator wages. These costs are plainly identifiable, such as the cost of steel needed to manufacture a machine or the salary paid to a tailor in a readymade garment company. These expenses are critical in calculating the total cost of a product [50-49].



Figure 6: Classification of the Cost

• **Indirect cost**: are generic costs that cannot be clearly associated with a specific cost object, such as machinery depreciation, insurance, lighting, power, rent, managerial wages, and repair supplies. These costs are incurred for the benefit of numerous cost units, procedures, or departments, making it impossible to determine their exact cost. [50-49].

# A.Fixed and Variable cost

• **Fixed cost** refers to one that remains unchanged in response to shortterm fluctuations in activity volume. These expenditures are unaffected by a momentary increase or decrease in an enterprise's activities. These are also referred to as period costs. For example, consider rent and depreciation [48]. Mohamed Ramadan Youssef, Mohamed Abdelsalam Ahmed, Samir Abul-fotooh Saleh

- Variable Cost: the cost of elements varies directly with the volume of activity. The variable cost consists of two elements. (I) Variable direct expenses; (ii) Variable indirect costs. Variable indirect costs are called variable overheads. Example: direct labor, external freight [48].
- B. Committed and Discretionary: this classification is based on the extent to which a company is tied to an asset or service that creates the fixed costs. This classification is significant in terms of cost control and decision-making [49].
- **Committed Cost**: the costs associated with maintaining physical facilities and the managerial structure. Such expenses are committed in the sense that once decided upon, they are inevitable and invariant in the short term. For example, the managing director's pay may be considered a committed expense if policy requires that the managing director not be refunded unless the firm is dissolved. Similarly, depreciation of plant and equipment is committed since these assets cannot be easily altered in the short term [47].
- **Discretionary Cost:** in the short term, management actions can help to minimize discretionary costs, such as low-level manager pay, by reducing or eliminating these expenses. [47].
- C. Product costs and Period costs:
- product costs: a manufacturing company incurs costs related to obtaining or manufacturing a product for sale, which are accumulated in inventory accounts and expensed as the cost of goods sold at the point of sale [51]. These costs, known as product variable cost, are crucial for the company's operations [52].
- **Period costs:** Period costs are general, selling, and administrative expenses incurred during the period of economic sacrifice. (Compare with product costs.) [51] Periodic cost is also known as product fixed cost [52].
- **D.Controllable and non-controllable costs:**
- **Controllable costs** are those that can be directly controlled at the managerial level.

**Non-controllable Cost** refers to the cost that cannot be controlled at any level of managerial supervision [50].

# E. Historical and pre-determined cost:

- Historical Cost: the actual costs of acquiring assets or producing goods or services [50], are depicted in financial statements, while the accounting system records only the original cost of the assets, which can potentially mislead users in decision-making [52].
- Pre-determined costs are predetermined costs for a product, calculated in advance of the production process, based on cost data and factors affecting costs, which can be either standard or estimated [50].

Normal and abnormal costs: This management accounting approach classifies costs as normal or abnormal.

- The normal are unavoidable in all cases, but they must be controlled [52].
- The abnormal costs are those incurred as a result of uncontrollable causes such as natural disasters, fires, theft, and so on. [52].

# 10.2 Second Section:

Analytics study to the Presidential Resolution on Local Unit Establishment, administrative structure, and functional classification to determine the strategic goals of the Ministry of Local Development, governorates, and local units, as well as the main and sub-programs at each level.

# **10.2.1 Determination of the goals of government units for programs and projects:**

Egypt, as a United Nations Member State, adopted the Sustainable Development Goals in 2015, which aim to eradicate poverty, improve health and education, reduce inequality, and stimulate economic growth [2-53-54]. Mohamed Ramadan Youssef, Mohamed Abdelsalam Ahmed, Samir Abul-fotooh Saleh



Figure 7: UN SDGs [54]

Based on SDGs, Egypt has developed its vision of 2030 to implement those goals and developing localities, this strategy includes three dimensions: Social, Economic, and Environmental [53].



Figure 8: Dimensions of Egypt's Vision 2030 to achieve SDGs [53]

According to Egypt Vision 2030, Sustainable Development Strategy the Section two from questionnaire came to determine the goals that government units wish to implement and distribute those goals to programs and projects through the five pillars as shown in the following figure [2].



Figure 9: Egypt Strategic to Vision 2030 for Sustainable Development [2]

The researcher assessed the current status of localities through a functional classification of PPPPB [24], utilizing questionnaire results, literature studies, and government work programs as follows:

• Work must be completed at four levels: (1) the state's strategic goals; (2) the level of the Ministry of Local Development; (3) the level of governorates; and (4) the local units connected with each governorate.



Figure (10): Functional classification of the proposed framework for PPPPB for localities

### **10.2.1.1 First Level: the level of government work:**

**1- Main Programs**: The strategic goals at the state level are represented by five pillars, each under a group of main government work programs, as illustrated in the below figure.



Figure 11: Functional classification levels of the government work program in localities to PPPPB

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**2- Sub Program**: the figure below explains the fifth main program of the government and its sub-programs, highlighting the existence of a group of sub-programs within each main program.



Figure 12: Sub-programs that fall under the third main program of the government's work programs

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### 10.2.1.2 Second Level: The MLD level:

• **Main Programs**: The Sub-programs at the government work level represent the main programs (parents) of the MLD as suggested and explain in the next figure.

### Main Programs to MLD

- 1-The first sub-program: Paving roads, bridges, tunnels, ferries, and establishing road stops
- 2-The second sub-program: Laying and strengthening electricity and lighting networks
- 3-The third sub-program: Environmental improvement program.
- ✤ 4-The fourth sub-program: Supporting the needs of local units.
- 5-The fifth sub-program: Economic development of local resources.
- 6-The sixth sub-program: development of Egyptian villages.
- 7---The seventh sub-program: Implementing home sanitation connections for vulnerable families
- 8-The eighth sub- program: developing the most dangerous railway slides
- 9- The ninth sub- program: improving environmental conditions in the poorest villages
- 10- Sub- program: Raising the efficiency and development of slaughterhouses in the governorates
- 11-The eleventh sub- program: Developing family income in rural communities
  - 12- The twelfth sub- program: Developing the infrastructure for poor communities

#### Figure 13: Main Programs to MLD

### • Sub Program

There is a relationship between the main program to MLD and the sub program. Each main program contains one or more subprograms, as shown in the following examples:

Table 5: Affiliated suggested sub-programs to MLD

First Main program:								
Paving roads, bridges, tunnels, ferries, and establishing road stops								
Affiliated sub-programs								
1-Paving roads								
2-Interlocking tile cladding								
3-Construction and upgrading bridges, tunnels, and ferries.								
4-Construction of road parks for mass transportation inside the governorates.								

Table 6: Affiliated suggested sub-programs to MLD

Second Main program:

Laying and strengthening electricity and lighting networks

### Affiliated sub-programs

1- Laying and strengthening electricity networks

2- Purchase and supply of lighting equipment.

Table 7: Affiliated suggested sub-programs to MLD

### Third Main program: Environmental improvement program.

Affiliated sub-programs

1- Street cleaning and solid waste management.

2-Street planting and developing gardens and nurseries.

3-Using natural alternatives and making good use of resources.

4-Developing and establishing slaughterhouses.

5-Dealing with canals and drains.

Table 8: Affiliated suggested sub-programs to MLD

#### Fourth Main program: Supporting the needs of local units.

Affiliated sub-programs

1-Security, fire and traffic

2-Raising the efficiency of municipal buildings

3-Crisis management and political communication program

4-Establishing and developing technological centers

5-Construction and development of spatial variable buildings

6-Establishing public transportation stops.

7- Establishing and developing markets and Renting spaces.

Table 9: Affiliated suggested sub-programs to MLD

#### Fifth Main program:

Economic development of local resources.

### Affiliated sub-programs

1- Collection of service fees

2-Preparing consulting centers to serve researchers and students in the field of local development for fees Mohamed Ramadan Youssef, Mohamed Abdelsalam Ahmed, Samir Abul-fotooh Saleh

### 10.2.1.3 The third Level: The Governorates level. 1. Main Programs:

The Sub-programs at the MLD level represent the main programs (parents) of the Governorates levels as explain in the next figure, For example.



### **10.2.1.4 The Fourth Level: The Local Units level:**

The sub-programs at the governorate level represent the main programs at the local unit level, under which the sub-level (activities/projects) falls, which is the smallest unit on which performance indicators depend. The following figure shows the basic programs and their activities.



Figure 15: The Local Units level



### **10.3 Third section:**

**10.3.1An analytical evaluation of the current documentation cycle to derive a schedule for the cost of each activity,** through which the time spent by an employee for a specific activity in various departments (warehouse management, contracts and procurement, budgeting, accounts, planning) can be calculated, and thus the direct costs charged to that activity can be calculated as it is, as shown in the following table Table 10: schedule for the cost of each activity

Serial	Work Phase	Tir	ne in	minu	ites	Tin	ıe iı	1 hou	rs	Wo	rki	ng o	lay	Week
-	Collection alorification and analysis of mode	10	15	20	30	1	2	3	4	1	2	3	4	1
1	Collection, classification, and analysis of needs.													
	writing a memo to convey the issue to the													
2	competent authority, issuing a committee													
	normation resolution, and establishing the													
	The committee's formation mama datailing													
	The commutee's formation memo, detailing													
3	signed by a competent employee in the Contracts													
	and Progurament department													
	The Contracts and Procurement department													
4	manager signs and approves the committee's													
	formation memo													
	Submission of the committee's formation memo													
5	to the Secretary General's Office for approval.													
	Receiving the approved committee's formation													
6	memo from the Secretary General's Office.													
	The announcement and publication of needed													
_	items and quantities, tender opening dates, in the													
7	official newspaper, and on the government													
	contracts portal.													
	Providing estimated price offers based on market													
8	prices and technical specifications.													
	Opening the technical envelopes and sorting bids													
9	by the competent authority-approved envelope													
	opening committee.													
	A designated subcommittee checks received bids													
10	and prepares a detailed technical report for													
	submission to the awarding committee to													
	complete the awarding process.													
	The designated subcommittee oversees the													
	process of evaluating bids, including excluded													
	and rejected ones. It provides a comprehensive													
11	technical report detailing accepted and excluded													
	bids, outlining grounds for exclusion and													
	rejection to the awarding committee. The													
	subcommittee also determines the opening date													
	The approved hids are presented to the awarding						$\left  \right $							
	committee for finalization ensuring the lowest													
12	price is achieved through the technical envelope													
	opening process													
	opening process.													

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		Tir	ne in	min	utes	Tin	e is	a hor	urs.	We	rki	ng	dav	Week
Serial	Work Phase	10	15	20	30	1	2	3	4	1	2	3	4	1
	The awarding committee takes financial and													
	legal steps to prepare a financial statement for all													
13	technically accepted bids, ensuring that the													
13	lowest possible costs are met. To award the													
	lowest bid, the committee's head evaluates the													
	estimated value to the lowest pricing and bids.													
	The competent authority approves the awarding													
14	minute to proceed with the legal and financial													
	measures required by law.													
	The successful bidder is notified of the													
	procedures taken following the expiration of the													
15	legal term specified in the competent authority's													
	approved awarding minute. He or she obtains a													
	10-day grace period.	<u> </u>		<u> </u>	<u> </u>									
	The successful bidder will either pay the													
16	performance bond value in cash at the													
	administrative entity's Treasury or with a													
	banking letter of guarantee.	<u> </u>		<u> </u>										
	The administrative entity issues a supply order													
	that details the required items and quantities, as													
	well as the general and private contractual terms													
17	and conditions. Based on the invitation to bid,													
	enter into a supply contract or contractual													
	arrangement in accordance with the Council of													
	State's Legal Advice and Legislation													
<u> </u>	The company delivers the items of the supply	-	-	-	$\vdash$	-	$\vdash$	-	$\vdash$	-	$\vdash$			
	order to the administrative entity on the stated													
	dates and the supply order is entered into the													
18	administrative authority's warehouse													
	management system along with the electronic													
	invoice submission.													
	The inventory department will inspect the items													
	supplied by the selected bidder and then deliver													
19	them to the contracting department to complete													
	the work.													
	The Contracting Department collects documents													
	related to the proposed tender, submits a detailed													
	memo to the competent authority for approval,													
20	prepares the 50 GA1 form, has it approved by the													
	authority, authorizes the item, and delivers it to													
	the administrative authority's accounts													
	department.													
21	The contracting and purchasing department													
	complete the 50 GA form after gathering all													
	inspection minutes and inventory item additions													
	forms.													
22	The competent employee signs the 50 GA form							-						
	The budget or planning department authorizes													
23	the disbursement from the budget line item.													
24	The planning manager approves the 50 GA form.													
25	The contracting manager approves the 50 GA													
25	form.													
26	The financial general manager approves the 50													
	GA form.													
27	The secretary general manager approves the 50													
	Delivery of the 50 GA form to the accounting		-					-			$\vdash$			
28	department to issue a payment order													
	separatent to issue a payment order.	-		L	-				_					

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# **10.3.2** Stages of submitting General Accounts Form 55 to the Accounting Department and issuing a payment order

The Department of Accounting is responsible for scheduling human resource expenditures as direct costs within the program and performance documentary cycles.

Carial	Werk Dhees	Ti	ne in	minu	tes	Ti	mei	in ho	urs	Working day				Week
Serial	work Phase	10	15	20	30	1	2	3	4	1	2	3	4	1
	Receiving the 50 GA form at the accounting													
1	department following authorization from book													
	55.													
2	The 50 GA form is distributed to the competent													
	auditor.													
	The competent auditor checks the disbursement													
3	authorization from budget line items in													
	accordance with the classification of the state's													
	general budget.													
	Verify the validity of the disbursement of the 50													
4	GA form in terms of (permission letter from the													
	department head, price quotations, and													
	purchase method).													
_	Upon completion, the form will be approved by													
5	the Accounts Manager. The information is then													
	entered into the following bookkeeping system:													
6	Registration in Book No. 24													
7	Registration in Book No. 81													
8	Registration in Book of taxes													
9	Registration in the Book of Miscellaneous													
	Deductions.													
10	Registration in the GFMIS System.													
	The manager enters the 50 GA form again to													
11	credit or post it to the GPS system, thereby													
	creating a payment order and indicating the													
	customer's payment.													
	The electronic payment order is printed and													
12	attached to Form 50 GA for the manager's													
	approval.													
13	The general secretary approves the department													
	head's signature as the first.													
14	The general secretary approves the accounts													
	head's signature as the second.													

Table 11: Documentary Cycles for Form 55 According to Time

### **10.3.3** Calculating the direct costs of vehicle fuel consumption:

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Calculating the direct costs of vehicle fuel consumption is crucial for businesses. Factors such as engine size, fuel type, road terrain, and other factors influence fuel consumption rates. To calculate these costs, data on cars owned by the entity, timetables for Umrahs, and vehicle itinerary must be provided. A service database on cars owned by the organization can be used to provide this information. The below entry form helps with entering data on cars owned by the organization and accurately calculating the direct costs associated with fuel consumption.

• Vehicle condition statement form.

Car Code:	Car Code:	
Car Number	Car Number	
Car Purchase Year	Year	
Sometical Start Data	Car Nodel:	
Service Start Date	Car Description:	
Car Type:	Car passenger capacity	
Car Model:	Number of cylinders:	
Car Description:	Car passenger capacity	
Car passenger capacity	Statement of Years Use	
Number of cylinders:	Overhaul Number	
Type of Fuel Used	Overhaul Date	
Type of Fuel Used	Type of Fuel Used	

Figure 16: A Form for Entering Data on Cars Owned by the Organization



Car Code:	
Name of the Car Driver:	
Car user name:	
Mission location:	
Urban / Rural	
Project Code:	[]
Start Mission Date:	
End Mission Date:	
Start Mission Time:	
End Mission Time:	
Reading the odometer before the Mission:	
Reading the odometer After the Mission:	
Determine distance using GPS:	

Figure 18: Car Itinerary Model

# **10.3.3.1** Methods for calculating fuel consumption:

In this research, two methods will be used to calculate the amount of fuel consumed, as follows:

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# The first Method:

The fuel consumption rate can be calculated in the traditional way, which is:

Fuel consumption = distance traveled / amount of fuel used = ..... km/liter.

- Fill the fuel tank completely and record the car's odometer, then, let's say, 70,000 km.
- Drive the vehicle a certain distance, for example, 100 km.
- Fill the fuel tank again to find out how many liters are needed to cover a distance of 100 km.
- Suppose the vehicle needed 50 liters.
- Now fuel consumption = 100 km / 50 = 2 km/l = 0.5 L for each kilometer.

Here we conclude that the vehicle's fuel consumption rate is one liter per 2 km

Then **Fuel cost** = fuel price in liters x the amount of fuel consumed.

# The Second Method:

Fuel consumption is determined by utilizing Periodic Books No. 3 of 1996, No. 4 of 2000, and No. 11 of 2002 of the General Authority for Government Services, which outline rules for fuel consumption per kilometer based on car condition and distance traveled (urban or rural).

# **10.3.3.2** Calculating the direct costs of the car driver's time on a mission related to a specific project for the project (DCCD):

The driver's time spent driving the vehicle for a specific mission for a specific project can be calculated in the following way:

• Determine the mission time (MT) from the car itinerary form No. (8).

• The total number of working hours of the car driver per month (NWHD) = number of working days per month x number of working hours per day.

• The Cost of an Employee's working Hour (CEH)= monthly salary / NWHD

# DCCD = MT x CEH the value by bound. 10.3.4 Calculating the direct costs of electricity:

There is a problem in consumption of shared resources such as electricity particularly relevant in workspaces where multiple projects share the same space, thus the solve to this problem is using smart metering but it's expensive for that by So, by designing proto metering model that can measure current voltage, current and total consumed power resulting from multiplying voltage x current and record their value on cloud computing through IOT by Internet Protocol (IP). This makes digital transformation technology capable of managing and consuming shared electrical resources efficiency. The next table can be explaining the calculated consumed power by using proto metering model.

Table 19: calculate consumed power by using proto metering model

Department code	Voltage	Current	consumed power	Time	Date

By join this table (19) with table 16 and 17 we can calculate time of each project and consumed power the framework can calculate the direct cost of consumed power of each project.

### **10.4 Fourth Section: Architecture of APPPPBS**

- The digital transformation components that form the foundation for APPPBS architecture include:
- Technologies:
  - Analytics Automaton
  - Cloud computing (SaaS). IOT.
- Process:
  - organizational culture
  - Data Governance/Business( PPPPB)
  - Innovation new services.
- Goals:

Create a framework for a service application for the PPPPB.



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# Figure 19: Architecture of the APPPPB Service APPPPBS Development Life Cycle:

The APPPPBS Development Life Cycle Model will used Iterative model depend on two stages as shown in figure 20:

- The First one is Requirement gathering and analysis.
- The Second stage is the cycle of iteration which consists of (Design, Implementation, Testing, Deployment, Revie, and Maintenance).



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Figure 20: APPPPBS Development Life Cycle Model used Iterative Model

# **11- Research Results:**

- Applying the framework eliminates the need to budget for line items.
- Program and performance concepts have become clear and ready as a specific approach for holding training courses to develop human resources.
- A framework has been created for the main programs and proposed sub-programs for localities in line with Egypt's Vision 2023.
- The proposed models and equations propose charging each project's direct costs to the project itself after calculating indirect costs such as car fuel, lights, human resources, accounting, budget, and direct project work, rather than Chapter Six personnel.
- A viable program and performance framework now exist.

# 12-Conclusion

- 1- The proposed models and equations suggest charging direct costs of each project to the project itself after calculating indirect costs, such as vehicle fuel, lighting, human resources, accounts, budget, and direct work in the project, rather than from Chapter Six employees.
- 2- The study proposes a handbook to standardize and harmonize methods and concepts in local budgeting programs and performance.
- 3- The service application, developed by administrative authorities, is aimed at digital transformation and streamlining program budgeting and performance. It aligns with Unified Public Finance Law No. 6 of 2022, utilizing smart systems and applications to prepare and implement budgets, as per the Official Gazette.
- 4- Creation of the following program:
  - 4-1.1 Spaces rental.
  - 4-1.2 Advertising licensing.
  - 4-1.3 Markets.
- 5- The company offers specialized training courses in activity-based cost accounting, providing hands-on instruction on executing the designed systems.

- 6- The plan entails restructuring the administrative structure of governorates and local units, thereby establishing a department for programs and performance.
- 7- The accounting system will undergo a modification to enable consistent comparisons of financial performance, transitioning from a cash basis to an accrual basis, thereby ensuring a more accurate analysis of government spending.
- 8- An accounting system is crucial for tracking costs and time-oriented activities, ensuring accurate financial reporting and management.
- 9- The accrual basis is a method used in economic units to provide accurate cost numbers, effective control over cost elements, and contribute to continuous development considerations, rather than the cash basis.
- 10- The process involves connecting the final account computation and financial reports to goals and programs to ensure a balance between each administrative entity's programs and performance.
- 11- The GFMIS system will be modified to align real costs with programs and objectives, enabling measurement of results and performance indicators under Article 68 of Consolidated Public Finance Law No. 6 of 2022.
- 12- Article 50 of Unified Public Finance Law No. 6 of 2022 mandates a legal amendment for administrative entities to maintain a set of documents, books, and accounting forms. Amendments or cancellations are prohibited. Paper or electronic accounting must be used until written authorization from the Ministry is obtained, strictly in accordance with executive regulations.
- The performance budget and draft program are developed with internal control and trust in mind. Additional records and forms are used to maintain trust, with electronic signatures replacing manual ones in the process until confidence is established.
- Departments located at governorate headquarters
- Governorates headquarters and subordinate local units.
- Governorate headquarters and the Ministry of Local Development.

- Governorate headquarters and the National Investment Bank.
- Governorate headquarters and the Ministry of Finance.
- Governorate headquarters and auditors affiliated with the Accountability State Authority.
- Governorate headquarters and auditors affiliated with the Central Agency for Organization and Administration.
- Governorate headquarters and the Ministry of Planning and Economic Development.

Administrative authorities utilize institutional codes for financial correspondence and instructions, as per Article 73 of the Unified Public Finance Law No. 6 of 2022. These codes, along with financial approvals sent via automated systems, are considered communications, with official approvals being the original approved documents.

### **Economic Reason:**

- Reduces paper usage by up to 95%, resulting in cost savings on paper imports.
- ✓ Providing substantial consumption of gasoline, diesel, oils, and maintenance materials for vehicles used to transport employees of the aforementioned organizations.
- ✓ Providing transportation allowances to employees who travel between the aforementioned businesses to deliver paperwork.
- ✓ Saving money on fuel, paper, and running supplies.

# **Environmental benefits:**

- ✓ Lowering gasoline consumption not only reduces pollution but also enhances overall health.
  - 13- The Ministry of Finance reviews local inputs from the Ministry of Local Development and Governorates, allowing users to read reports and make modifications for localities.
  - 14- Video conference meetings for program and performance budget discussions save costs on printing, paper, and transportation while maximizing time.
  - 15- Proposing to distribute this service from the Ministry of Finance to all budgetary units inside the Arab Republic of Egypt.

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