MOBILE GARAGE LARNACA

Software Metrics Document

Version 1

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1. PROCESS METRICS

1.1 Development Effort (per phase)

Phase	Estimated Effort (person-days)	Actual Effort (person-days)
Requirements Analysis	6	9
Specification	5	8
Design	6	9
Implementation and Integration	40	45
Testing	6	9

1.2 Development Duration (per phase)

Phase	Estimated Duration (calendar-days)	Actual Duration (calendar-days)
Requirements Analysis	7	10
Specification	7	10
Design	7	10
Implementation and Integration	42	47
Testing	7	10

1.3 Slippage

Phase	Effort Slippage (person-days)	Duration Slippage (calendar-days)
Requirements Analysis	3	3
Specification	3	3
Design	3	3
Implementation and Integration	5	5
Testing	3	3

1.4 Number of Changes

1.4.1 Requirements Change

Number of changes: 0

No adjustments were made to the initial requirements throughout the development process.

1.4.2 Fault Corrections

- When clicking the logo, it should take you to the dashboard.
- When I add a customer, it doesn't let me add a car.
- The "Sort by" in Parts reloads the page when changed
- In Parts, when you click on a part and scroll down, and then click "View the invoice" (if it exists for that part), the modal that opens doesn't allow you to click the close button or the "X" in the top-right corner.
- In the same modal, the Edit and Delete buttons do not work.
- The "Sort by" in Job Cards is not working .
- The "Print" button on the main Job Card screen has an issue.
- When I add a Job Card, the "Brand" field doesn't show up.
- When I add a Job Card, the calculations do not appear in Total Cost and Total Parts.
- In the Accounting section, when I click to go to Customers, it doesn't open.
- In Accounting > Job Card Details, when I click on a job card, it doesn't let me edit it.
- In Accounting > Part Detail, when I click on a part, it doesn't open.
- In the Invoice section, when I change the "Sort by," the page refreshes
- When I click on an invoice, there is a problem with the database.
- When I open an invoice and add a part, I can't delete that part afterward.
- The "Delete Invoice" function doesn't work

1.4.3 Exogenous Factors

No external factors, whether legislation, business goals or processes influenced the system in any way.

2. PERSON METRICS

2.1 Staff Profile

2.1.1 Number of People Involved

Development Phase	Number of People
Requirements Analysis	6
Requirements Specifications	6
System Design	6
Implementation and Integration	6
Testing	6

2.1.2 Experience and Knowledge

Experience and Knowledge	Very Low	Low	Average	High	Very High
Antonis Andreou		X			
Gabriel Vasile		X			
Georgios Architektonidis		X			
Jorgos Xidias		X			
Kyriacos Andreou		X			
Stylianos Kyprianou		X			

2.1.3 Skills (per phase)

Skills Requirements Analysis	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Skills Requirements Specifications	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Skills System Design	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Skills Implementation and Integration	Very Low	Low	Average	High	Very High
Antonis Andreou		X			
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Skills Testing	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile		X			
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

2.1.4 Leadership

Leadership Requirements Analysis	Very Low	Low	Average	High	Very High
Antonis Andreou		X			
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Leadership Requirements Specifications	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Leadership System Design	Very Low	Low	Average	High	Very High
Antonis Andreou			X		
Gabriel Vasile			X		
Georgios Architektonidis			X		
Jorgos Xidias			X		
Kyriacos Andreou			X		
Stylianos Kyprianou			X		

Leadership Implementation and Integration	Very Low	Low	Average	High	Very High
Antonis Andreou		X			
Gabriel Vasile			X		
Georgios Architektonidis		X			
Jorgos Xidias		X			
Kyriacos Andreou		X			
Stylianos Kyprianou			X		

Leadership Testing	Very Low	Low	Average	High	Very High
Antonis Andreou		X			
Gabriel Vasile			X		
Georgios Architektonidis		X			
Jorgos Xidias			X		
Kyriacos Andreou		X			
Stylianos Kyprianou			X		

2.1.5 Team Cohesion (per phase)

Team Cohesion	Very Low	Low	Average	High	Very High
Requirements Analysis			X		
Requirements Specifications			X		
System Design			X		
Implementation and Integration		X			
Testing		X			

3. PRODUCT METRICS

3.1 System Attributes

3.1.1 Development Platform

Each member of the team worked on their own personal computer, all of which were equipped with Windows 10.

3.1.2 Programming Language Type(s)

The software was developed using third-generation programming languages (3GL), which are high-level languages commonly used in modern application development.

3.1.3 Primary Programming Language

The system was developed using PHP as the primary programming language.

3.1.4 Business Area Domain

This system is classified within the automotive industry sector.

3.1.5 Application Type

The system offers features for managing the inventory of car parts, jobs and invoices, making it best described as an inventory and management system.

3.1.6 System Type

The software developed is a web application.

3.1.7 Case Tool Maturity

Case Tool Maturity	Very Low	Low	Average	High	Very High
Visual Studio Code			X		
phpMyAdmin			X		

3.1.8 Case Tool Usage

3.1.8.1 Visual Studio Code

Case Tool 1	Very Low	Low	Average	High	Very High
Requirements Analysis	X				
Requirements Specifications	X				
System Design	X				
Implementation and Integration					X
Testing					X

3.1.8.2 phpMyAdmin

Case Tool 1	Very Low	Low	Average	High	Very High
Requirements Analysis	X				
Requirements Specifications	X				
System Design	X				
Implementation and Integration					X
Testing					X

3.2 System Size and Structure

3.2.1 Function Points

Function Type	Functional Complexity Count (a)		Complexity Multiplier (b)	Complexity Totals (a×b)
External Inputs (EI)	# Low	2	×3	6
	# Average	4	×4	16
	# High	2	×6	12
	EI Function Type Total			34
External Outputs (EO)	# Low	9	×4	36
	# Average	13	×5	65
	# High	8	×6	48
	EO Function Type Total			149
External Inquiries (EQ)	# Low	0	×3	0
	# Average	7	×4	28
	# High	1	×6	6
	EQ Function Type Total			34
Internal Logical Files (ILF)	# Low	2	×5	10
	# Average	2	×7	14
	# High	3	×10	30
	ILF Function Type Total			54
External Interface Files (EIF)	# Low	0	×7	0
	# Average	0	×10	0
	# High	0	×15	0
	EIF Function Type Total			0
Total Unadjusted Function Point (UFP) Count				271

General Characteristics	Description	Rating (0 to 5)
Data communications	How many communication facilities are there to aid in the transfer or exchange of information with the application or system?	3
Distributed data/processing	How are distributed data and processing functions handled?	2
Performance objectives	Is response time or throughput performance critical?	4
Heavily used configuration	How heavily used is the current hardware platform where the application will be executed?	3
Transaction rate	Is the transaction rate high?	3
Online data entry	What percentage of the information is entered online?	5
End-user efficiency	Is the application designed for end-user efficiency?	4
Online update	How many data files are updated online?	5
Complex processing	Is the internal processing complex?	3
Reusability	Is the application designed and developed to be reusable?	4
Conversion/installation ease	Are automated conversion and installation included in the system?	0
Operational ease	How automated are operations such as backup, startup, and recovery?	4
Multiple site use	Is the application specifically designed, developed, and supported to be installed at multiple sites with multiple organizations?	0
Facilitate change	Is the application specifically designed, developed, and supported to facilitate change and ease of use by the user?	5
Sum of Ratings (min = 0; max = 70)		45

$$Value\ Adjusted\ Factor\ (VAF) = 0.65 + (0.01 \times Sum\ of\ Ratings) = \ 0.65 + (0.01 * 45)$$
$$= 1.1$$

$$Adjusted\ Function\ Points\ (AFP) = UFP \times VAF = 271 * 1.1 = 298.1$$

3.2.2 Object Points

Object Type	Object Complexity Count (a)		Complexity Multiplier (b)	Complexity Totals (a×b)
Screens	# Simple	5	×1	5
	# Medium	16	×2	32
	# Difficult	4	×3	12
	Screens Object Type Total			49
Reports	# Simple	6	×2	12
	# Medium	3	×5	15
	# Difficult	1	×8	8
	Reports Object Type Total			35
3GL+ Components	# Simple	2	×10	20
	# Medium	3	×10	30
	# Difficult	2	×10	20
	3GL+ Components Type Total			70
Total Unadjusted Object Point (UOP) Count				154

$$Number\ of\ Object\ Points\ (NOP) = UOP \times \frac{(100-r)}{100} = 154 * \frac{(100-20)}{100} = 123.2$$

where r is the percentage of components reused.

Developer Experience and CASE Maturity	Very Low	Low	Nominal	High	Very High
PROD	4	7	13	25	50

$$Total\ Effort\ (E) = NOP \times PROD = 123.2 * 13 = 1601.6$$

3.2.3 Lines of Code

Statistic	Value	Percentage
Number of source code lines	114 227	90.16%
Number of blank lines	3 937	3.11%
Number of comment lines	8 529	6.73%
Number of mixed lines (code and comments)	-	-

3.2.4 Modules or Classes

Complexity	Low	Average	High	Total
Number of Classes	**2**	**6**	**6**	**14**

3.2.5 E-R Entities.

Complexity	Low	Average	High	Total
Number of Entities	**4**	**5**	**4**	**13**

3.2.6 Database Tables

Complexity	Low	Average	High	Total
Number of Tables	**9**	**4**	**6**	**19**

3.2.7 Functions or Methods

Complexity	Very Low	Low	Average	High	Total
Number of Functions/Methods	**133**	**169**	**112**	**57**	**471**

3.2.8 Input Screens

Complexity	Low	Average	High	Total
Number of Input Screens	4	14	6	24

3.2.9 Queries

Complexity	Low	Average	High	Total
Number of Queries	63	54	13	130

3.2.10 Reports

Complexity	Low	Average	High	Total
Number of Reports	4	6	1	11

3.2.11 Document Pages (per phase)

Development Phase	Number of Pages
Requirements Analysis	64
Requirements Specifications	231
System Design	121
Implementation and Integration	20

3.3 Constraints

3.3.1 Required Software Quality

End-user didn't request any specific quality measure to be implemented.

3.3.2 Interconnection with Existing Systems

There are no any existing systems to be interconnected.