

GRASPINNO

Transnational model, strategies and decision support for innovative clusters and business networks towards green growth, focusing on green e-procurement in EE/RES for energy refurbishment of public buildings.

Deliverable: 3.10.1 Technical Evaluation Report

Prepared by UPatras,

with the contribution of ATLANTIS Consulting and Terre di Siena Lab (TSL)

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1. INTRODUCTION

1.1 Scope of this deliverable

This report represents the "Technical Evaluation Report" of GRASPINNO unified platform", the Deliverable 3.10.1 for the GRASPINNO project and describes part of the work undertaken in WP3 "Testing". The Report is also part of the Activity 3.10 "Evaluation of the Pilots", which aims to evaluate all the steps of GRASPINNO pilots, including the technical evaluation of the platform, the users' evaluation of the platform, the improvements of the platform, the evaluation of the tender winner with the use of the LCC tool and the evaluation of the pilot site after the refurbishment of the public buildings. This report concerns the 1st step of the evaluation and consists the technical evaluation report, which has been developed by GRASPINNO technical team.

Thus, the main scope of this report is the evaluation of GRASPINNO unified platform using a set of technical performance indicators that are focused on measuring effectiveness and productivity. For the optimization of the evaluating procedure, GRASPINNO unified platform is tested in all the individual tools (Databases, eGPP tool and LCC tool).

1.2 Structure of the deliverable

This deliverable is structured in 5 chapters:

Chapter 2, "GRASPINNO DataBases Technical Indicators", provides a brief description of the evaluation procedures conducted by the GRASPINNO Technical Team and the respective results, regarding the platform's databases. Moreover, there is a description of the conclusions, which arised through the use of the technical indicators. The chapter 2, includes also the diagrams which shows the comparison between the acceptable values of the technical indicators, with the measured values, which derived from the tests on the functions. Finally, Chapter 2 contains the tables which summarises the success or failure of the technical indicators' limits.

The Chapter 3, “GRASPINNO eGPP Tool Technical Indicators”, provides the description of the evaluation procedures with the use of technical indicators, for GRASPINNO eGPP Tool. Moreover, this chapter includes the evaluation results and the conclusions after measuring the Technical Indicators for the eGPP Tool.

In Chapter 4, “GRASPINNO eGPP Tool’s Simple Confirm Indicators”, the evaluation with the use of Simple Confirm Indicators, are provided. This session shows the success or failure of all the individual functionalities of GRASPINNO eGPP Tool.

Chapter 5, “GRASPINNO LCC Tool Technical Evaluation”, provides the description of the evaluation of the LCC tool, which is part of GRASPINNO Unified Platform. Moreover, this chapter includes the Technical Performance Indicators (TPIs) within a table which introduces the three levels of efficiency.

2. GRASPINNO DATABASES TECHNICAL INDICATORS

2.1 Brief Description

The technical evaluation results for GRASPINNO Databases, with the use of Technical Performance Indicators, are included in the Chapter 2. The outcomes derived from the testing of the platform, both for the technical and the functionality parameters of the Databases.

The technical evaluation of the system is mainly based on: a) the reliability of the system’s operations, and b) the time response of the system for certain user requests. The technical evaluation was initially made with the use of “Technical Indicators’ for the technical parameters in accordance with the set acceptable values.

The evaluating procedure includes the following individual steps:

- Identification of the Technical Indicators.
- Identification of the acceptable values of the Technical Indicators.
- Measurement of the Technical indicators, following the proper tests and the record of the final results.

- Evaluation of the Results.

2.2 Evaluation of the Databases with the use of Technical Indicators

The evaluation with the use of technical indicators GRASPINNO Databases is based on the indicators, which represent all the functions of the databases. The indicators have been shared to the two different types of users of the Database. More specifically, the Public Authorities (PAs) and the Small and Medium Enterprises (SMEs) have access to different functions of the databases, thus the indicators were adapted to those categories of users.

Thus, the technical indicators for the PAs are focused on the: registration procedure, search products function, list of products function, time needed for the product list results, view product function and time needed for this function, compare of products and time needed for this function, best practices and time needed for implementing this function. All the indicators are measured within rate and time limits. Finally, the acceptable values of the time limits, derived from the users' tolerance when developing a task on a tool and the acceptable success rates of the individual tasks are quite high, in order to ensure the proper functionality of GRASPINNO Databases.

Table 1: Databases Technical Indicators for PAs Functionalities

Technical Indicator	Acceptable Value
TI-1: Success rate (%) for user identification (Login)	95%
TI-2: Search success rate (%) in the "Search Products" section, by using key-words	95%
TI-3: Time needed for the display of TI2 search results	5 sec
TI-4: Success rate (%) in the "List of Products" section.	95%

Technical Indicator	Acceptable Value
TI-5: Time needed for the display of TI4 list results	5 sec
TI-6: Success rate (%) in the "View of a Product" section.	95%
TI-7: Time needed for the display of TI6 view of product	5 sec
TI-8: Success rate (%) in the "Compare of Products" section.	95%
TI-9: Time needed for the display of TI8 list results	5 sec
TI-10: Success rate (%) in the "Best Practices" section.	95%
TI-11: Time needed for the display of TI8 list results	5 sec

Whilst, the technical indicators for the SMEs are focused on the: registration procedure, add key element function, list of products function, view a product function, edit/update product function, add service function, search products function, search key elements function and search tenders function. Moreover, all the abovementioned functions have their own indicators for the time needed for completing them. Finally, the acceptable values of the time limits, derived from the users' tolerance when developing a task on a tool and the acceptable success rates of the individual tasks are quite high, in order to ensure the proper functionality of GRASPINNO Databases.

Table 2: Databases Technical Indicators for SMEs Functionalities

Technical Indicator	Acceptable Value
TI-1: Success rate (%) for user identification (Login)	95%
TI-2: Success rate (%) in the "Add Key element" section	95%
TI-3: Time needed for add key element of TI2	5 sec
TI-4: Success rate (%) in the "List of Products" section.	95%
TI-5: Time needed for the display of TI4 list results	5 sec
TI-6: Success rate (%) in the "View of a Product" section.	95%
TI-7: Time needed for the display of TI6 view of the product	5 sec
TI-8: Success rate (%) in the "Edit/Update Product" section.	95%
TI-9: Time needed of TI8 Edit/Update product	15 sec
TI-10: Success rate (%) in the "add service" section.	95%
TI-11: Time needed of TI10 add service.	10 sec
TI-12: Success rate (%) in the "add product" section.	95%

Technical Indicator	Acceptable Value
TI-13: Time needed of TI12 add product.	15 sec
TI-14: Search success rate (%) in the "Search Products" section, by using key-words	95%
TI-15: Time needed for the display of TI4 search results	5 sec
TI-16: Search success rate (%) in the "Search Key elements" section, by using key-words	95%
TI-17: Time needed for the display of TI6 search results	5 sec
TI-18: Search success rate (%) in the "Search Tenders" section, by using key-words	95%
TI-19: Time needed for the display of TI8 search results	5 sec

2.3 Evaluation Results

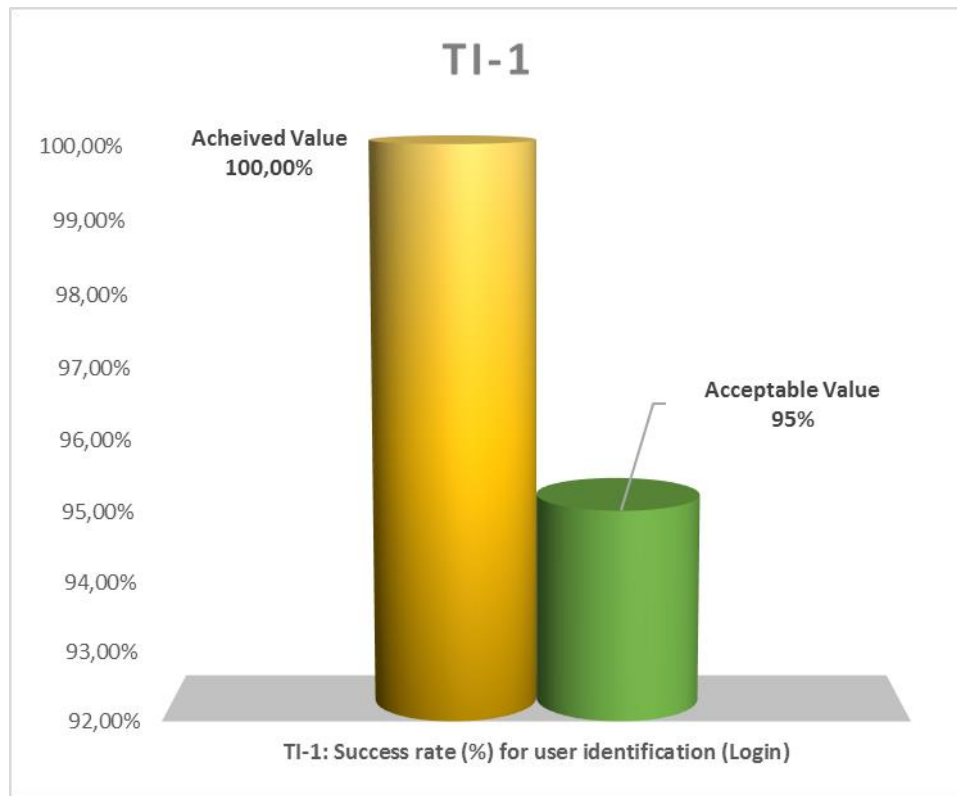
The evaluation procedure of the Graspino databases was performed with the method of technical testing and the certification of the proper functioning of the system's software, by performing iterative user trials. The achieved value for each indicator that was calculated as the average value of the sum of results of the iterative user trials for each specific indicator is presented in the table 3 and table 4.

2.3.1 Evaluation Results for PAs functions

Table 3: Databases Evaluation Results of Technical Indicators for PAs Functionalities

Technical Indicator	Acceptable Value	Achieved Value (after evaluation)
TI-1: Success rate (%) for user identification (Login)	95%	100,00%
TI-2: Search success rate (%) in the "Search Products" section, by using key-words	95%	100,00%
TI-3: Time needed for the display of TI2 search results	5 sec	0.4 sec
TI-4: Success rate (%) in the "List of Products" section.	95%	100,00%
TI-5: Time needed for the display of TI4 list results	5 sec	0.74 sec
TI-6: Success rate (%) in the "View of a Product" section.	95%	100,00%
TI-7: Time needed for the display of TI6 view of product	5 sec	0,32 sec
TI-8: Success rate (%) in the "Compare of Products" section.	95%	100,00%
TI-9: Time needed for the display of TI8 list results	5 sec	0,8 sec
TI-10: Success rate (%) in the "Best Practices" section.	95%	100,00%
TI-11: Time needed for the display of TI8 list results	5 sec	0,96 sec

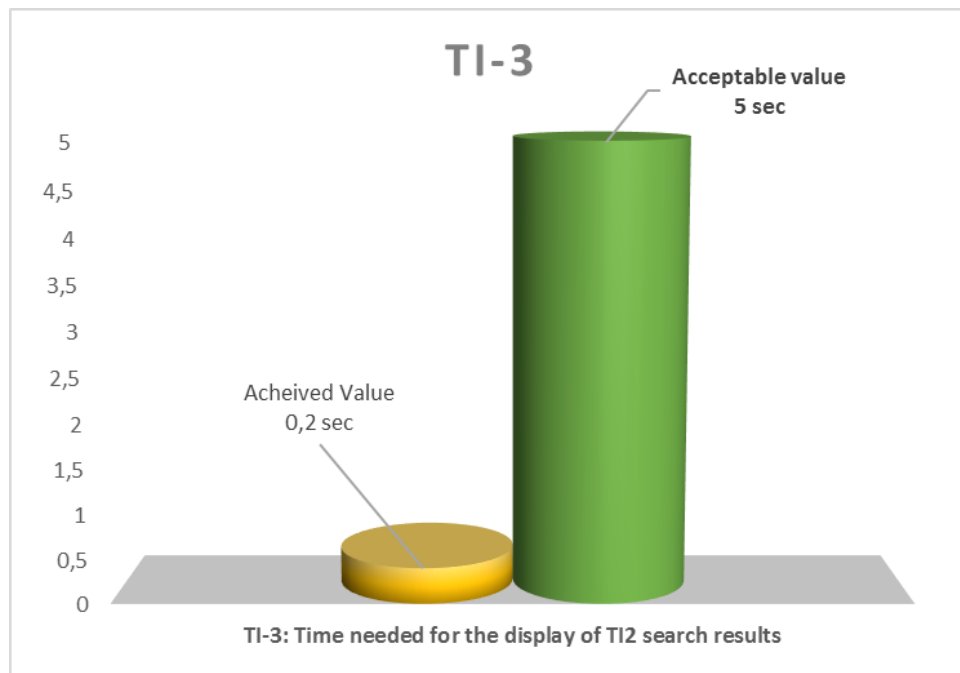
The following diagrams provide a graphic representation of the evaluation results that correspond to each technical indicator used during the technical evaluation procedure, for PAs functions. The diagrams show all the results, comparing with the acceptable values of the technical indicators.



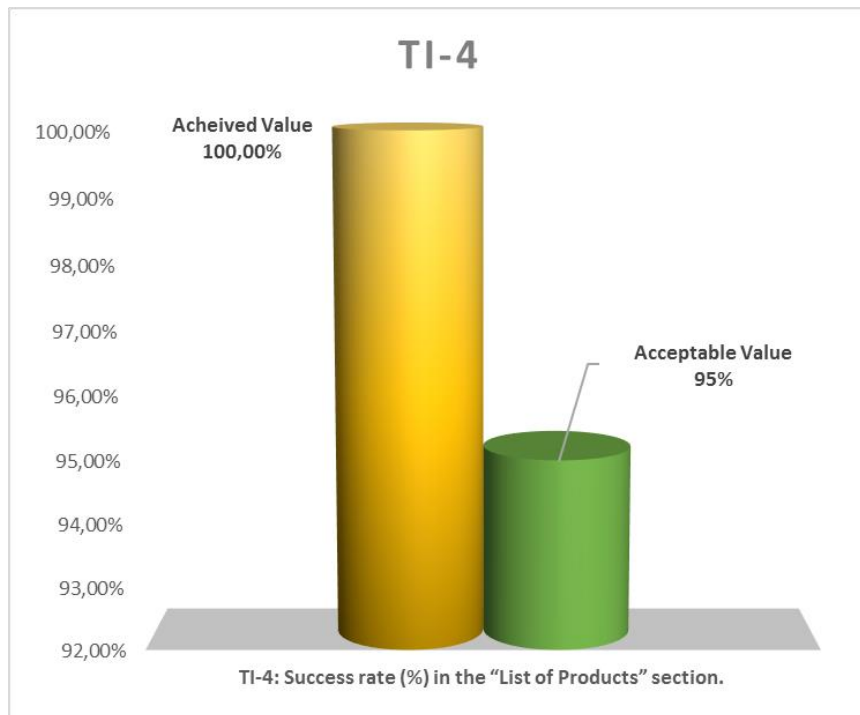
The success rate for the users' identification (login), has been measured with a full success, since it concentrates the rate 100%. Thus, all the tests for the login function have been successfully completed.



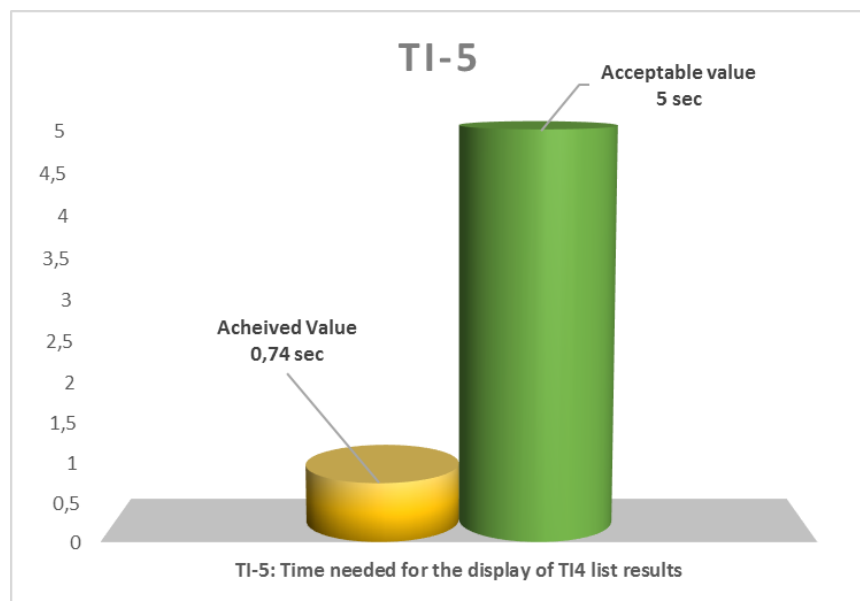
The 2nd indicators shows the results of the search success rate. Through the observation of the previous diagram, we can conclude that all the tests for searching a product, were successfully passed the acceptable value.



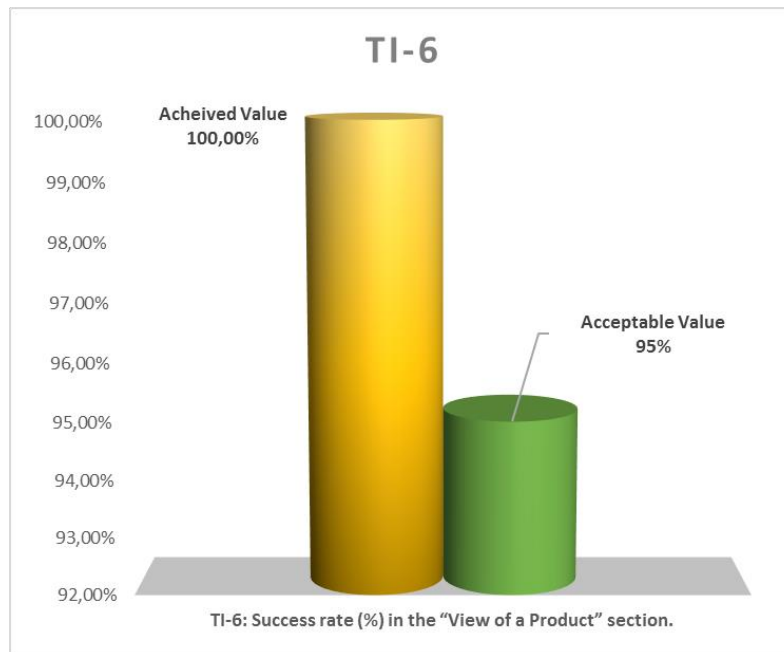
Moreover, the time needed for searching a product, was estimated to 0.2 sec. The technical team evaluates this result as a successful, comparing with the acceptable value, which has benn estimated to 5 sec, according to the standards of the user tolerance when preparing a task in a platform.



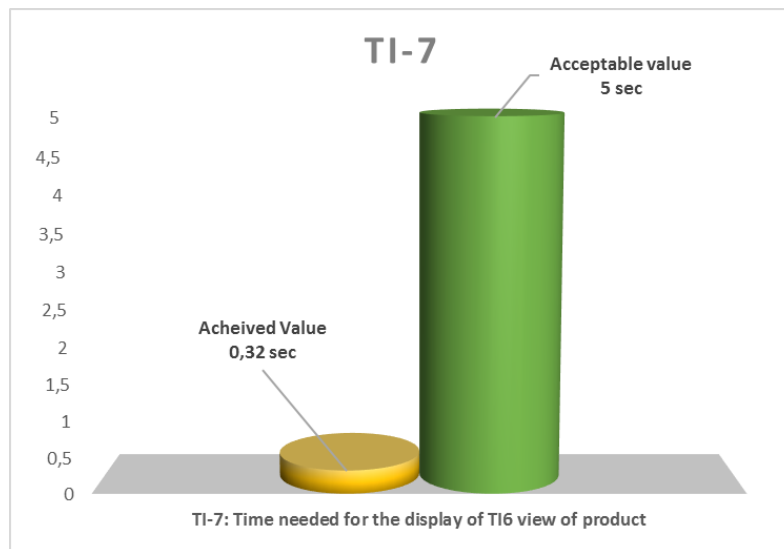
We can also observe that the whole tests on the lists of products, were successfully implemented (100%).



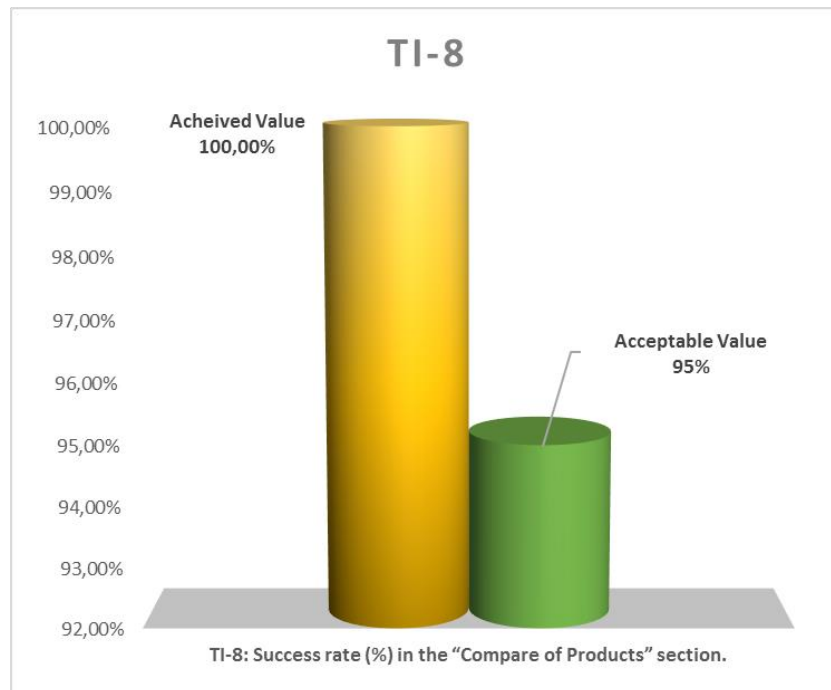
Moreover, the time needed for the results of the list of products, was estimated to 0.74 sec.



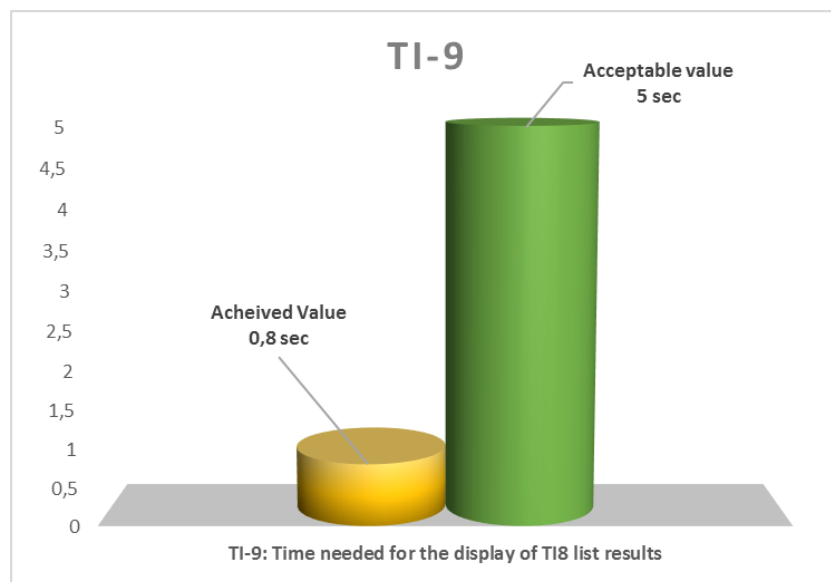
The success rate for the "view of a product" function, was estimated to 100%, since no failure were observed during the tests.



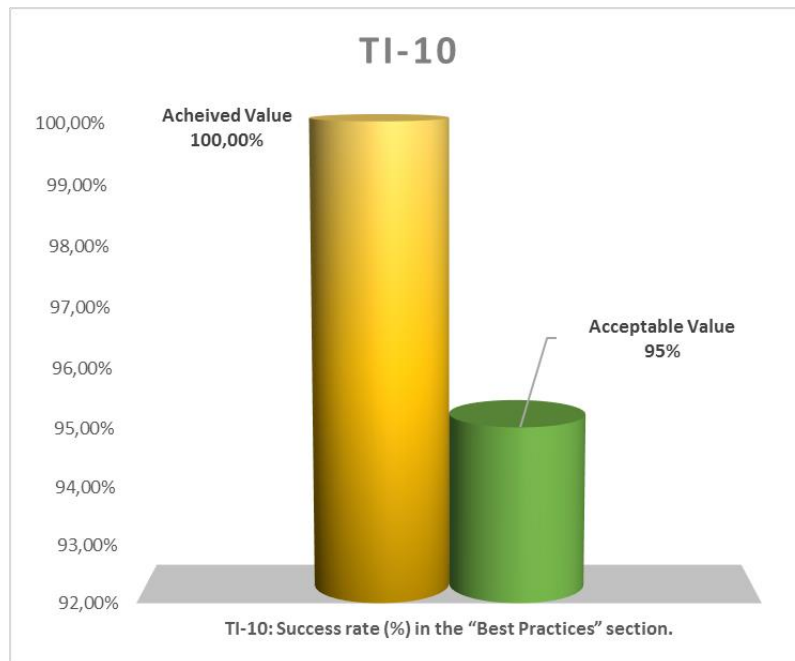
Moreover, the time needed for the results of the view of a product, was estimated to 0.32 sec.



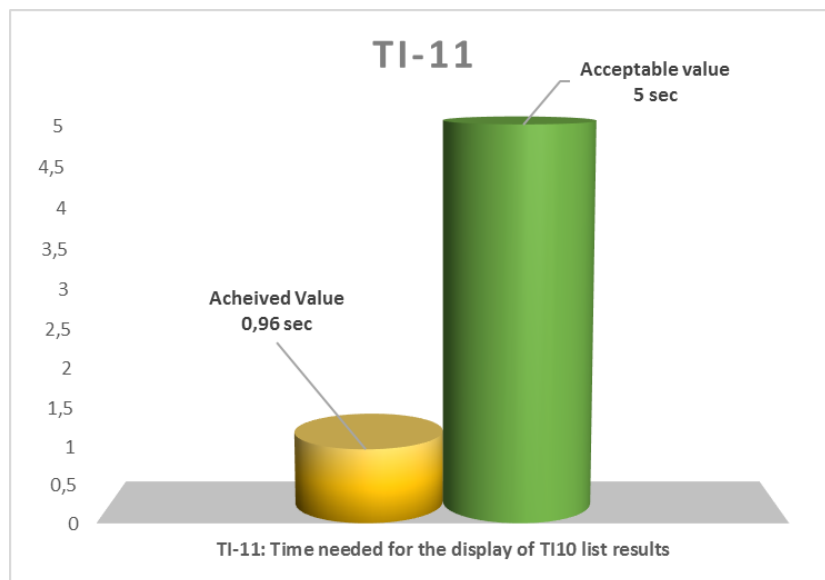
The success rate for the "compare of products" function, was estimated to 100%, since no failure were observed during the tests.



The time needed for the results of comparing products, was estimated to 0.8 sec, which is quite far from the acceptable value of 5 sec.



The success rate for the "best practices" function, was estimated to 100%, since no failure were observed during the tests.



The time needed for the results of comparing products, was estimated to 0.96 sec, which is quite far from the acceptable value of 5 sec.

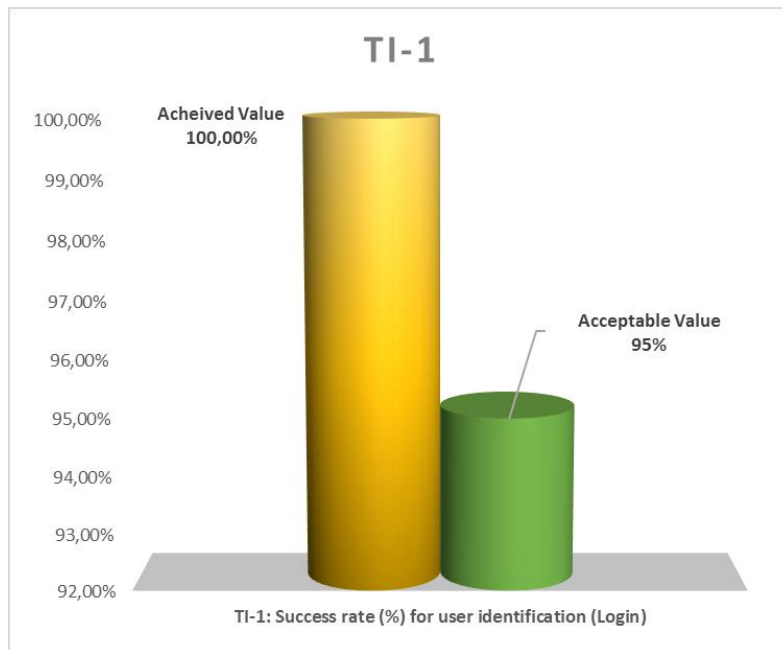
2.3.2 Evaluation Results for SMEs Functions

Table 4: Databases Evaluation Results of Technical Indicators for SMEs Functionalities

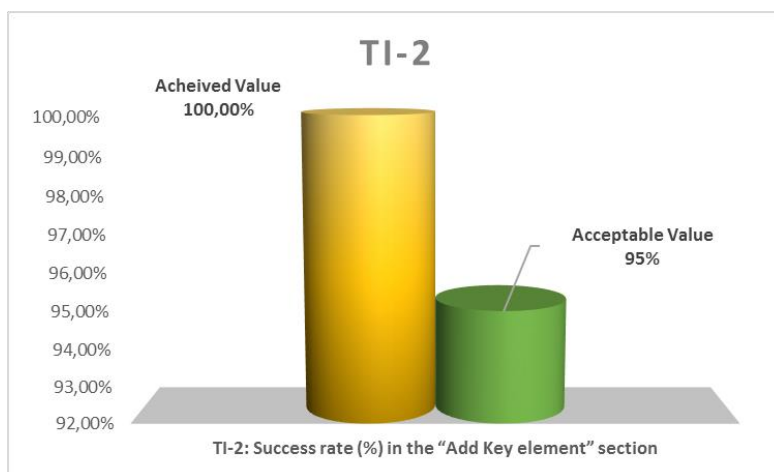
Technical Indicator	Acceptable Value	Achieved Value (after evaluation)
TI-1: Success rate (%) for user identification (Login)	95%	100,00%
TI-2: Success rate (%) in the "Add Key element" section	95%	100,00%
TI-3: Time needed for add key element of TI2	5 sec	0.34 sec
TI-4: Success rate (%) in the "List of Products" section.	95%	100,00%
TI-5: Time needed for the display of TI4 list results	5 sec	0,64 sec
TI-6: Success rate (%) in the "View of a Product" section.	95%	100,00%
TI-7: Time needed for the display of TI6 view of the product	5 sec	0,32 sec
TI-8: Success rate (%) in the "Edit/Update Product" section.	95%	100,00%
TI-9: Time needed of TI8 Edit/Update product	15 sec	9,8 sec
TI-10: Success rate (%) in the "add service" section.	95%	100,00%
TI-11: Time needed of TI10 add service.	10 sec	1,32 sec
TI-12: Success rate (%) in the "add product" section.	95%	100,00%

Technical Indicator	Acceptable Value	Achieved Value (after evaluation)
TI-13: Time needed of TI12 add product.	15 sec	9,80 sec
TI-14: Search success rate (%) in the "Search Products" section, by using key-words	95%	100,00%
TI-15: Time needed for the display of TI4 search results	5 sec	0,1 sec
TI-16: Search success rate (%) in the "Search Key elements" section, by using key-words	95%	100,00%
TI-17: Time needed for the display of TI6 search results	5 sec	0.23 sec
TI-18: Search success rate (%) in the "Search Tenders" section, by using key-words	95%	100,00%
TI-19: Time needed for the display of TI8 search results	5 sec	0,96 sec

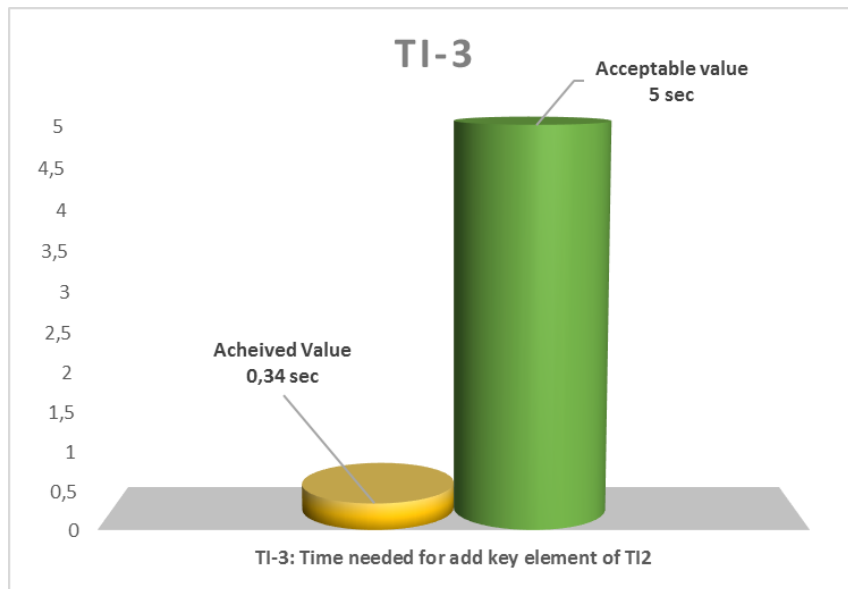
The following diagrams provide a graphic representation of the evaluation results that correspond to each technical indicator used during the technical evaluation procedure, for SMEs functions. The diagrams show all the results, comparing with the acceptable values of the technical indicators.



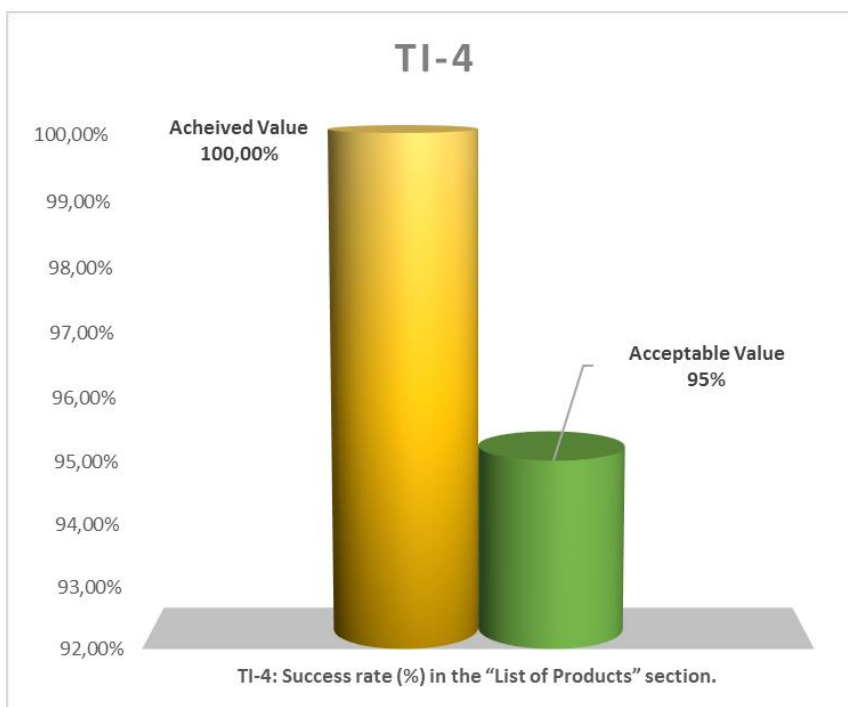
The success rate for the users' identification (login), has been rated with an 100%. Thus, all the tests for the login function have been successfully completed.



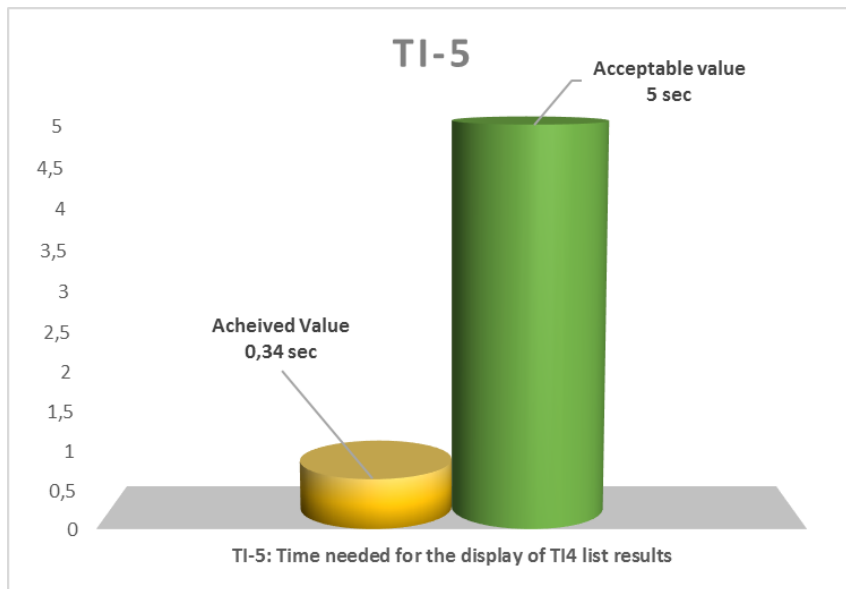
The 2nd indicators shows the results of the "add key element" function. Through the observation of the previous diagram, we can conclude that all the tests for adding a key element by SMEs, were successfully passed the acceptable value.



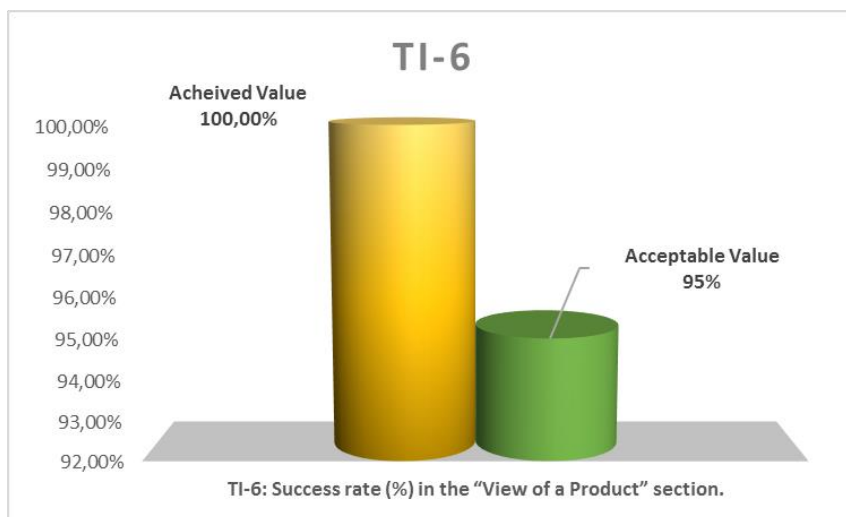
The time needed for the results of adding a key element by SMEs, was estimated to 0.32 sec, which is quite far from the acceptable value of 5 sec. Thus, this function seems to work successfully and fastly.



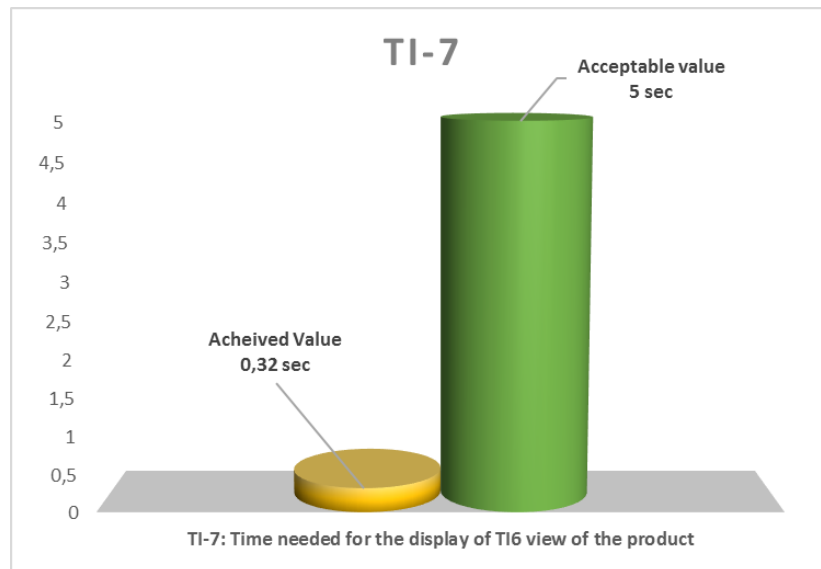
The success rate for the "list of products" function, was estimated to 100%, since no failure were observed during the tests.



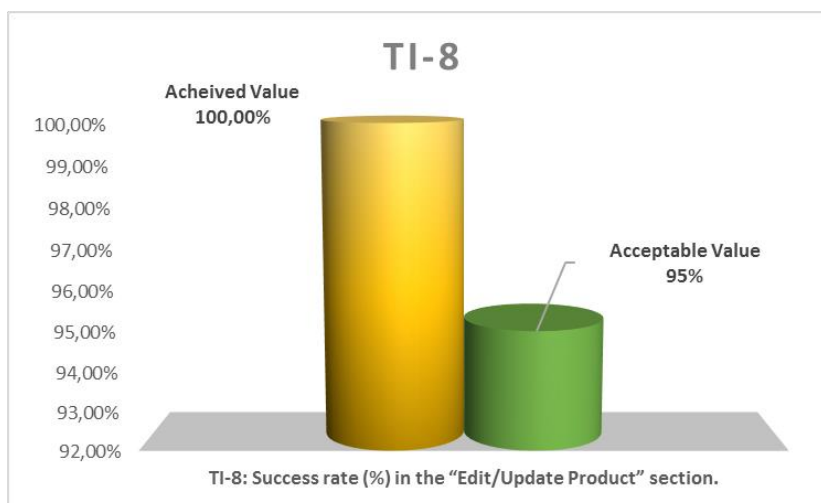
The time needed for the results of the products lists function was estimated to 0.34 sec, which is quite far from the acceptable value of 5 sec. Thus, this function seems to work really fast for the SMEs and they should be pleased time needed to get the results of the product lists.



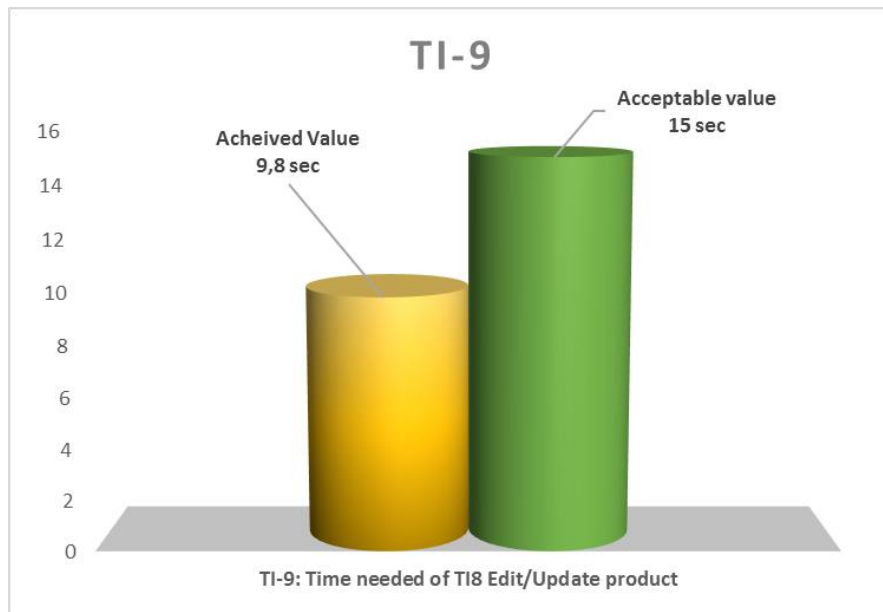
The success rate for the "view of products" function, was estimated to 100%, since no failure were observed during the tests.



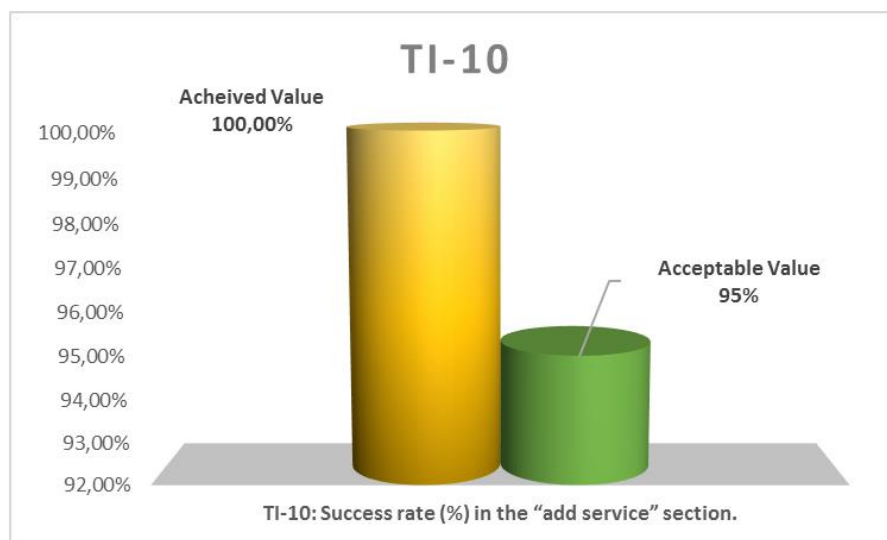
The time needed for the results of the view a product function was estimated to 0.32 sec, which is quite far from the acceptable value limit.



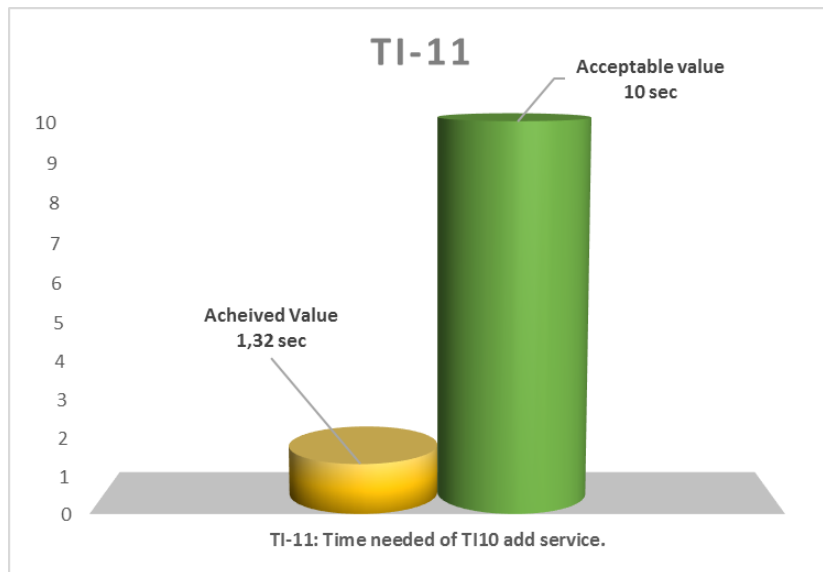
The success rate for the "view of products" function, was estimated to 100%, since no failure were observed during the tests.



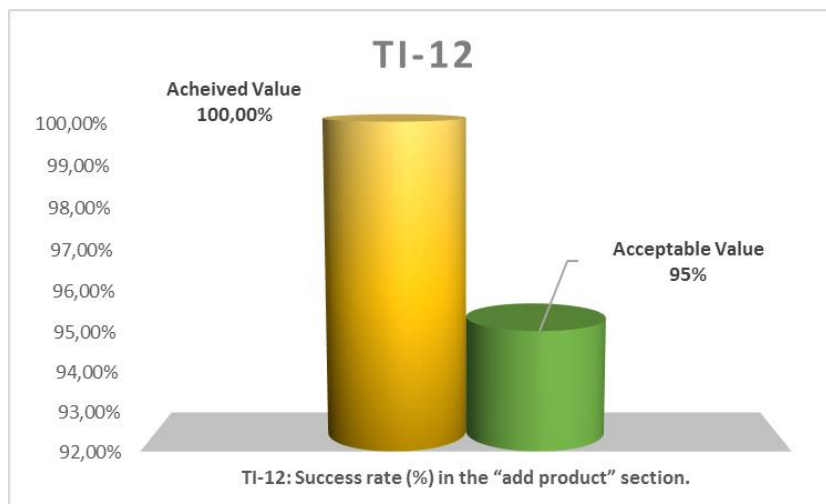
The time needed for editing/updating a product was estimated to 9.8 sec, which is quite far from the acceptable value limit (15 sec). The time for editing a product seems quite high, but it depends on the users, since they have to add the details for their products. This technical indicator, measures not only the time of the function itself, but also the time for the processing by the SMEs.



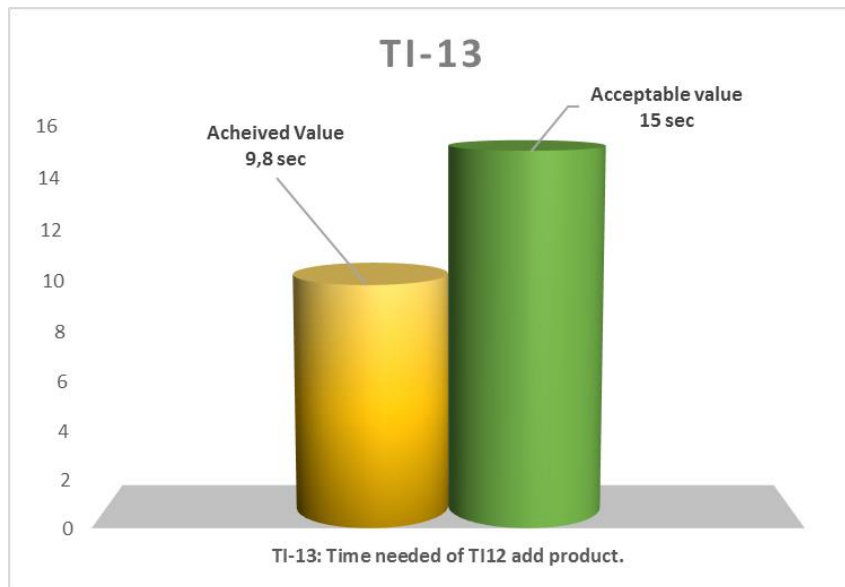
The success rate for the "edit/update a product" function, was estimated to 100%, since no failure were observed during the tests.



The time needed for adding a product was estimated to 1.32 sec, which is quite far from the acceptable value limit (10 sec). This time refers only to the function of adding a product (without the time needed for adding the product details).



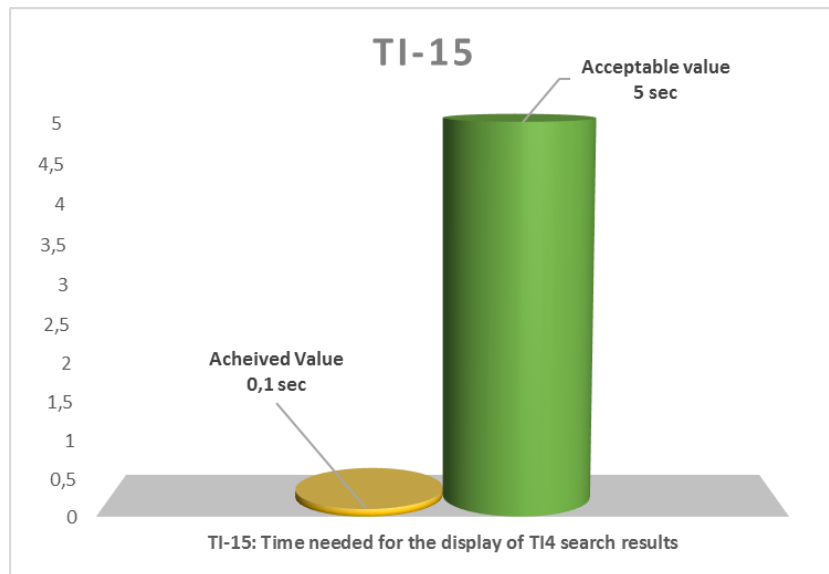
The success rate for the "add a product" function, was estimated to 100%, since no failure were observed during the tests.



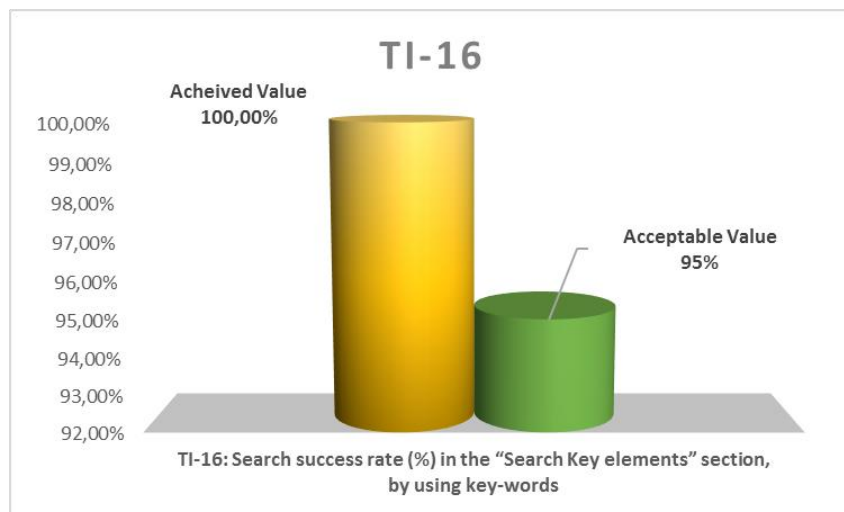
The time needed for adding a product was estimated to 9.8 sec, which is quite far from the acceptable value limit (15 sec). This time refers also to the time needed for adding the product's details.



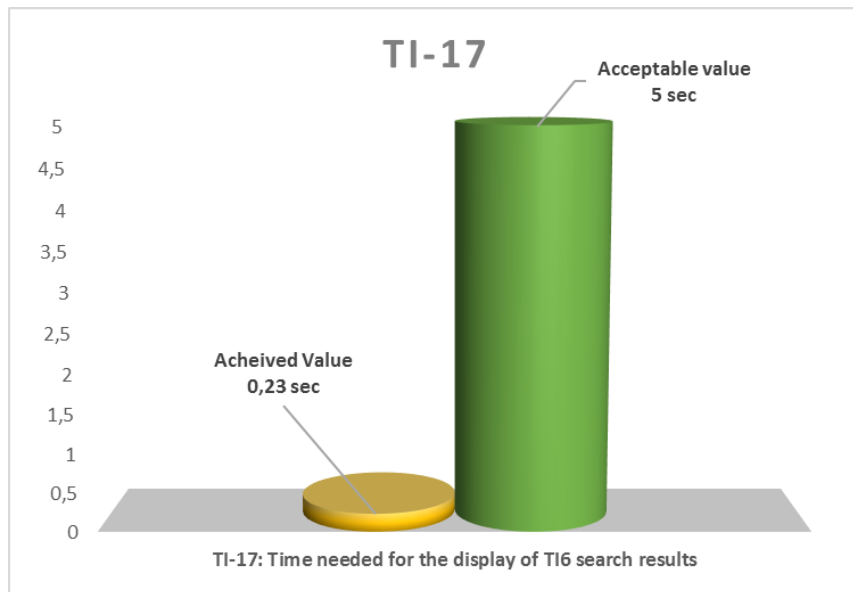
The success rate for the "adding a product" function, was estimated to 100%, since no failure were observed during the tests.



The time needed for the search results was estimated to 0.1 sec, which is quite far from the acceptable value limit (5 sec).



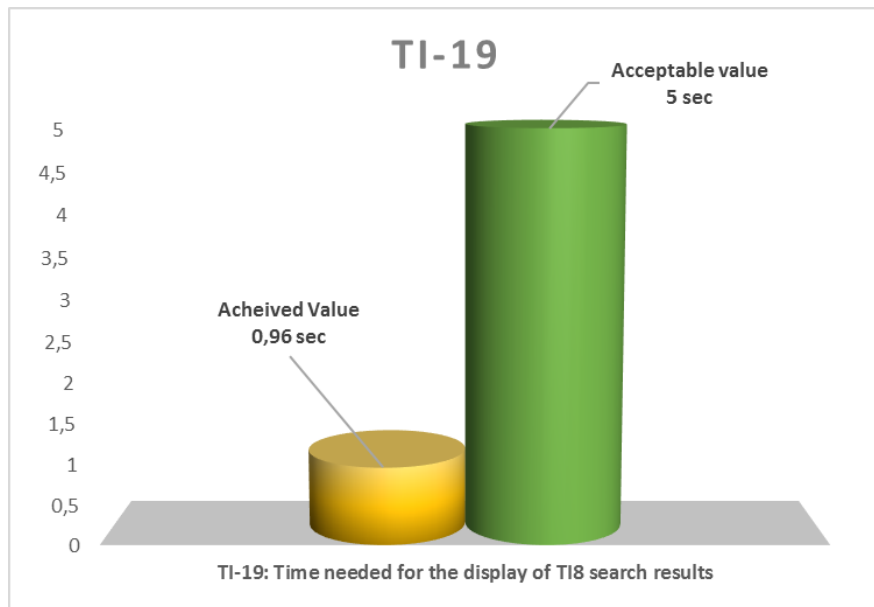
The success rate for the "search key elements" function, was estimated to 100%, since no failure were observed during the tests.



The time needed for the “search” function, was estimated to 0.23 and the acceptable rate for this function has been estimated to 5 sec.



The success rate for the “search search” function, was estimated to 100%, since no failure were observed during the tests.



The time needed for the search results was estimated to 0.96 sec, which is quite far from the acceptable value limit (5 sec).

2.4 Conclusions of the technical evaluation of GRASPINNO Databases

The implementation of the technical evaluation procedure of GRASPINNO Databases is summarized as follows:

- GRASPINNO Databases proven fully effective and productive.
- The development of the Databases was based on the continuous tests of its functionalities, thus all the separate functions work successfully, according to the technical indicators.
- In technical terms, the Databases are also quite fast, since not even one function was over the time limits (acceptable values).

3. GRASPINNO eGPP TOOL TECHNICAL INDICATORS

3.1 Breif Description

Evaluation results, derived from the technical evaluation procedure of the eGPP tool (the GRASPINNO electronic green procurement tool), were based on the outcome of laboratory testing and of both technical testing and the certification of the proper functioning of the system's software.

The technical evaluation of the system relied on the testing of two parameters: a) the reliability of the system's operations, and b) the time response of the system for certain user requests. The technical evaluation was realised with the use of "Technical Indicators", as well as with the use of "Simple Confirm Indicators".

Analytically, the collection of observations for each technical indicator, presented in this report, was realised on the basis of the following procedure:

- designation of the system characteristics measured by every indicator,
- designing of ten (10) service trials for each technical indicator, with the exception of simple confirm indicators for which five (5) trials are adequate,
- execution of trials and recording of the relevant results,
- recording of results into the corresponding tables,
- outcome of evaluation conclusions.

3.2 Evaluation of the eGPP tool with the use of Technical Indicators

The evaluation with the use of technical indicators for the eGPP tool was based on two complementary techniques: a) the conduction of

trials and the recording of results, and b) a comparison between trial values and accepted values designated by the system developers for each indicator. More specifically, the technical evaluation of the e-GPP tool was realized with the measurement and evaluation of a list of indicators presented in the following table:

Table 5: eGPP tool Technical Indicators

Technical Indicator	Acceptable Value	Remarks
TI-1: Success rate (%) for user identification (Login)	95%	
TI-2: Search success rate (%) in the "Library" section, by using key-words	95%	
TI-3: Search success rate (%) in the "Search for a Tender" section, by using key-words	95%	
TI-4: Time needed for the display of TI2 search results	5 sec	
TI-5: Time needed for the display of TI3 search results	5 sec	
TI-6: Time needed to publish a tender	15 sec	
TI-7: Time needed for the display of tender descriptions	5 sec	
TI-8: Success rate (%) for extracting a tender description	95%	
TI-9: Time needed for the display of a tender's general information.	10 sec	
TI-10: Success rate (%) for extracting a TIP	95%	
TI-11: Time needed for the display of a TIP's extraction	10 sec	
TI-12: Success rate (%) for creating a new TIP	95%	
TI-13: Success rate (%) for publishing a tender	95%	
TI-14: Success rate (%) for the display of products' main categories	95%	
TI-15: Success rate (%) for the display of products' subcategories	95%	

Technical Indicator	Acceptable Value	Remarks
TI-16: TIP_Precision	80%	n. of correct fields (fields filled in by the user while creating a TIP) in exported TIP / total n. of fields in exported TIP
TI-17: TIP_Recall	80%	n. of fields in exported TIP / total n. of fields in stored TIP
TI-18: F-Measure of TIP extraction (TIP_FM)	85%	$2 * TIP_PREC * TIP_REC / (TIP_PREC + TIP_REC)$
TI-19: TenderDescription_Precision	80%	n. of correct fields (fields filled in by the user while creating a TD) in exported TD / total n. of fields in exported TD
TI-20: TenderDescription_Recall	80%	n. of fields in exported TD / total n. of fields in stored TD
TI-21: F-Measure of Tender Description extraction (TD_FM)	85%	$2 * TD_PREC * TD_REC / (TD_PREC + TD_REC)$

3.3 Evaluation Results

The evaluation procedure of the e-GPP tool was performed with the method of technical testing and the certification of the proper functioning of the system's software, by performing iterative user trials. The achieved value for each indicator that was calculated as the average value of the sum of results of the iterative user trials for each specific indicator is presented in the table below:

Table 6: eGPP tool Evaluation Results of Technical Indicators

Technical Indicator	Acceptable Value	Achieved Value (after evaluation)	Remarks
TI-1: Success rate (%) for user identification (Login)	95%	100,00%	
TI-2: Search success rate (%) in the "Library" section, by using key-words	95%	100,00%	

Technical Indicator	Acceptable Value	Achieved Value (after evaluation)	Remarks
TI-3: Search success rate (%) in the "Search for a Tender" section, by using key-words	95%	100,00%	
TI-4: Time needed for the display of TI2 search results	5 sec	0,44	
TI-5: Time needed for the display of TI3 search results	5 sec	0,39	
TI-6: Time needed to publish a tender	15 sec	12,70	
TI-7: Time needed for the display of tender descriptions	5 sec	1,12	
TI-8: Success rate (%) for extracting a tender description	95%	1,00	
TI-9: Time needed for the display of a tender's general information.	10 sec	1,81	
TI-10: Success rate (%) for extracting a TIP	95%	100,00%	
TI-11: Time needed for the display of a TIP's extraction	10 sec	1,02	
TI-12: Success rate (%) for creating a new TIP	95%	100,00%	
TI-13: Success rate (%) for publishing a tender	95%	100,00%	
TI-14: Success rate (%) for the display of products' main categories	95%	100,00%	
TI-15: Success rate (%) for the display of products' subcategories	95%	100,00%	
TI-16: TIP_Precision	80%	1,00	n. of correct fields (fields filled in by the user while creating a TIP) in exported TIP / total n. of fields in exported TIP
TI-17: TIP_Recall	80%	1,00	n. of fields in exported TIP / total n. of fields in stored TIP
TI-18: F-Measure of TIP extraction (TIP_FM)	85%	1,00	$2 * TIP_PREC * TIP_REC /$

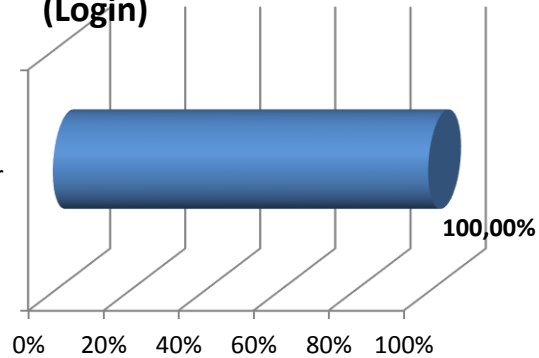
Technical Indicator	Acceptable Value	Achieved Value (after evaluation)	Remarks
			TIP_PREC+TIP_REC
TI-19: TenderDescription_Precision	80%	1,00	n. of correct fields (fields filled in by the user while creating a TD) in exported TD / total n. of fields in exported TD
TI-20: TenderDescription_Recall	80%	1,00	n. of fields in exported TD / total n. of fields in stored TD
TI-21: F-Measure of Tender Description extraction (TD_FM)	85%	1,00	$2 * TD_PREC * TD_REC / (TD_PREC + TD_REC)$

Attached in the Annex is the complete table in which detailed trial results have been registered.

The following diagrams provide a graphic representation of the evaluation results that correspond to each technical indicator used during the technical evaluation procedure.

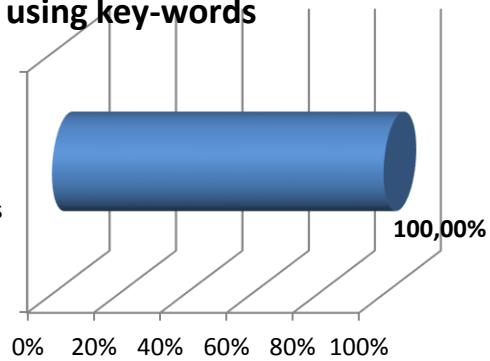
TI-1: Success rate (%) for user identification (Login)

TI-1: Success rate (%) for user identification (Login)



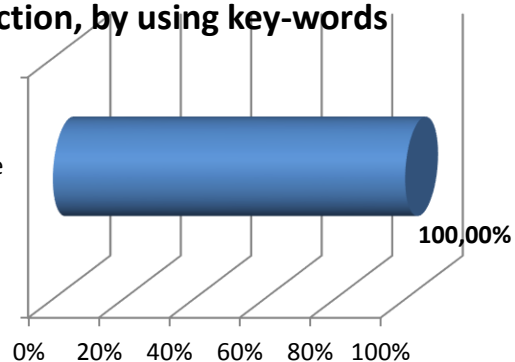
TI-2: Search success rate (%) in the “Library” section, by using key-words

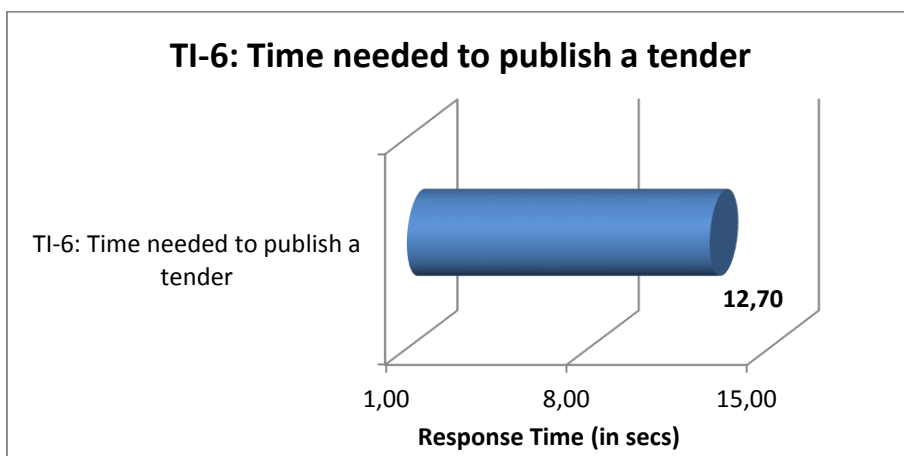
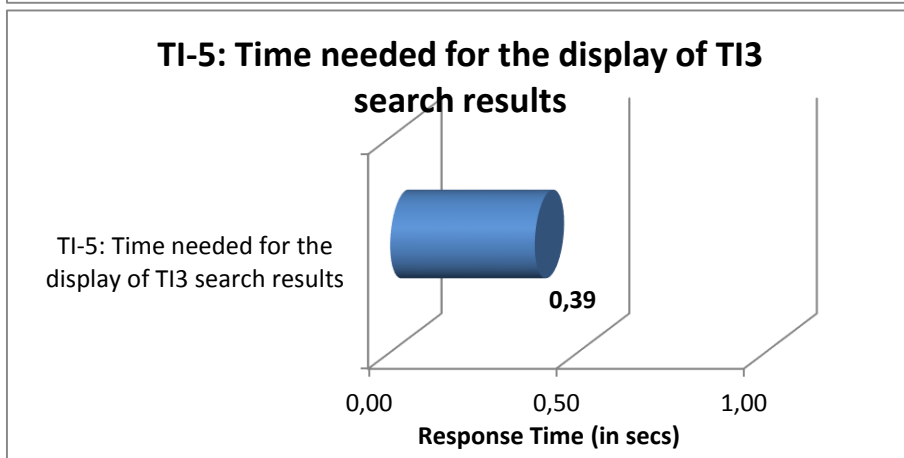
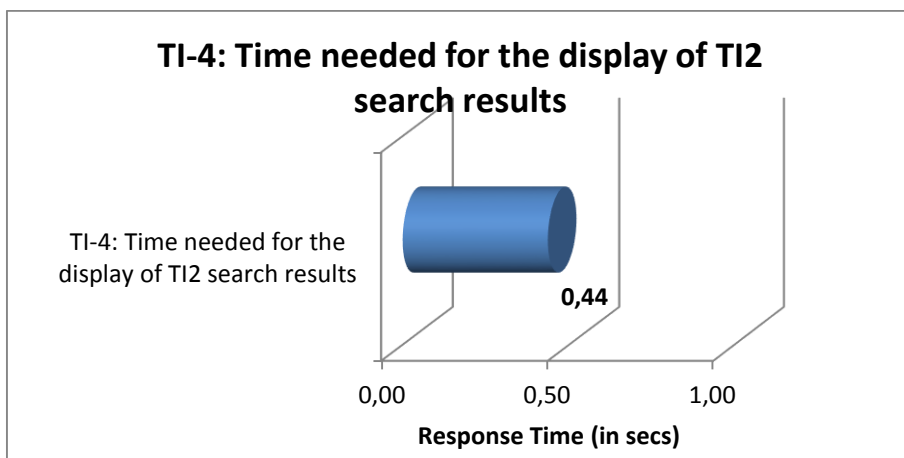
TI-2: Search success rate (%) in the “Library” section, by using key-words



TI-3: Search success rate (%) in the “Search for a Tender” section, by using key-words

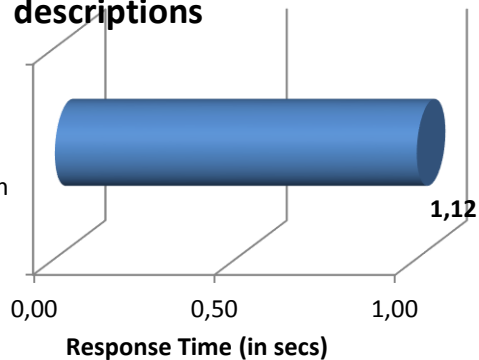
TI-3: Search success rate (%) in the “Search for a Tender” section, by using key-words





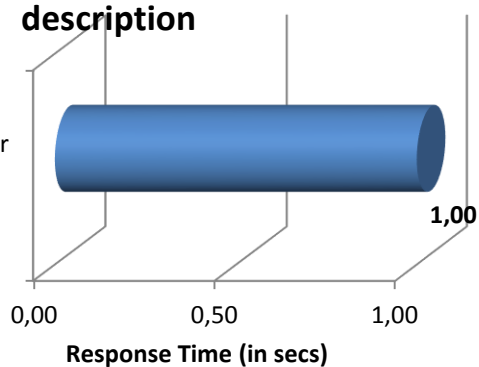
TI-7: Time needed for the display of tender descriptions

TI-7: Time needed for the display of tender description



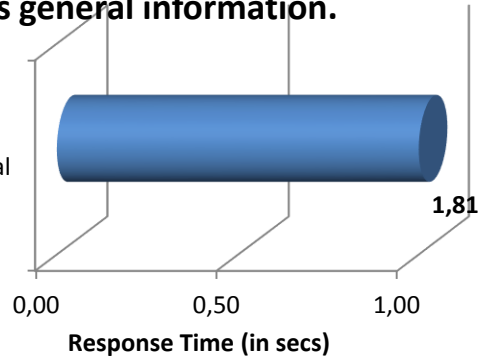
TI-8: Success rate (%) for extracting a tender description

TI-8: Success rate (%) for extracting a tender description



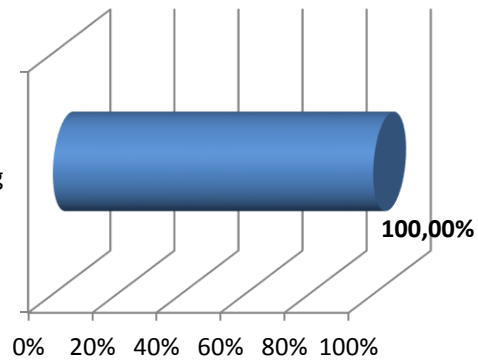
TI-9: Time needed for the display of a tender's general information.

TI-9: Time needed for the display of a tender's general information.



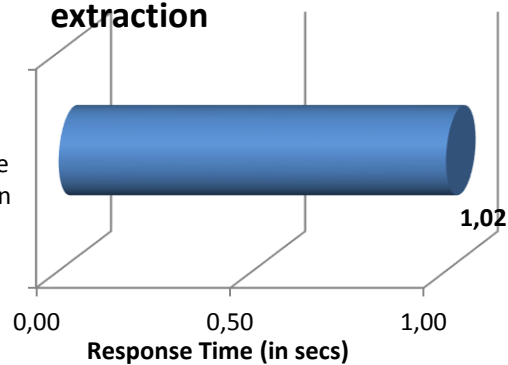
TI-10: Success rate (%) for extracting a TIP

TI-10: Success rate (%) for extracting a TIP



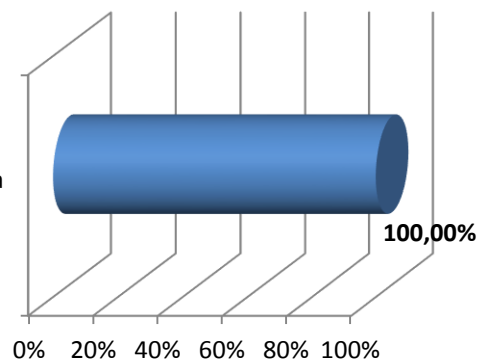
TI-11: Time needed for the display of a TIP's extraction

TI-11: Time needed for the display of a TIP's extraction



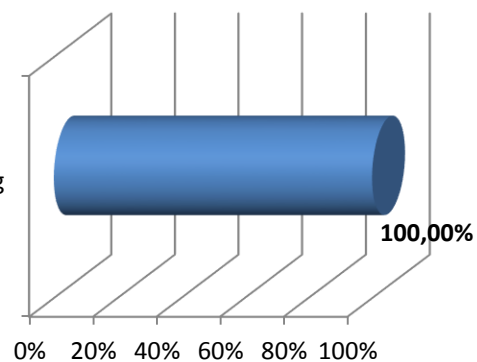
TI-12: Success rate (%) for creating a new TIP

TI-12: Success rate (%) for creating a new TIP



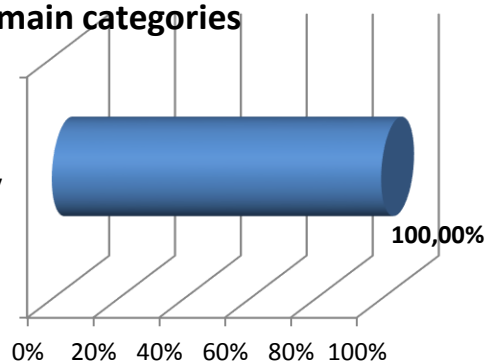
TI-13: Success rate (%) for publishing a tender

TI-13: Success rate (%) for publishing a tender



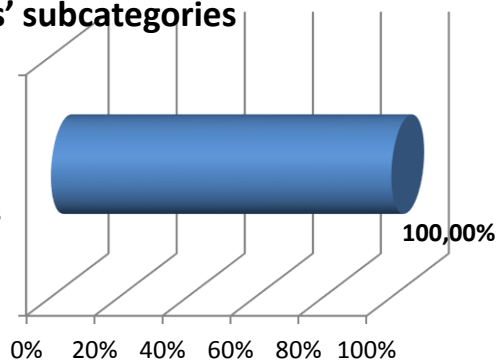
TI-14: Success rate (%) for the display of products' main categories

TI-14: Success rate (%) for the display of products' main categories



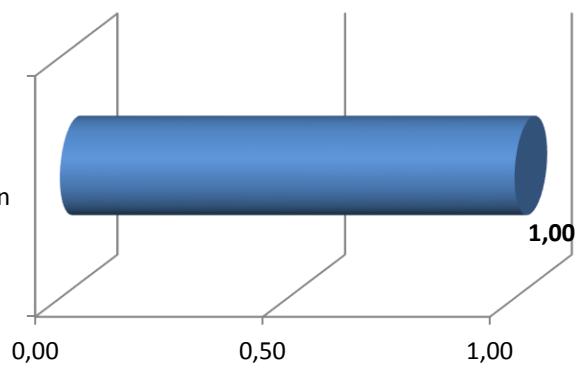
TI-15: Success rate (%) for the display of products' subcategories

TI-15: Success rate (%) for the display of products' subcategories



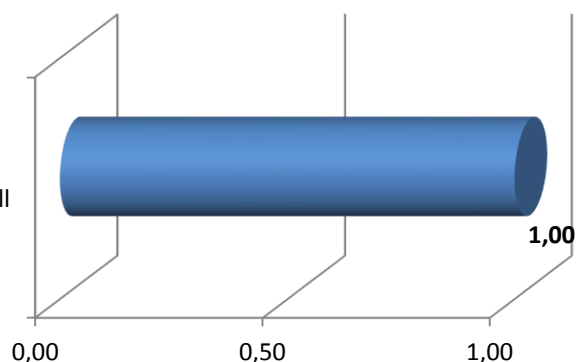
TI-16: TIP_Precision

TI-16: TIP_Precision

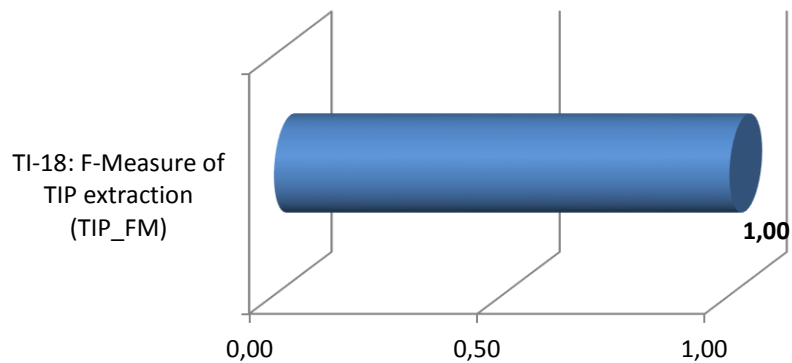


TI-17: TIP_Recall

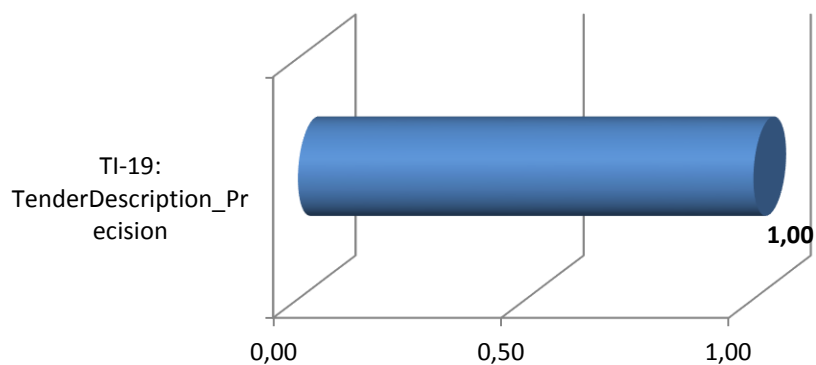
TI-17: TIP_Recall



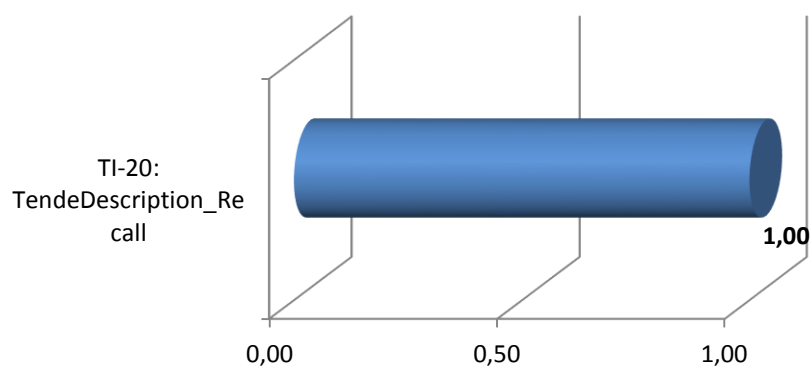
TI-18: F-Measure of TIP extraction (TIP_FM)

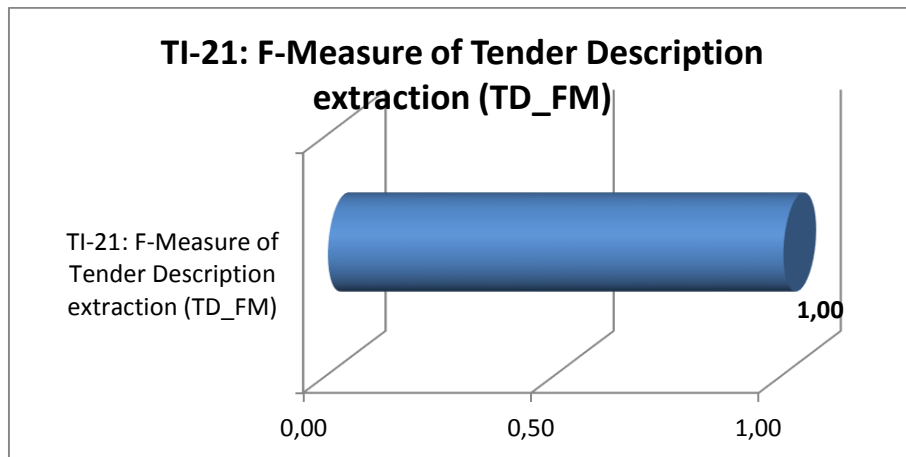


TI-19: TenderDescription_Precision



TI-20: TenderDescription_Recall





3.4 Conclusions of the technical evaluation

The implementation of the technical evaluation procedure of the integrated eGPP tool led to the following conclusions:

- The development and implementation of the eGPP software was based on a continuous check of the integrity and reliability of the basic operations of the system. With the completion of laboratory trials, the sum of omissions, failures, and errors that were identified, were completely rectified. Hence, the lack of execution errors of the implemented system operations was certified.
- The technical examination of the eGPP tool during laboratory trial, certified the correctness and reliability of the services offered by the system, from the perspective of the needs and expectations of the user.

4. eGPP TOOL'S SIMPLE CONFIRM INDICATORS

4.1 General Description

Simple Confirm Indicators were additionally used for the technical evaluation of the GRASPINNO eGPP tool. With this method, the success or failure of a specified functionality was verified through a simple test. In the majority of cases, this was done by examining the system functionality and confirming the existence or absence of the particular functionality.

4.2 Evaluation with the use of Simple Confirm Indicators

In the case of simple confirm trials, a limited number of trials was conducted (up to 5) in order to certify the reliability of the relevant system operation. The following table presents the results of the evaluation procedure with the use of identified Simple Confirm Indicators. If a particular functionality is available, then the respective box is checked. Otherwise, NO is checked, and a remark is noted.

Table 7: eGPP tool Evaluation Results of Simple Confirm Indicators

Code	Simple Confirm Indicator	Successful (Functionality existent) / YES	Unsuccessful (Functionality non-existent) / NO	Remarks
SCI-1	User Registration functionality	☒	☐	
SCI-2	Functionality for User Authentication	☒	☐	
SCI-3	User Management functionality (i.e. User roles, DB authentication)	☒	☐	
SCI-4	e-GPP tool General Information (i.e. tool description, User Guide, FAQs section)	☒	☐	

Code	Simple Confirm Indicator	Successful (Functionality existent) / YES	Unsuccessful (Functionality non-existent) / NO	Remarks
SCI-5	Option of choosing more than one language	☒	☐	
SCI-6	"Library" functionality	☒	☐	
SCI-7	Search Functionality for documents related to "green" specs	☒	☐	
SCI-8	Functionality to upload documents related to "green specs, products, services, procurement, and other "green" characteristics)	☒	☐	
SCI-9	Search Functionality for published tenders	☒	☐	
SCI-10	Functionality for publishing tenders	☒	☐	
SCI-11	Deletion of a published tender	☐	☒	This functionality will be available in an updated version of the eGPP tool
SCI-12	Multilingual "Create new tender" functionality	☒	☐	
SCI-13	Deletion of a tender description	☒	☐	
SCI-14	Creation of new TIP	☒	☐	
SCI-15	Functionality for adding "green" specs in a TIP	☒	☐	
SCI-16	Functionality for adding "green" products/services (found after performing a search in the available products	☒	☐	

Code	Simple Confirm Indicator	Successful (Functionality existent) / YES	Unsuccessful (Functionality non-existent) / NO	Remarks
	in the tool's DB) in a TIP			
SCI-17	Ability to define "green" criteria to be satisfied in a tender	☒	☐	
SCI-18	Addition/Deletion of "green" criteria from products/services.	☒	☐	
SCI-19	Editing the values of "green" criteria	☒	☐	
SCI-20	Search functionality for products/services suppliers	☒	☐	
SCI-21	Extraction of a TIP in a readable/editable format	☒	☐	
SCI-22	Deletion of a TIP	☒	☐	
SCI-23	When the system is down, all stored information is not deleted	☒	☐	
SCI-24	The system offers added-value to the work of the user	☒	☐	
SCI-25	Implementation of the e-GPP tool, in a Windows environment	☒	☐	

5. GRASPINNO LCC TOOL TECHNICAL EVALUATION

5.1 Introduction

Based on the previous report, Del. 3.6.1 - Technical report on the tests of the unified platform (methodology, results, malfunctions, solutions, improvements), this report 3.10.1 introduces a method that gives an assessment in terms of compliance with the project objectives. While in the previous report the subject was the methodology and the correctness of the measurement, in the new one a measure of the compliance with an environmental and economic standard has been introduced. The standard is represented by a LCC performance of a previous product and/or service. To verify the productivity and effectiveness a relative comparison is needed. In other word, the tools work if they are able to not only measure the Life Cycle Cost but to improve a previous condition.

The LCC tool, as part of the GRASPINNO platform, supports the purchaser in calculating life cycle costs and evaluating the most economical offer under consideration of energy relevant criteria. The life cycle costs are provided as excel sheets and can be adapted to specific needs. For a detailed description, the reader should consider the LLC use manual and the deliverable on its improvement; even if the tool is well working and give us a correct value of the cost, it is not able to give an assessment about it is productivity and effectiveness if not compared with a previous situation. As regards the LCC, the project objective is having a purchase with a lower LCC and/or GHG emissions.

As regards the methodology, minor changes have been introduced but the sole important change introduced in this report is a different and additional possible use of the tool that adds a consistent additional value; in fact, during the technical meeting held in Sorrento, TERRE DI SIENA LAB illustrated the LCC tool to be used ex ante by local PAs as an additional tool to improve their capability of implementing correctly the GPP tender (in terms of the environmental and economical sustainability).

Regarding the end of the period in which the pilot projects had to be implemented, some Technical Performance Indicators (TPIs) have been introduced on the quality of the pilot tenders in relationship with the application of the LCC tool.

According to the European and national legislations, a tender is regular when it contains all the requested GPP criteria, but it still can present some negative environmental and economic impacts. The LCC tools (ex ante and ex post) try to verify these aspects. In other words, the tool gives the opportunity to avoid this bias.

5.2 Methodology

For the individuation of Technical Performance Indicators (TPIs) an evaluation table (see below) has been introduced with three levels of efficiency. Every pilot can be assessed with this method.

A first level of efficiency is given by the timing of the use; in particular, an ex ante use of the LCC tool has a higher value of efficiency because it can avoid the generation a bad result after the implementation of the tender (a bad implementation means a higher LCC value or a higher CO2 emission value is generated). In theory, this level would be enough for assessing the pilot and the further levels wouldn't be needed because the ex ante application is able to avoid a bad result by modifying some specifications of the same tender before the publication. It means that if the LCC or GHG emissions value is higher than the previous situation, a PA should change products for the energy refurbishment (increasing the performance) or reduce their price.

A second level of efficiency is given by a LCC value that can be obtained by comparing the results of the LCC as found through the tool; if the value of the new product/service is higher than the old one, then the tender has had a bad result. This level is considered to be higher than A the third one, because it can offset a higher emission value, the sole element measured by the third order level. In fact, LCC value contains also the emissions value, if it is lower than a previous situation it means that is able to offset the value of the emissions, obtainable through the tool

A third level of efficiency is given by the emission value obtained through the tool; if the value is higher, then the tender has had a bad result.

A clear representation of the scheme of the Technical Performance Indicators (TPIs) is available in the following table:

table measuring the efficiency of the LCC tools

Level	Order	Presence (score)	Absence (score)
Ex ante LCC application	I	Yes (3)	No (0)
New product with lower LCC value	II	Yes (2)	No (0)
New product with lower CO2 emission value	III	Yes (1)	No (0)

5.3 Conclusions

Considering the recent implementation of the pilot tenders, with this system of Technical Performance Indicators the partnership is able to classify the results of the pilots on the basis of the table described in Section 2. The first level indicator would be already enough to establish that the tender procedure is correct.

Even if the presence of mistakes cannot be excluded, in theory a technician has a powerful instrument (ex ante LCC tool) to avoid a bad result in the tender procedure. TSL stresses that unexpected results that could occur with the previous version of the tool (ex post LCC tool), can be corrected only changing the specifications of the future tenders have the same characteristics; moreover, their presence doesn't mean that the tender is wrong but only that it, even if the procedure seems formally correct, hasn't been set up well.

In the event of an ex post application, the second and the third levels should be verified. The second-level indicator has a higher importance than the third because it can offset a higher emission value. However, but the greenhouse negative effects cannot be excluded only by analyzing the second level.

Last, the presence of the positive condition for each level (cells with “Yes” in green color) classifies the pilot as best performer. If the positive condition is not present for each level, the first order is the most important and, on the contrary, the third one is the worst. The qualitative system of evaluation can be transformed in a quantitative assessment by using a different numerical value for every specific characteristic reported in the table ((3) for ex ante application, (2) for lower LCC value and (1) for lower emissions value). The absence of each of the above mentioned characteristics gives always a value equals to 0. This opportunity, also reported in the table with the numbers in the brackets, allows to consider a minimum level of efficiency and productivity of the tool. A value of 3 (50% of the maximum amount obtainable by this evaluation) can be considered enough. Unfortunately, at the moment of the publication of the pilot tenders, the ex ante tool wasn’t available but it should be used during the Living Lab process.

Annex I_Trial Results on eGPP tool evaluation

The following table includes the results of each iterative trial, as well as, the final outcome for every technical indicator examined. The evaluation result calculated as the average number of the sum of trial results. Conclusions drawn from studying the outcome of the technical evaluation procedure of the integrated eGPP tool, can be found in section 3.4 of the present report.

Technical Indicator	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Trial results
TI-1: Success rate (%) for user identification (Login)	1	1	1	1	1	1	1	1	1	1	100,00%
TI-2: Search success rate (%) in the "Library" section, by using key-words	1	1	1	1	1	1	1	1	1	1	100,00%
TI-3: Search success rate (%) in the "Search for a Tender" section, by using key-words	1	1	1	1	1	1	1	1	1	1	100,00%
TI-4: Time needed for the display of TI2 search results	0,49	0,5	0,48	0,46	0,42	0,51	0,36	0,35	0,4	0,39	0,44
TI-5: Time needed for the display of TI3 search results	0,37	0,44	0,47	0,36	0,36	0,35	0,38	0,4	0,36	0,36	0,39
TI-6: Time needed to publish a tender	8,74	9,82	15,55	12,43	13,71	13,86	14,2	12,86	12,73	13,09	12,70
TI-7: Time needed for the display of tender description	1,29	1,3	1,2	1,03	1,09	1,02	1,03	1,04	1,08	1,11	1,12
TI-8: Success rate (%) for extracting a tender description	1	1	1	1	1	1	1	1	1	1	1,00
TI-9: Time needed for the display of a tender's general information.	1,74	1,87	1,54	1,92	2,09	1,78	1,76	1,81	1,73	1,84	1,81
TI-10: Success rate (%) for extracting a TIP	1	1	1	1	1	1	1	1	1	1	100,00%
TI-11: Time needed for the display of a TIP's extraction	1,28	1,24	0,91	0,7	0,91	0,96	1,03	0,94	1,16	1,07	1,02
TI-12: Success rate (%) for creating a new TIP	1	1	1	1	1	1	1	1	1	1	100,00%

TI-13: Success rate (%) for publishing a tender	1	1	1	1	1	1	1	1	1	1	100,00%
TI-14: Success rate (%) for the display of products' main categories	1	1	1	1	1	1	1	1	1	1	100,00%
TI-15: Success rate (%) for the display of products' subcategories	1	1	1	1	1	1	1	1	1	1	100,00%
TI-16: TIP_Precision	1	1	1	1	1	1	1	1	1	1	1,00
TI-17: TIP_Recall	1	1	1	1	1	1	1	1	1	1	1,00
TI-18: F-Measure of TIP extraction (TIP_FM)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
TI-19: TenderDescription_Precision	1	1	1	1	1	1	1	1	1	1	1,00
TI-20: TendeDescription_Recall	1	1	1	1	1	1	1	1	1	1	1,00
TI-21: F-Measure of Tender Description extraction (TD_FM)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00