# INFORMATION SYSTEMS DESIGN AND DEVELOPMENT


ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΑΤΤΙΚΗΣ
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## DEPARTMENT OF COMPUTER ENGINEERING AND INFORMATION TECHNOLOGY

## SEMESTER WORK

# Development of a Unified Information System to Support Operational Operations of Health Units: Cash Management Subsystem

**STUDENT DETAILS**

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# INFORMATION SYSTEMS DESIGN AND DEVELOPMENT

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# 1. Introduction

## 1.1 Project description

The project concerns the development of the "Unified Information System for the Support of the Operational Functions of Health Units of the National Health System", which aims to improve the management of financial, accounting and administrative processes of health units. The system is commissioned by the Electronic Governance of Social Security (EDIKA) S.A. and includes various subsystems, including "Cash Management", "General Accounting" and "Budget".

## 1.2 Purpose of the work

This work aims to create a comprehensive proposal for the "Cash Management" subsystem, which is called upon to cover the needs of managing financial transactions with suppliers, monitoring debts and executing payments. The aim is to develop a solution that meets the requirements of the declaration and ensures efficiency, interoperability and compliance with modern standards.

## 1.3 The Cash Management subsystem

The "Cash Management" subsystem is responsible for managing transactions with suppliers, monitoring open liabilities and issuing payments. It includes functions such as:

- Reconciliation Accounts – Ensuring accuracy in matching invoices and orders
- Invoice Entry – Processing and checking supplier invoices
- Supplier Payments – Integration with “General Accounting” and issuance of funds
- Printouts – Provision of balance sheets, supplier records and reports

The system operates in conjunction with the "General Accounting" and "Budget" subsystems, ensuring accurate data updates. Its design includes the Contextual , Conceptual and Logical levels , as defined by Zachman Framework .

# 2. Development Methodology

## 2.1 Choice of development methodology

The methodology chosen for the development of the system is SCRUM , one of the agile software development methodologies. SCRUM is suitable for projects that require flexibility, continuous adaptation to requirements and close collaboration between the stakeholders. It is based on short development cycles ( sprints ), where each cycle produces a functional deliverable.

SCRUM methodology emphasizes:

- Flexibility and adaptability to project requirements.
- In continuous cooperation and communication between the bodies involved.
- Continuously evaluating progress and incorporating improvements.

## 2.2 Justification of suitability for the project

SCRUM methodology is based on the following points:

1. Flexibility and Response to Changes
    - The project includes multiple subsystems (Cash Management, General Accounting, Budgeting) that require continuous adaptation to requirements. SCRUM supports change management through continuous review of deliverables ( sprint) reviews ).
2. Collaboration and Continuous Communication
    - SCRUM enhances collaboration between stakeholders such as the development team and the IT department, through daily meetings ( stand - ups ) and evaluations at the end of each cycle ( sprint). reviews ).
3. Short Development Cycles
    - Sprints allow for the gradual development of functional deliverables. This reduces the risk of failure and provides early identification and resolution of problems.
4. Risk Reduction
    - SCRUM facilitates early identification of risks and integration of changes, ensuring project quality and compliance.
5. Interoperability and Interfaces
    - Continuous testing and adaptation ensure smooth integration of subsystems, as well as accurate communication between subsystems.

## 2.3 Project requirements

The basic requirements that make SCRUM suitable are:

1. Subsystem Complexity
    - The project involves the integration of different subsystems with interoperable requirements. SCRUM allows the development of each subsystem separately with gradual integration.
2. Demand Capacity
    - The project's operational and regulatory requirements may change during development. SCRUM supports the incorporation of these changes in subsequent sprints .
3. Time Limits
    - SCRUM allows the development of functional deliverables within strict time frames, meeting priorities related to project deadlines.
4. Interoperability Requirement
    - The system must ensure accurate information and communication between the subsystems (Cash Management, General Accounting, Budget), and provide real-time information.

## 2.4 Advantages

SCRUM offers significant advantages, which make it a suitable choice for the development of complex projects, such as the "Treasury Management" information system for the National Health System .

- Speed – Allows for the production of functional deliverables in a short period of time. With short development cycles ( sprints ), the team can deliver fully functional parts of the system every two to four weeks.
- Collaboration – Daily stand - ups ensure that everyone is aware of the project status and contributes to problem solving. Sprints Reviews enable development teams to provide immediate feedback that contributes to improving the functionality and quality of the project.
- Flexibility – Incorporating changes is crucial for complex projects where requirements change over time. Changes to requirements can be added in subsequent sprints without affecting the overall progress of the project.
- Risk Reduction – Continuous review and improvement reduces the risk of failure. SCRUM identifies and addresses risks directly through daily meetings and interim deliverables. Each sprint allows for the evaluation of each development cycle, helping the team learn from mistakes and improve its processes.

### 2.5 Risk Management

SCRUM provides tools and practices for early detection and effective risk management. These tools allow for the identification of potential problems at an early stage and the implementation of corrective actions before risks develop into serious obstacles.

- Daily Meetings – They provide an opportunity for the team to immediately identify problems or obstacles, where each member reports their progress, what they plan to do next, and if they are facing any obstacles. Everyone involved is aware of the situation and makes immediate decisions by assigning tasks to specific members for resolution.
- Development Cycle Reviews – After the end of each sprint, the team meets to evaluate the process and identify ways to improve. Identifies weaknesses, e.g. delayed deliverables due to poor communication. Incorporates improvements into subsequent sprints and ensures that the team learns from mistakes and does not repeat them.
- Interim Deliverables – SCRUM is based on the creation of operational deliverables each sprint , which enhances early risk detection through stakeholder reviews and feedback. Also, instead of the team waiting until the end of the project to deliver the complete system, delivery is done in stages. This way, problems are identified and fixed earlier.

## 3. Physical Object and Project Structure

### 3.1 Description of the physical object

The physical scope of the work concerns the development and integration of the "Cash Management" subsystem within the framework of the "Unified Information System for the Support of the Operational Functions of Health Units of the National Health System". This subsystem is called upon to support the management of financial transactions between health units and suppliers, with an emphasis on automation, accuracy and security.

#### 3.1.1 Main characteristics of the subsystem

1. Unified Transaction Management
    - Registration and control of supplier invoices.
    - Correlate invoices with orders to ensure accuracy.
    - Real-time update of General Accounting.
2. Obligations Monitoring
    - Update of open liabilities and payment forecasts.
    - Providing tools for liquidity planning.

3. Supplier Payments
    - Issuance of money orders.
    - Management and monitoring of payment orders in collaboration with the Budget system.
4. Printouts and Reports
    - Issuance of balance sheets, supplier records and list of basic files.
5. Interoperability
    - Continuous interface with the General Accounting and Budget subsystems for accurate financial monitoring.

### 3.1.2 Role and Importance

The "Treasury Management" subsystem plays a crucial role in the effective management of the financial resources of the National Health System, ensuring:

- Accurate recording of transactions.
- Compliance with regulatory requirements.
- Supporting programming through data analysis.

## 3.2 Analysis of the project structure

The analysis of the project structure is carried out using the Work diagram Breakdown Structure ( WBS ), which breaks down the project into individual phases and activities. The diagram was implemented with the MS tool Visio .

### 3.2.1 Work Diagram Breakdown Structure ( WBS )

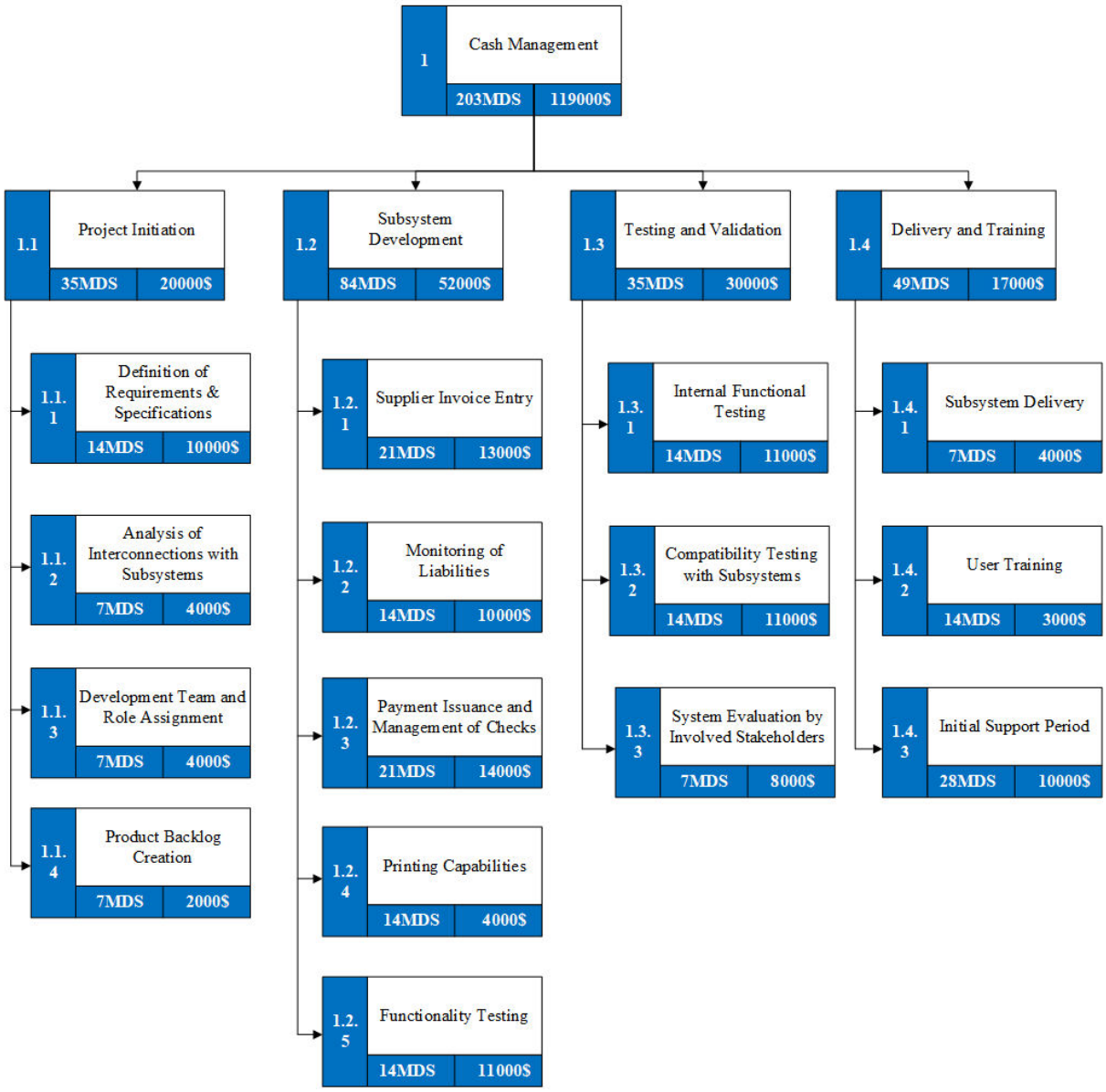


**Figure 1.** Work Breakdown Structure in MS Visio

**<u>Cash Management (Duration: 203 MDS / Cost: $ 119,000 )</u>**

**Phase 1: Project Start (Duration: 35 MDS / Cost: $ 20,000 )**

This phase is the initial stage of the project, where the preparation and foundation of the development plan takes place. It includes:

1. **Requirements and Specifications Definition (Duration: 14 MDS / Cost: $ 10000 )** – In this activity, the project needs, the subsystem functional requirements, and the technical specifications are determined.

2. **Analysis of Interconnections with Subsystems (Duration: 7 MDS / Cost: $ 4000 )** – The interdependencies of the Cash Management subsystem with General Accounting and Budgeting are examined.
3. **Development Team Formation and Role Assignment (Duration: 7 MDS / Cost: $ 4000 )** – The development team is formed and roles are assigned according to experience and project needs.
4. **Product Creation Backlog (Duration: 7 MDS / Cost: $ 2000 )** – The backlog is compiled for the functions and features that will be implemented in the next sprints .

**Phase 2: Subsystem Development (Duration: 84 MDS / Cost: $ 52000 )**

In this phase, the development of the main functions of the subsystem takes place through the SCRUM methodology . It includes:

1. **Supplier Invoice Entry (Duration: 21 MDS / Cost: $ 13000 )** – The function of importing and managing invoices in the system is implemented.
2. **Obligations Tracking (Duration: 14 MDS / Cost: $ 10000 )** – Tools are created to manage and track open obligations, such as overdue debts.
3. **Issuance of Payments and Check Management (Duration: 21 MDS / Cost: $ 14000 )** – The process of executing payments and managing checks is being designed, with automatic updating of General Accounting.
4. **Printing Capabilities (Duration: 14 MDS / Cost: $ 4000 )** – The ability to create reports and prints, such as balance sheets and supplier records, is provided.
5. **Interoperability Testing (Duration: 14 MDS / Cost: $ 11,000 )** – The smooth cooperation of the Cash Management subsystem with the other systems is checked.

**Phase 3: Testing and Validation (Duration: 35 MDS / Cost: $ 30,000 )**

This phase focuses on ensuring the correctness and functionality of the system. It includes:

1. **Internal Functional Testing (Duration: 14 MDS / Cost: $ 11000 )** – The development team performs testing to ensure that each function works according to specifications.
2. **Interoperability Check with Subsystems (Duration: 14 MDS / Cost: $ 11,000 )** – Ensures that the subsystem collaborates efficiently with “General Accounting” and “Budget”.
3. **System Evaluation by Stakeholders (Duration: 7 MDS / Cost: $ 8000 )** – Bodies such as the Hellenic Water and Sewerage Authority evaluate the system and provide feedback.

**Phase 4: Delivery and Training (Duration: 49 MDS / Cost: $ 17000 )**

The final phase includes the delivery of the system and user training. It includes:

1. **Subsystem Delivery (Duration: 7 MDS / Cost: $ 4000 )** – The system is delivered ready for use.
2. **User Training (Duration: 14 MDS / Cost: $ 3000 )** – Health unit staff are trained in the use of the system.
3. **Initial Period Technical Support (Duration: 28 MDS / Cost: $ 10,000 )** – Technical support is provided to address any problems during the initial phase of operation.

## 3.3 Time programming

The time planning of the "Treasury Management" project was carried out using a Gantt chart , which captures the main phases, activities and their dependencies. The chart was implemented with the MS Project tool.

| | Task Name | Duration | Cost | Start | Finish | Predecessors | Resource Names |
|---|---|---|---|---|---|---|---|
| 1 | **Cash Management** | **203 days** | **$119,552.00** | **Mon 17-02-25** | **Mon 08-12-25** | | |
| 2 | **Project Initiation** | **35 days** | $20,160.00 | **Mon 17-02-25** | **Tue 08-04-25** | | |
| 3 | Definition of Requirements and Specifications | 14 days | $9,520.00 | Mon 17-02-25 | Fri 07-03-25 | | Project Manager,Requirements Analysts |
| 4 | Analysis of Dependencies with Subsystems | 7 days | $4,200.00 | Mon 10-03-25 | Tue 18-03-25 | 3 | Requirements Analysts,Developers |
| 5 | Formation of Development Team and Role Assignment | 7 days | $4,480.00 | Wed 19-03-25 | Fri 28-03-25 | 4 | Project Manager,Developers |
| 6 | Product Backlog Creation | 7 days | $1,960.00 | Mon 31-03-25 | Tue 08-04-25 | 5 | Developers |
| 7 | **Completion and approval of specifications, transition to development** | **0 days** | **$0.00** | **Tue 08-04-25** | **Tue 08-04-25** | **6** | |
| 8 | **Subsystem Development** | **84 days** | **$52,078.00** | **Wed 09-04-25** | **Fri 08-08-25** | | |
| 9 | Supplier Invoice Entry | 21 days | $13,664.00 | Wed 09-04-25 | Mon 12-05-25 | 7 | Developers,Database Administrators, Computers[1],Software Licenses[1],Softwa |
| 10 | Monitoring of Liabilities | 14 days | $9,576.00 | Tue 13-05-25 | Fri 30-05-25 | 9 | Developers,Database Administrators, Computers[1],Software Licenses[1],Softwa |
| 11 | Payment Issuance and Management of Checks | 21 days | $13,664.00 | Mon 02-06-25 | Tue 01-07-25 | 10 | Developers,Database Administrators, Software Licensing, Software Licenses[1],Computers[1] |
| 12 | Printing Capabilities | 14 days | $3,920.00 | Wed 02-07-25 | Mon 21-07-25 | 11 | Developers |
| 13 | Functionality Testing | 14 days | $11,254.00 | Tue 22-07-25 | Fri 08-08-25 | 12 | Testers,Developers,Computers[1], Servers[1] |
| 14 | **Completion of development, transition to test phase** | **0 days** | $0.00 | **Fri 08-08-25** | **Fri 08-08-25** | **13** | |
| 15 | **Testing and Validation** | **35 days** | **$30,010.00** | **Mon 11-08-25** | **Mon 29-09-25** | | |
| 16 | Internal Functional Testing | 14 days | $11,254.00 | Mon 11-08-25 | Fri 29-08-25 | 14 | Testers,Developers,Computers[1], Servers[1] |
| 17 | Compatibility Testing with Subsystems | 14 days | $11,254.00 | Mon 01-09-25 | Thu 18-09-25 | 16 | Testers,Developers,Servers[1], Computers[1] |
| 18 | System Evaluation by Involved Stakeholders | 7 days | $7,502.00 | Fri 19-09-25 | Mon 29-09-25 | 17 | Testers,Developers,Computers[1], Servers[1] |
| 19 | **Final approval and preparation for production** | **0 days** | **$0.00** | **Mon 29-09-25** | **Mon 29-09-25** | **18** | |
| 20 | **Delivery and Training** | **49 days** | **$17,304.00** | **Tue 30-09-25** | **Mon 08-12-25** | | |
| 21 | Subsystem Delivery | 7 days | $4,088.00 | Tue 30-09-25 | Wed 08-10-25 | 19 | Project Manager,Training Coordinators |
| 22 | User Training | 14 days | $3,136.00 | Thu 09-10-25 | Wed 29-10-25 | 21 | Training Coordinators,Staff Training |
| 23 | Initial Technical Support Period | 28 days | $10,080.00 | Thu 30-10-25 | Mon 08-12-25 | 22 | Project Manager,Maintenance & Support |
| 24 | **Completion of the project** | **0 days** | $0.00 | **Mon 08-12-25** | **Mon 08-12-25** | **23** | |

**Figure 2.** Time Programming in MS Project

### 3.3.1 Gantt chart

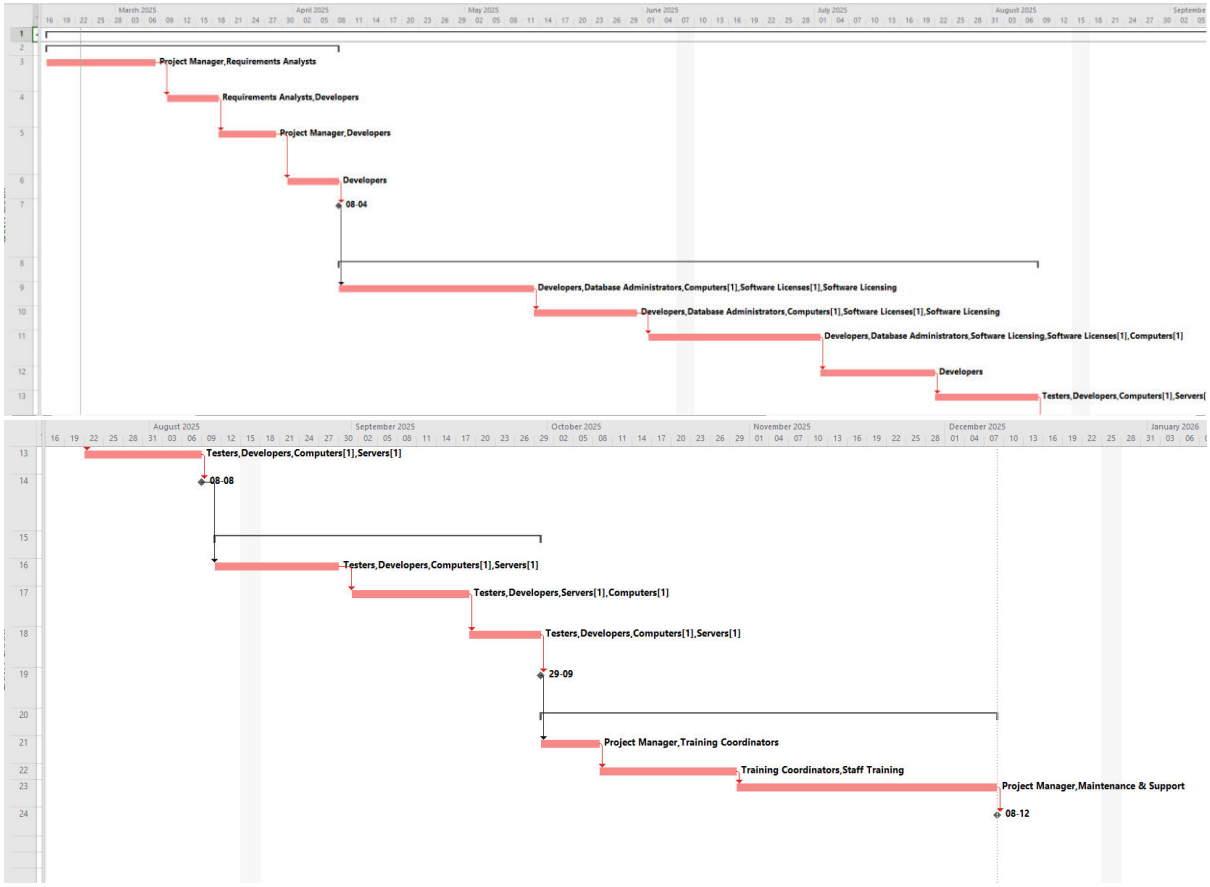


**Figure 3.** Gantt chart in MS Project

Gantt chart created for the project shows:

- The project phases – Project Initiation, Subsystem Development, Testing and Validation, Delivery and Training
- The duration of each task – Its start and completion date, taking into account non-working weekends and holidays.
- The dependencies between activities – They are captured by Finish - to - Start ( FS ) type connections, that is, each task starts after the completion of the previous one.
- Critical activities – They are shown in red on the diagram, indicating that any delay will affect the completion of the project.
- The resources involved – They have been assigned to each task ensuring optimal use of available personnel and materials.

The overall project duration is 203 days, starting on February 17, 2025 and ending on December 8, 2025. The scheduled sequence of activities ensures the timely completion of each phase before the start of the next, minimizing the risks of delays.

## 3.4 Resource planning

Resource planning is a critical element of project management, as it ensures the efficient and timely implementation of activities, in accordance with the available human and material resources. For the "Treasury Management" information system, proper resource management contributes to the optimal utilization of available resources and the minimization of delays.

| | Resource Name | Type | Material | Initials | Group | Max. | Std. Rate | Ovt. | Cost/Use | Accrue | Base |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Project Manager | Work | | P | | 100% | $45.00/hr | $65.00/hr | $0.00 | Prorated | Standard |
| 2 | Requirements Analysts | Work | | R | | 100% | $40.00/hr | $60.00/hr | $0.00 | Prorated | Standard |
| 3 | Developers | Work | | D | | 100% | $35.00/hr | $50.00/hr | $0.00 | Prorated | Standard |
| 4 | Database Administrators | Work | | D | | 100% | $38.00/hr | $55.00/hr | $0.00 | Prorated | Standard |
| 5 | Testers | Work | | T | | 100% | $32.00/hr | $48.00/hr | $0.00 | Prorated | Standard |
| 6 | Training Coordinators | Work | | T | | 100% | $28.00/hr | $42.00/hr | $0.00 | Prorated | Standard |
| 7 | Computers | Material | | C | | | $0.00 | | $950.00 | Start | |
| 8 | Software Licenses | Material | | S | | | $0.00 | | $450.00 | Start | |
| 9 | Servers | Material | | S | | | $0.00 | | $2,800.00 | Start | |
| 10 | Software Licensing | Cost | | S | | | | | | Start | |
| 11 | Staff Training | Cost | | S | | | | | | End | |
| 12 | Maintenance & Support | Cost | | M | | | | | | End | |

**Figure 4.** Resource Scheduling in MS Project

### 3.4.1 Resource Categories

In this project, the resources recorded in Resource Microsoft Sheets Projects include:

1. **Human Resources ( Work ) – These are the personnel involved in the analysis, development, testing and support of the system.**
    - Project Manager – Oversees project progress and manages the schedule
    - Specifications Analysts – Participate in the collection and documentation of requirements
    - Developers – Implement the development of the system
    - Database Administrators – Responsible for managing data
    - Testers – Perform checks and tests on the system
    - Training Managers – They undertake the training of end users
2. **Material resources – These relate to the materials and technological infrastructure required for the implementation of the project.**
    - Computers – Necessary for system development and testing
    - Software Licenses ) – Software licenses required for the development and operation of the system
    - Servers – For hosting and operating the information system

3. **Cost – Includes expenses related to software licenses, training, and technical support**
    - Software Licensing – Cost of Acquiring and Maintaining Licenses
    - Personnel Training – Cost for training end users
    - Maintenance and Support – Cost for initial and ongoing technical support of the system

### 3.4.2 Assigning Resources to Tasks

Resources have been allocated to the respective project tasks, taking into account the skills required and the available costs. Below are indicative assignments:

- Specification Analysis – Specification Analysts, Project Manager
- System Development – Programmers, Database Administrators, Computers, Software
- System Testing – Testers, Computers, Servers
- User Training – Training Managers, Staff Training
- Technical Support – Project Manager , Maintenance and Support

## 3.5 Budget estimate

Budget estimation is a critical process in project management, ensuring that the required resources are available and that the costs obey the financial constraints. In the context of the "Cash Management" project, the costing was done taking into account the estimates of the work, the resources required and the total financing. The Cash Flow diagram was implemented in the MS Project tool .

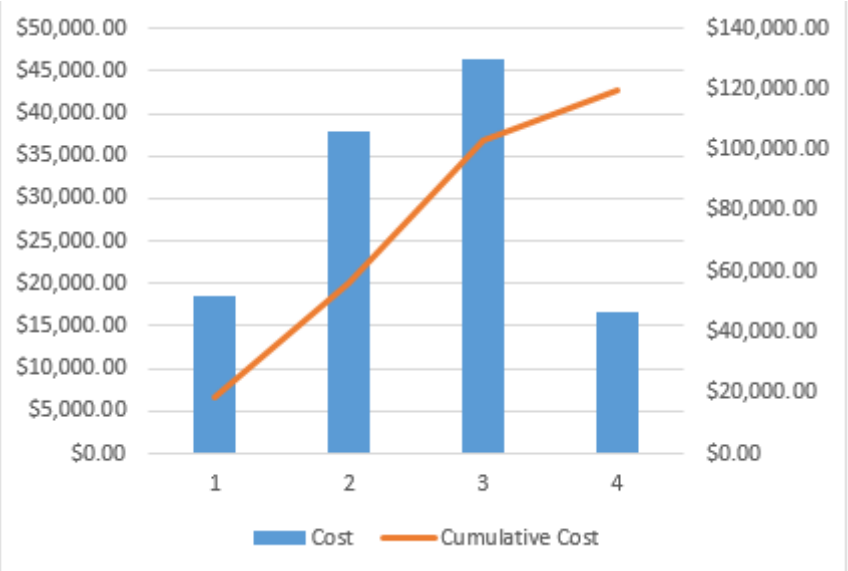

**Figure 5.** Budget Estimation in MS Project

The Cash chart Flow depicts the distribution of costs during the different phases of the project and Cumulative Cost , which shows how the total cost accumulates over time.

The cost estimate was based on:

- Direct Costs – Human resources (salaries), equipment, software, servers
- Indirect Costs – Training, maintenance and support costs
- Phased Cost Allocation – Separation of costs by phase of the project

In the diagram:

- Blue columns – Represent the individual costs of each phase
- Orange line – Shows cumulative cost as the project progresses

The main observations from the diagram are:

- Gradual increase in cost from start to development phase
- The development phase is the most expensive, due to the high needs for developers, equipment, and software.
- The total cost is fixed at delivery, with some additional costs for support and training

# 4. Design of the Cash Management Subsystem

## 4.1 Description of the system aspects

The design of the Cash Management subsystem is based on Zachman Framework , which organizes the system into different dimensions ( View ) and levels of analysis ( Levels ).

**Zachman Framework – Cash Management – Athanasiou Vasileios Evangelos – 19390005 – UNIWA**

| | WHAT<br>Data | HOW<br>Function | WHO<br>People | WHEN<br>Time |
|---|---|---|---|---|
| **Contextual** | Cash transactions, account movements, cash balances, financial flows. | Processing payments, cash flow control, management of collections and payments. | System users, such as cashiers, financial managers, auditors, and administrative personnel. | Account updates are performed in real time or manually, depending on needs. |
| **Conceptual** | Transaction data, payment accounts, income-expense categories, cash balances. | Monitoring of cash flows, report generation, balance sheet printing, and payment scheduling. | Application users, such as cashiers, accountants, and administrative staff. | Cash flow monitoring is performed daily, while reports can be generated daily, weekly, or monthly. |
| **Logical** | Integration of cash management data with other subsystems, such as General Accounting, Budgeting, Procurement, and ERP. | Automated or manual update of cash transactions, data exchange with banks, and transaction verification. | Application users, system administrators, financial controllers, and testers. | Updates and data integration occur at scheduled intervals (e.g., daily, weekly), while historical data storage follows predefined timeframes. |

**Figure 6.** Zachman Framework for the Cash Management System

### 4.1.1 Views : Data , Function , People , Time

The subsystem is analyzed in the following dimensions:

- WHAT ( Data ) – Describes the system data, such as cash entries, payment accounts, cash balances, and financial flows
- HOW ( Function ) – Describes the basic functions, such as payment management, cash flow control, and collection management
- WHO ( People ) – Includes the users of the system, such as cashiers, finance managers, and administrative staff
- WHEN ( Time ) – Specifies the time frame for updating and operating the system, such as daily, weekly or monthly.

### 4.1.2 Levels: Contextual, Conceptual, Logical ( Zachman Framework)

The subsystem is analyzed in three design levels:

- Contextual Level – Focuses on the general description of the system, such as cash registers and basic financial functions.
- Conceptual Level – Analyzes transactions, payment accounts, and financial categories in more detail.
- Logical Level – Examines the system's interface with other applications such as General Accounting and ERP , as well as data flow automation.

## 4.2 Use of appropriate tools ( BPMN , UML )

The development of the Cash Management subsystem is based on the use of modern business process modeling and system architecture tools, such as BPMN and UML . These tools allow for the precise description of functionality, data, workflows and involved users within the Zachman framework. Framework and the Enterprise approach Architecture Planning ( EAP ).

### 4.2.1 ERD & Logical Data Model – Data & Relationships (Data: WHAT)

System data analysis is done with tools such as Entity - Relationship Diagram ( ERD ) and Logical Data Model , which correspond to Zachman 's Data ( WHAT ) column Framework .

Applications in data management:

- Conceptual ERD ( Contextual Level ) – Represents the basic entities such as Invoices, Suppliers, Payments, Financial Categories.

**DATA/Contextual – Cash Management – Athanasiou Vasileios Evangelos – 19390005 – PADA – Conceptual ERD**

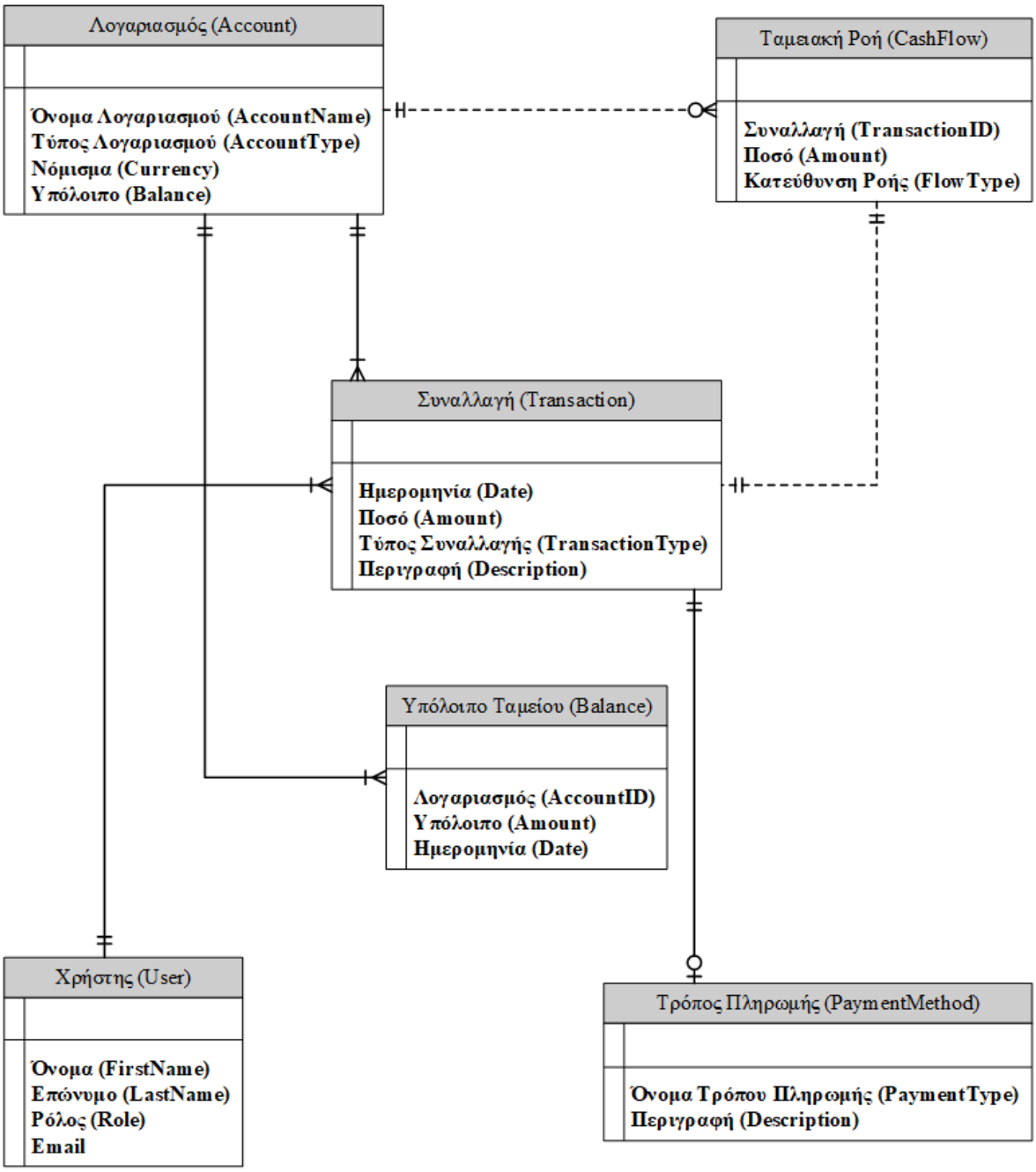


**Figure 7.** Conceptual ERD ( DATA / Contextual ) for the Cash Management System

- Entity - Relationship Diagram ( Conceptual) Level ) – Analyzes relationships between data, e.g. each supplier can have multiple invoices, each invoice can be linked to multiple payments.

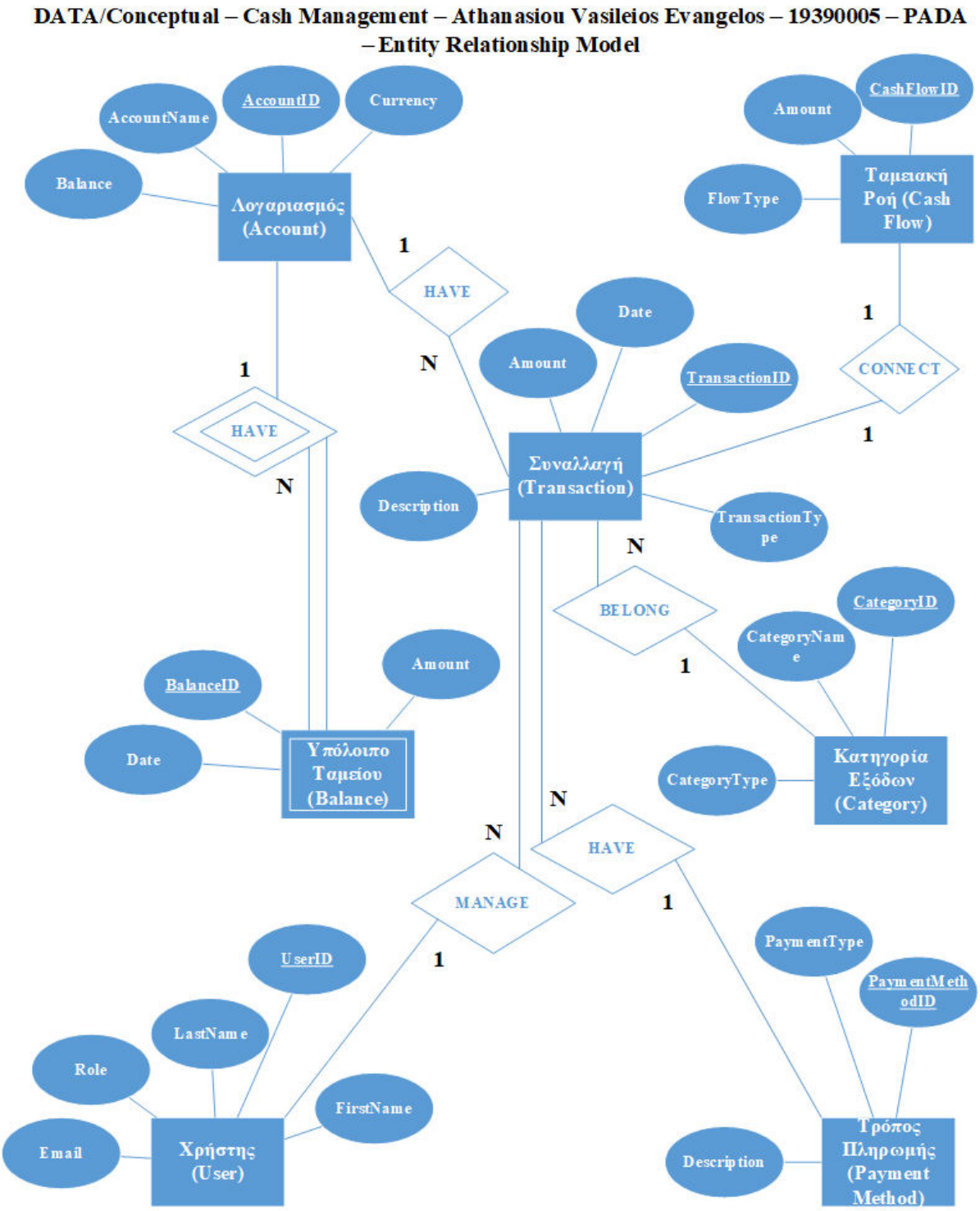


**Figure 8.** Entity-Relationship Diagram (DATA/Conceptual) for the MS Cashier Management

- Logical Data Model ( Logical Level ) – Specifies data types, integrity rules, primary and foreign keys and captures the database.

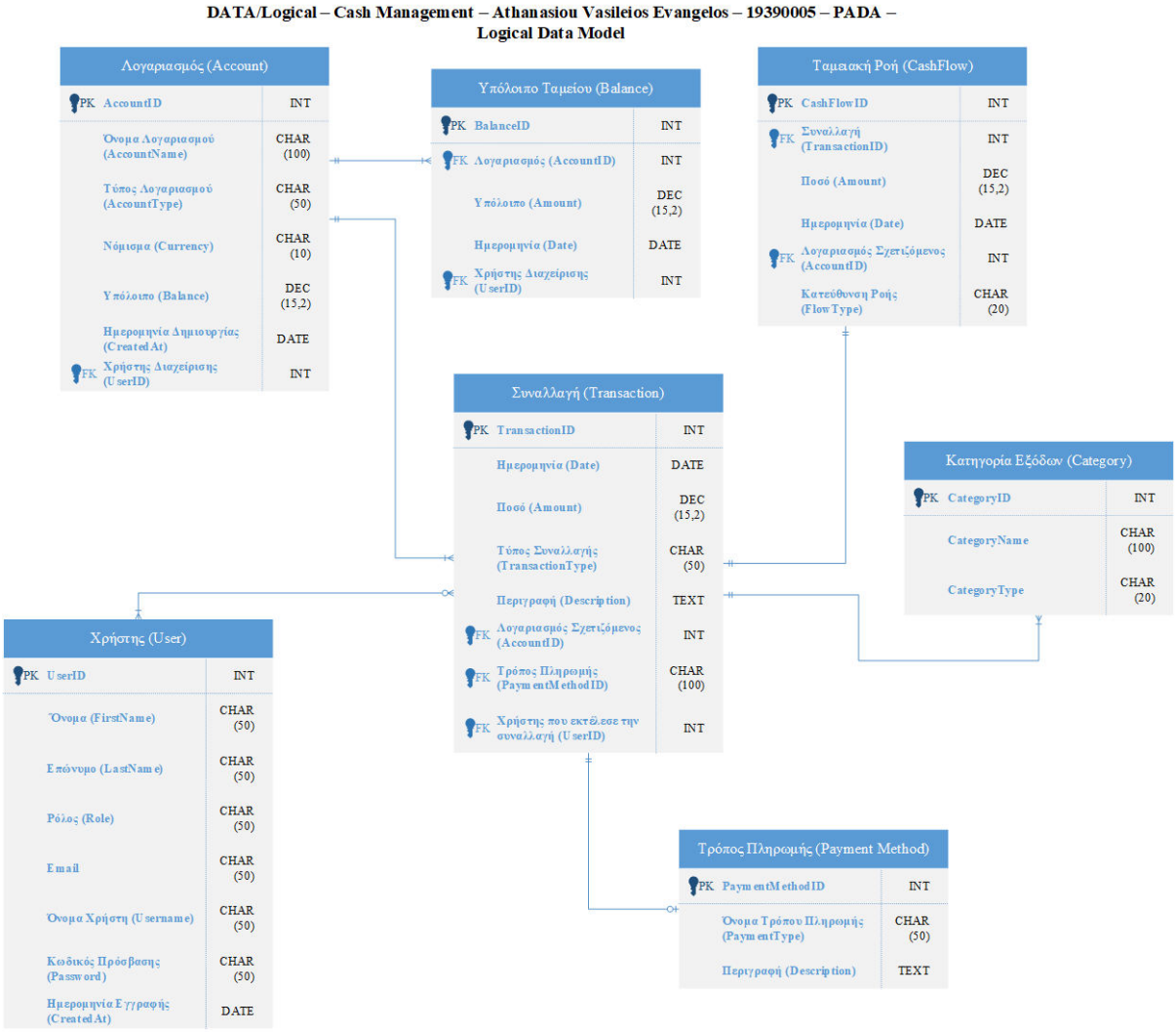


**Figure 9.** Logical Data Model ( DATA / Logical ) for the Cash Management System

### 4.2.2 BPMN – Business Process Modeling ( Function : HOW )

BPMN is used for the graphical representation of the business processes of the Cash Management subsystem. In Zachman 's approach Framework , BPMN falls under the Function ( HOW ) column and supports the modeling of workflows related to payment processes, cash movements, and approvals.

Process modeling applications :

- Process Flowchart ( Contextual) Level ) – Presents the basic operational flows of the system, such as entering invoices, approving payments, and updating General Ledger.

**FUNCTION/Contextual – Cash Management – Athanasiou Vasileios Evangelos – 19390005 – PADA – Process Flowchart**

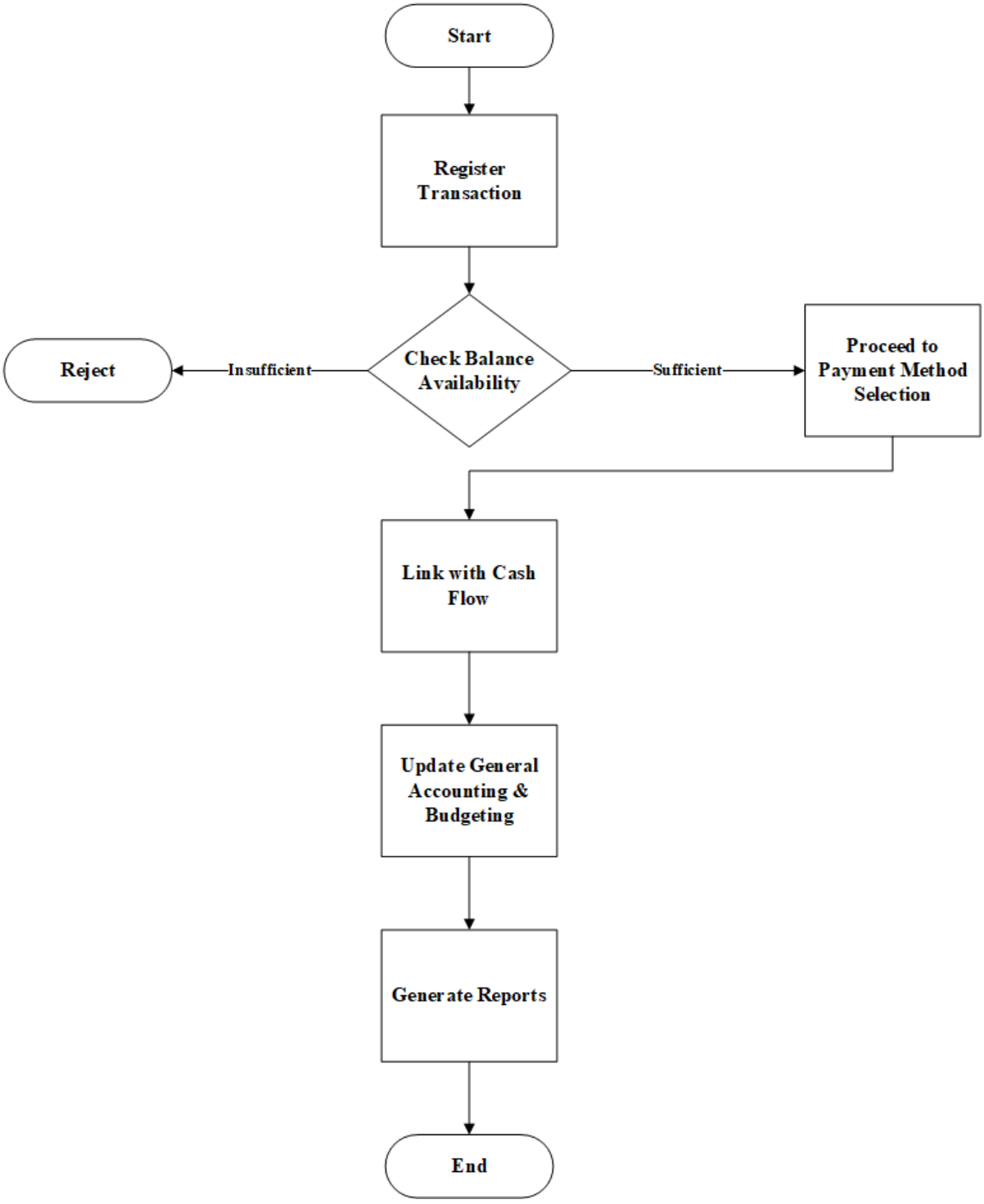


**Figure 10.** Process Flowchart ( FUNCTION / Contextual ) for the Cash Management System

- Workflow Diagram ( Conceptual) Level ) – It specifies the flow of processes, capturing cash flow management step by step.

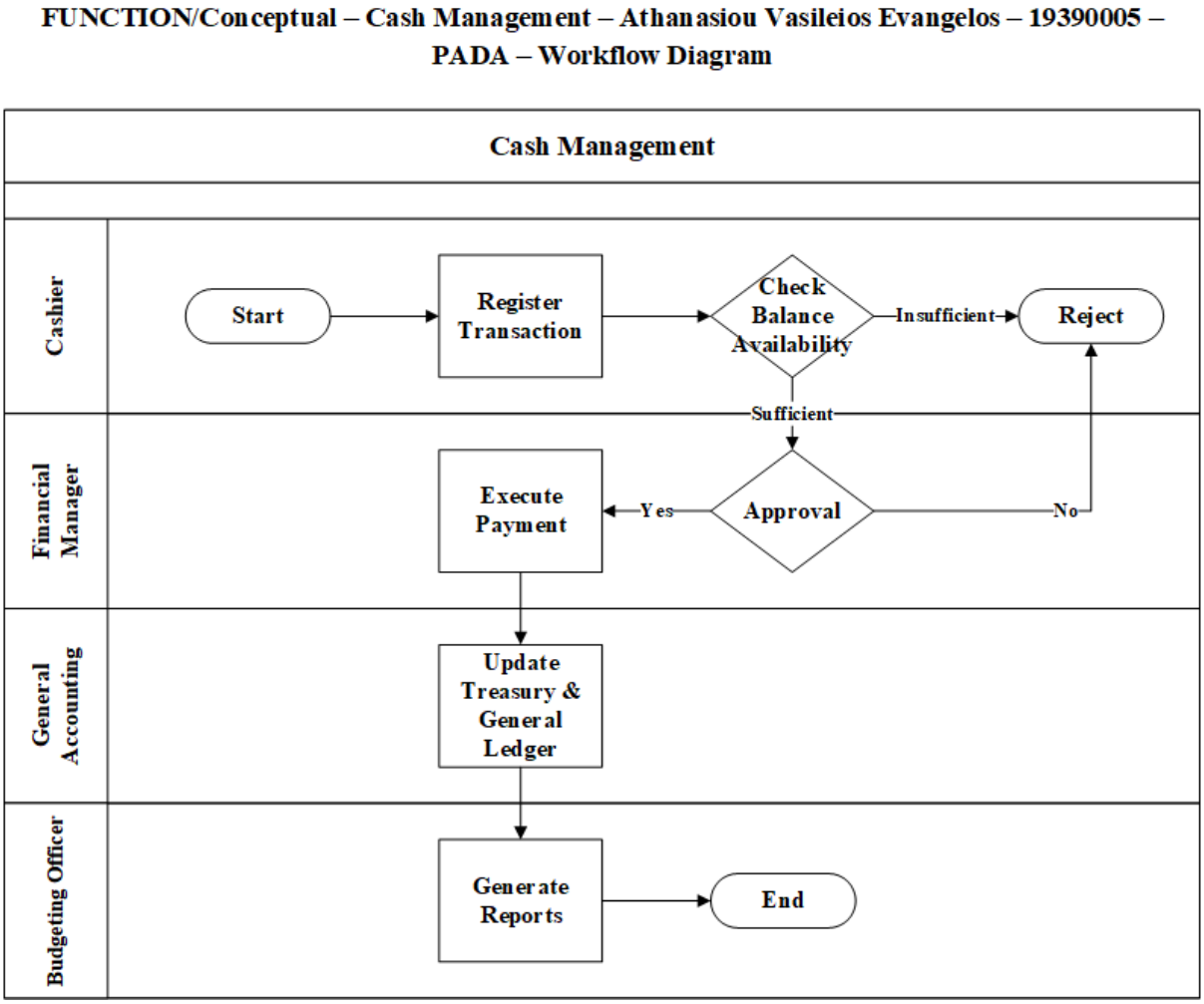


**Figure 11.** Workflow Diagram ( FUNCTION / Conceptual ) for the Cash Management System

- BPMN ( Logical Level ) – Represents the automation and interconnection of the subsystem with other information systems ( ERP , General Accounting, Procurement)

**FUNCTION/Logical – Cash Management – Athanasiou Vasileios Evangelos – 19390005 – PADA – BPMN**

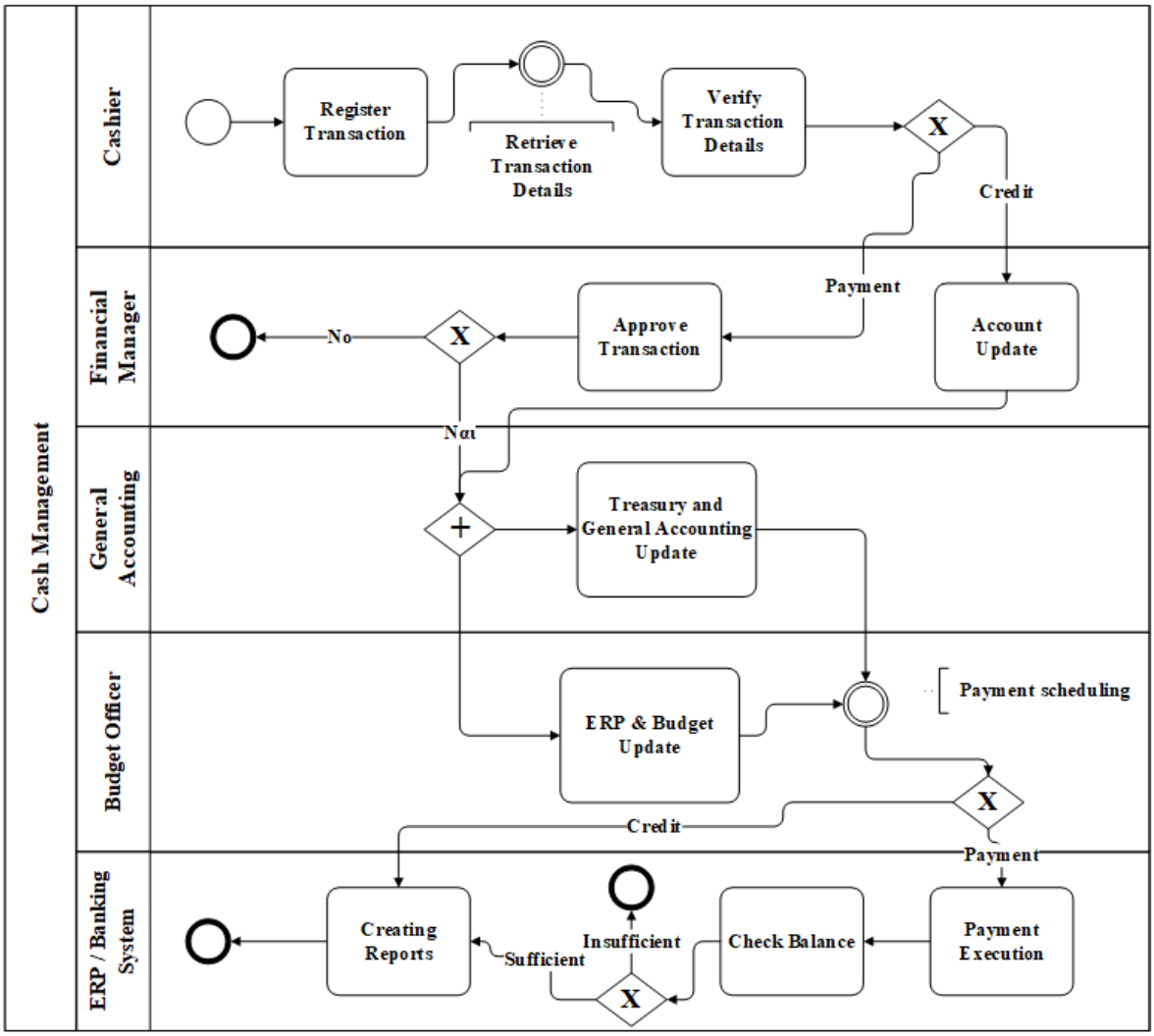


**Figure 11.** BPMN ( FUNCTION / Logical ) for the Cash Management System

### 4.2.3 UML & RACI – Users & Roles (People: WHO)

Zachman 's People ( WHO ) column Framework captures the roles of the system users, their responsibilities and their interactions with the Cash Management subsystem.

Applications in user and role management:

- Organizational Chart ( Contextual) Level ) – Presents the main roles such as Treasurers, Finance Managers, Administrative Staff, Auditors.

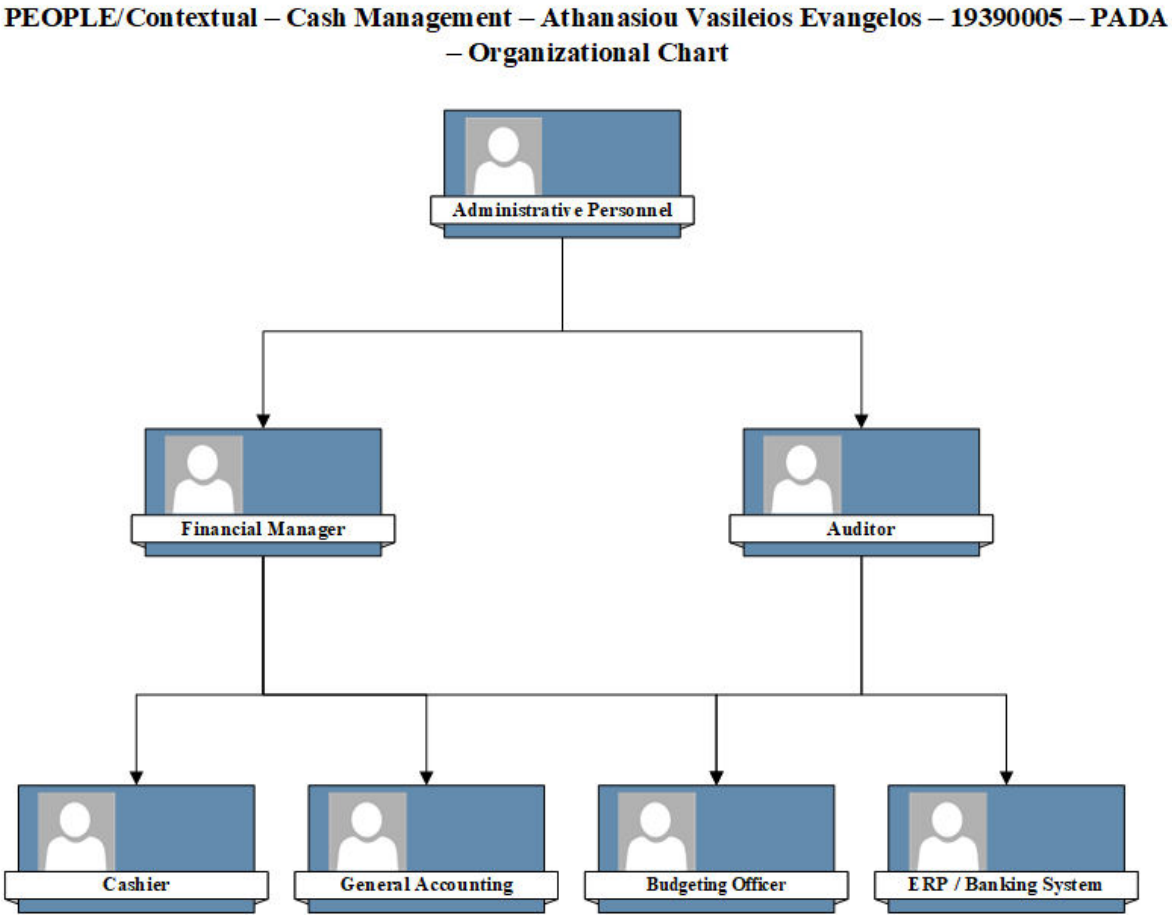


**Figure 12.** Organizational Chart (PEOPLE/Contextual) for the MS Cashier Management

- RACI Matrix (Conceptual Level) – Defines the responsibilities each user in each process , determining who it is Responsible , Accountable , Consulted , Informed

**PEOPLE/Conceptual – Cash Management – Athanasiou Vasileios Evangelos – 19390005 – PADA – RACI Matrix**

| Processes | Cashier | Financial Manager | General Accounting | Budgeting Officer | ERP / Banking System | Auditor |
|---|---|---|---|---|---|---|
| Transaction Entry | R | A | I | I | I | C |
| Balance Check | R | A | I | I | I | C |
| Payment Approval | I | R/A | C | C | I | I |
| General Accounting Update | I | I | R/A | C | I | I |
| ERP & Budgeting Update | I | I | I | R/A | C | I |
| Payment Execution | I | I | I | C | R/A | I |
| Report Generation | I | I | I | R | C | A |
| Inspection & Audit | I | I | I | I | I | R/A |

**Figure 13.** RACI Matrix ( PEOPLE / Conceptual ) for the Financial Management Program

- UML Use Case Diagram ( Logical Level ) – Shows how users interact with the system, e.g. a cashier enters payments, an auditor approves invoices.

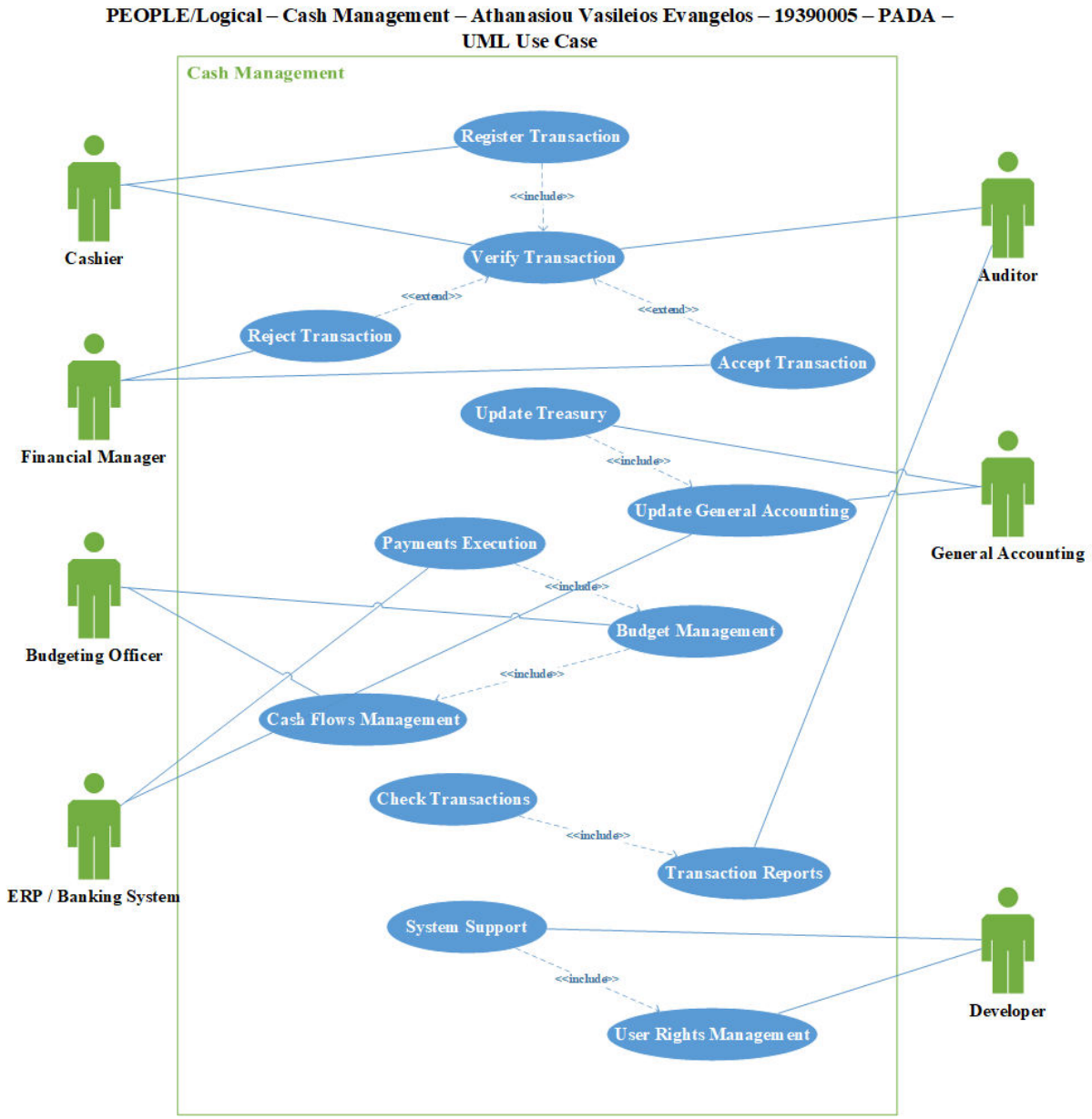


**Figure 14.** UML Use Case ( PEOPLE / Logical ) for the Cash Management Program

### 4.2.4 Scheduling & Time Management ( Time : WHEN )

The time dimension of the Cash Management subsystem is defined in the Time ( WHEN ) column of Zachman Framework . Scheduling of processes is achieved through Roadmap , PERT and Gantt charts .

Applications in time management:

- Roadmap Diagram ( Contextual) Level ) – Records the implementation phases of the subsystem, e.g. requirements analysis, development, testing, installation.

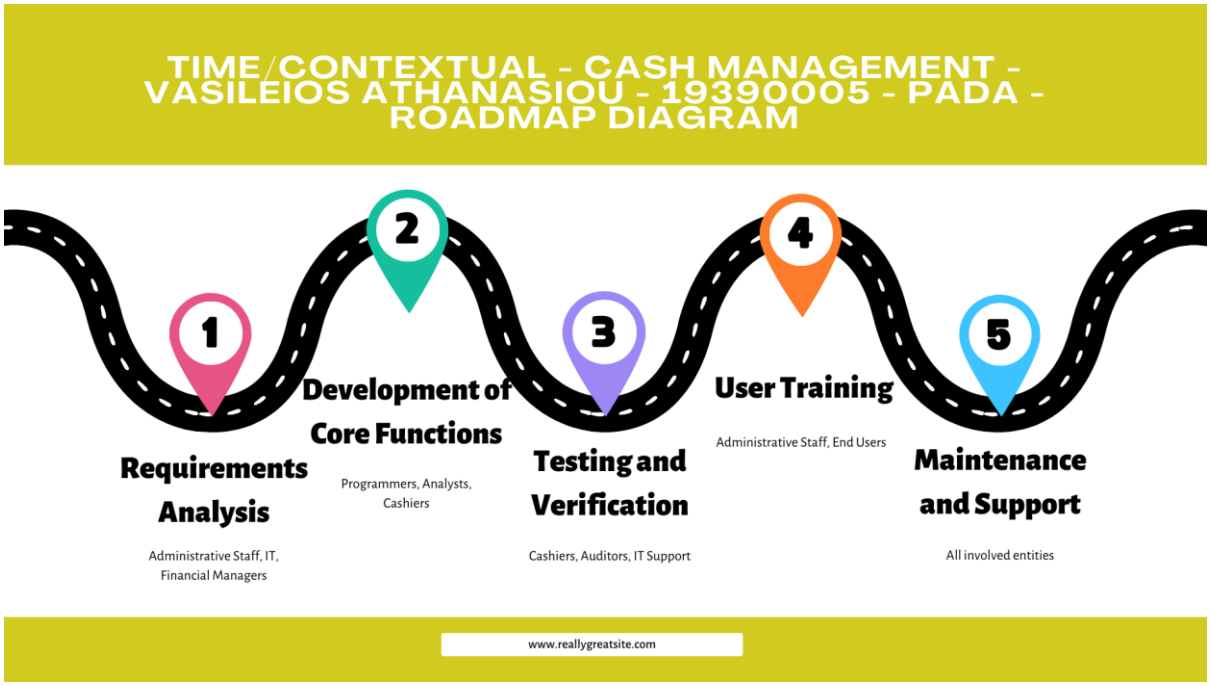


**Figure 15.** Roadmap Diagram ( TIME / Contextual ) for the Cash Management System

- PERT Chart ( Conceptual) Level ) – Used to analyze the task sequence, identifying critical paths and potential points of delay.

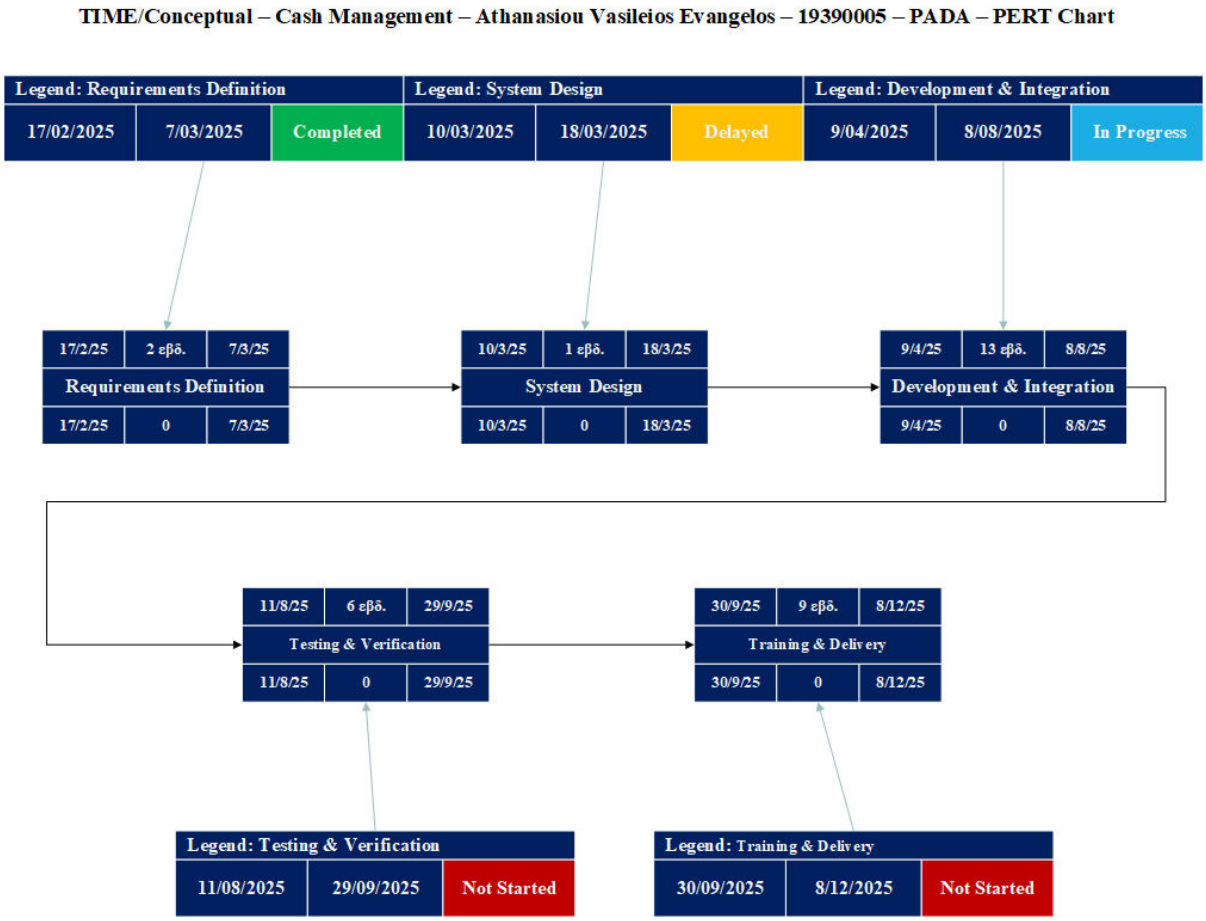


**Figure 15.** PERT ( TIME / Conceptual ) for the Cash Management Project

- Gantt Chart ( Logical Level ) – Captures activity schedules and deadlines, planning the tasks required for the development and implementation of the system.

The Gantt chart Chart is analyzed and illustrated in chapter 3.3.1 Gantt Chart .

### 4.2.5 Completion of Design based on EAP and Zachman Framework

The Enterprise Architecture Planning ( EAP ) offers a structured approach to aligning technology with business needs. In this context:

- Data Architecture is modeled with ER Diagrams , depicting the relationships between the basic entities of the system.
- Application Architecture corresponds to the functional flows of the system, including modeling with BPMN and UML to describe in detail the interaction between users and the subsystem.

## 5. Conclusion

The development and implementation of the Cash Management Subsystem is an important step for the automated and efficient management of financial transactions.

Using Zachman Framework and modern modeling techniques ( BPMN , UML , ERD , RACI , PERT , Gantt ), a structured and flexible system was created that offers accuracy in cash flows, automation of transactions and payments, better control of suppliers and budgets, and security in financial transactions.

Future improvements and continuous monitoring will ensure that the system continues to adapt to the needs of the Health Unit, enhancing administrative and financial efficiency.

# INFORMATION SYSTEMS DESIGN AND DEVELOPMENT


Thank you for your attention.