

Testing report

Acme Ans D04



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C1.025

<https://github.com/cesmarvan/Acme-ANS-D04>

Seville may 26, 2025

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1. Executive Summary

This document presents the outcomes of the tests conducted on the functionalities developed by student 4 for the customer assistance agent within the Acme ANS system. The functional tests were designed to verify the system's correct behavior under various scenarios, including valid inputs, invalid and unauthorized access, ensuring that the established validations were met without detecting critical errors.

Additionally, performance tests were performed on two different devices. The recorded response times were statistically analyzed, including the calculation of 95% confidence intervals and mean comparisons using a Z-test, to assess the system's efficiency across different environments.

The results obtained lead to the conclusion that the tested functionalities are robust, stable, and adequately fulfill the established requirements from both a functional and performance perspective.

2. Revision table

Version	Date	Description
0.0	23/05/2025	Initial version
1.0	24/06/2025	Implementing Functional Testing
2.0	26/05/2025	Implementing Performance Testing

3. Introduction

The purpose of this report is to document and evaluate the functional and performance testing conducted on the system developed as part of the Acme ANS project, focusing specifically on the functionalities related to the AssistanceAgent role. These tests were carried out by Student 4 and involve essential operations concerning the Claim and TrackingLog entities.

Functional tests were organized based on systematic validation criteria to guarantee the system operates correctly under various usage scenarios. Concurrently, performance tests were conducted on multiple devices, with the collected data undergoing statistical analysis to draw meaningful conclusions about the application's efficiency across different technical environments.

This report offers a thorough overview of the quality assurance process, providing valuable insights for assessment and ongoing improvement.

4. Functional Testing

In this section, the different test cases carried out by Student 4, corresponding to requirements 8 and 9, will be presented. The description of the test case, the result of the test case, and the effectiveness of finding bugs will be displayed.

4.1 Test cases for list features

Description	Result	Bugs detected
List Claims not resolved	All claims not resolved belonging to an assistance agent were shown	None
List Claims resolved	All claims resolved belonging to an assistance agent were shown	None
List Claims not resolved that don't belong to the authenticated assistance agent	An error appeared access not authorise	None
List Claims resolved that don't belong to the authenticated assistance agent	An error appeared access not authorize	None
List claims not resolved with another user who is not an assistance agent	An error appeared access not authorise	None
List claims resolved with another user who is not an assistance agent	An error appeared access not authorise	None
List trackingLogs of a claim that belongs to the authenticated assistance agent	All tracking logs belonging to that claim where shown	None
List tracking logs of a claim that don't belongs to the authenticated assistance agent	An error appeared access not authorise	None
List tracking logs of a claim with another user who is not an assistance agent	An error appeared access not authorise	None

4.2 Test cases for show features

Description	Result	Bugs detected
Show a claim	The data related to that claim was shown	None
Show a claim that doesn't belong to the authenticated assistance agent	An error appeared access not authorise	None
Show a claim with another user who is not an assistance agent	An error appeared access not authorise	None
Show a tracking log	The data related to that tracking log was shown	None
Show a tracking log of a claim that does not belong to the authenticated assistance agent	An error appeared access not authorise	None
Show a tracking log of a claim with another user who is not an assistance agent	An error appeared access not authorise	None

4.2 Test cases for create features

Description	Result	Bugs detected
Create a claim with all fields empty	The system prevented the creation of the claim with non-blocking errors	None
Create a claim with a leg that shouldn't be accessible to the assistance agent	An error appeared access not authorise	None
Create a claim with an invalid passenger email	The system prevented the creation of the claim with a non-blocking error in the code format	None
Create a claim with a valid passenger email	The system allowed the creation of the claim	None
Create a claim with an invalid description	The system prevented the creation of the claim with a non-blocking error in the code format	None
Create a claim with a valid description	The system allowed the creation of the claim	None
Create a claim with a changed claim Type class value	An error appeared access not authorize	None
Create a claim without modifying the claim type class value(value withing the values listed)	The system allowed the creation of the claim	None
Create a claim by modifying the status (read-only value)	The system allowed the creation of the claim, it's a transient value	None

Create a claim without modifying the status (read-only value)	The system allowed the creation of the claim	None
Create a tracking log with all fields empty	The system prevented the creation of the tracking log with non-blocking errors	None
Create a tracking log with an invalid step	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with a valid step	The system allowed the creation of the tracking log	None
Create a tracking log with an invalid percentage resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with a valid resolution percentage	The system allowed the creation of the tracking log	None
Create a tracking log with a changed AcceptedIndicator class value(status)	An error appeared access not authorize	None
Create a tracking log without modifying the AcceptedIndicator class value(value within the list used)	The system allowed the creation of the tracking log in the cases it should	None
Create a tracking log with an invalid resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with a valid resolution	The system allowed the creation of the tracking log in the cases it should	None
Create a tracking log with resolution percentage != 100.0 and status != PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with resolution percentage = 100.0 and status = PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with resolution percentage != 100.0 and status = PENDING	The system allowed the creation of the tracking log in the cases it should	None
Create a tracking log with resolution percentage = 100.0 and status != PENDING	The system allowed the creation of the tracking log in the cases it should	None
Create a tracking log with resolution percentage != 100.0 and something written in resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with resolution percentage = 100.0 and resolution empty	The system prevented the creation of the tracking log with a non-blocking error in the code format	None

Create a tracking log with resolution percentage != 100.0 and resolution empty	The system allowed the creation of the tracking log	None
Create a tracking log with resolution percentage = 100.0 and something written in resolution	The system allowed the creation of the tracking log	None
Create a tracking log with resolution percentage != 100.0 and checkbox = true		None
Create a tracking log with resolution percentage = 100.0 and checkbox = true	The system allowed the creation of the tracking log in the cases it should	None
	From this field to the end, we will have 1 tracking logs created for the same claim we are creating the new tracking log, tl1	
Create a tracking log with resolution percentage lower than tl1	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with the resolution percentage higher than tl1	The system allowed the creation of the tracking log	None
Create a tracking log with resolution percentage = 100.0 and the checkbox = true, when tl1.resolutionpercentage != 100.0	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with resolution percentage = 100.0 and the checkbox = true, when tl1.resolutionpercentage = 100.0 and tl1 is not published	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Create a tracking log with resolution percentage = 100.0 and the checkbox = true, when tl1.resolutionpercentage = 100.0 and tl1 is published	The system allowed the creation of the tracking log	None

4.3 Test cases for update features

Description	Result	Bugs detected
Update a claim with all fields empty	The system prevented the creation of the claim with non-blocking errors	None
Update a claim with a leg that shouldn't be accessible to the assistance agent	An error appeared access not authorise	None
Update a claim with an invalid passenger email	The system prevented the creation of the claim with a non-blocking error in the code format	None
Update a claim with a valid passenger email	The system allowed the creation of the claim	None
Update a claim with an invalid description	The system prevented the creation of the claim with a non-blocking error in the code format	None
Update a claim with a valid description	The system allowed the creation of the claim	None
Update a claim with a changed claim Type class value	An error appeared access not authorize	None
Update a claim without modifying the claim type class value(value withing the values listed)	The system allowed the creation of the claim	None
Update a claim by modifying the status (read-only value)	The system allowed the creation of the claim, it's a transient value	None
Update a claim without modifying the status (read-only value)	The system allowed the creation of the claim	None
Update a tracking log with all fields empty	The system prevented the creation of the tracking log with non-blocking errors	None
Update a tracking log with an invalid step	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with a valid step	The system allowed the creation of the tracking log	None
Update a tracking log with an invalid percentage resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with a valid resolution percentage	The system allowed the creation of the tracking log	None
Update a tracking log with a changed AcceptedIndicator class value(status)	An error appeared access not authorised	None
Update a tracking log without modifying the AcceptedIndicator class	The system allowed the creation of the tracking log in the cases it should	None

value(value within the list used)		
Update a tracking log with an invalid resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with a valid resolution	The system allowed the creation of the tracking log in the cases it should	None
Update a tracking log with resolution percentage != 100.0 and status != PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with resolution percentage = 100.0 and status = PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with resolution percentage != 100.0 and status = PENDING	The system allowed the creation of the tracking log in the cases it should	None
Update a tracking log with resolution percentage = 100.0 and status != PENDING	The system allowed the creation of the tracking log in the cases it should	None
Update a tracking log with resolution percentage != 100.0 and something written in resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with resolution percentage = 100.0 and resolution empty	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with resolution percentage != 100.0 and resolution empty	The system allowed the creation of the tracking log	None
Update a tracking log with resolution percentage = 100.0 and something written in resolution	The system allowed the creation of the tracking log	None
Update a tracking log with resolution percentage != 100.0 and checkbox = true	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update a tracking log with resolution percentage = 100.0 and checkbox = true	The system allowed the creation of the tracking log in the cases it should	None
Update a tracking log that is published	An error appeared access is not authorize	None
Update a tracking log that doesn't belong to the authenticated assistance agent	An error appeared access is not authorize	None
Update a tracking log that doesn't exist	An error appeared access is not authorize	None
	From this field to the end, we will have 2 tracking logs	

	created for the same tl1 and tl2, we will be updating tl2	
Update tl2 with resolution percentage lower than tl1 (tl2 had higher percentage than tl1)	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update tl2 with resolution percentage higher than tl1 (tl2 had lower percentage than tl1)	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Update tl2 with the resolution percentage higher than tl1 (tl2 had higher percentage than tl1)	The system allowed the creation of the tracking log	None
Update tl2 with the resolution percentage lower than tl1 (tl2 had lower percentage than tl1)	The system allowed the creation of the tracking log	None

4.4 Test cases for publish features

Description	Result	Bugs detected
Publish a claim with all fields empty	The system prevented the creation of the claim with non-blocking errors	None
Publish a claim with a leg that shouldn't be accessible to the assistance agent	An error appeared access not authorise	None
Publish a claim with an invalid passenger email	The system prevented the creation of the claim with a non-blocking error in the code format	None
Publish a claim with a valid passenger email	The system allowed the creation of the claim	None
Publish a claim with an invalid description	The system prevented the creation of the claim with a non-blocking error in the code format	None
Publish a claim with a valid description	The system allowed the creation of the claim	None
Publish a claim with a changed claim Type class value	An error appeared access not authorize	None
Publish a claim without modifying the claim type class value(value within the values listed)	The system allowed the creation of the claim	None
Publish a claim by modifying the status (read-only value)	The system allowed the creation of the claim, it's a transient value	None
Publish a claim without modifying the status (read-only value)	The system allowed the creation of the claim	None

Publish a tracking log with all fields empty	The system prevented the creation of the tracking log with non-blocking errors	None
Publish a tracking log with an invalid step	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with a valid step	The system allowed the creation of the tracking log	None
Publish a tracking log with an invalid percentage resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with a valid resolution percentage	The system allowed the creation of the tracking log	None
Publish a tracking log with a changed AcceptedIndicator class value(status)	An error appeared access not authorised	None
Publish a tracking log without modifying the AcceptedIndicator class value(value within the list used)	The system allowed the creation of the tracking log in the cases it should	None
Publish a tracking log with an invalid resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with a valid resolution	The system allowed the creation of the tracking log in the cases it should	None
Publish a tracking log with resolution percentage != 100.0 and status != PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with resolution percentage = 100.0 and status = PENDING	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with resolution percentage != 100.0 and status = PENDING	The system allowed the creation of the tracking log in the cases it should	None
Publish a tracking log with resolution percentage = 100.0 and status != PENDING	The system allowed the creation of the tracking log in the cases it should	None
Publish a tracking log with resolution percentage != 100.0 and something written in resolution	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with resolution percentage = 100.0 and resolution empty	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with resolution percentage != 100.0 and resolution empty	The system allowed the creation of the tracking log	None

Publish a tracking log with resolution percentage = 100.0 and something written in resolution	The system allowed the creation of the tracking log	None
Publish a tracking log with resolution percentage != 100.0 and checkbox = true	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish a tracking log with resolution percentage = 100.0 and checkbox = true	The system allowed the creation of the tracking log in the cases it should	None
Publish a tracking log that is published	An error appeared access is not authorize	None
publish a tracking log that doesn't belong to the authenticated assistance agent	An error appeared access is not authorize	None
publish a tracking log that doesn't exist	An error appeared access is not authorize	None
Publish a tracking log of a claim which is not published yet	An error appeared access is not authorize	None
	From this field to the end, we will have 2 tracking logs created for the same tl1 and tl2, we will be updating tl2	
Publish tl2 with resolution percentage lower than tl1 (tl2 had higher percentage than tl1)	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish tl2 with resolution percentage higher than tl1 (tl2 had lower percentage than tl1)	The system prevented the creation of the tracking log with a non-blocking error in the code format	None
Publish tl2 with the resolution percentage higher than tl1 (tl2 had higher percentage than tl1)	The system allowed the creation of the tracking log	None
Publish tl2 with the resolution percentage lower than tl1 (tl2 had lower percentage than tl1)	The system allowed the creation of the tracking log	None

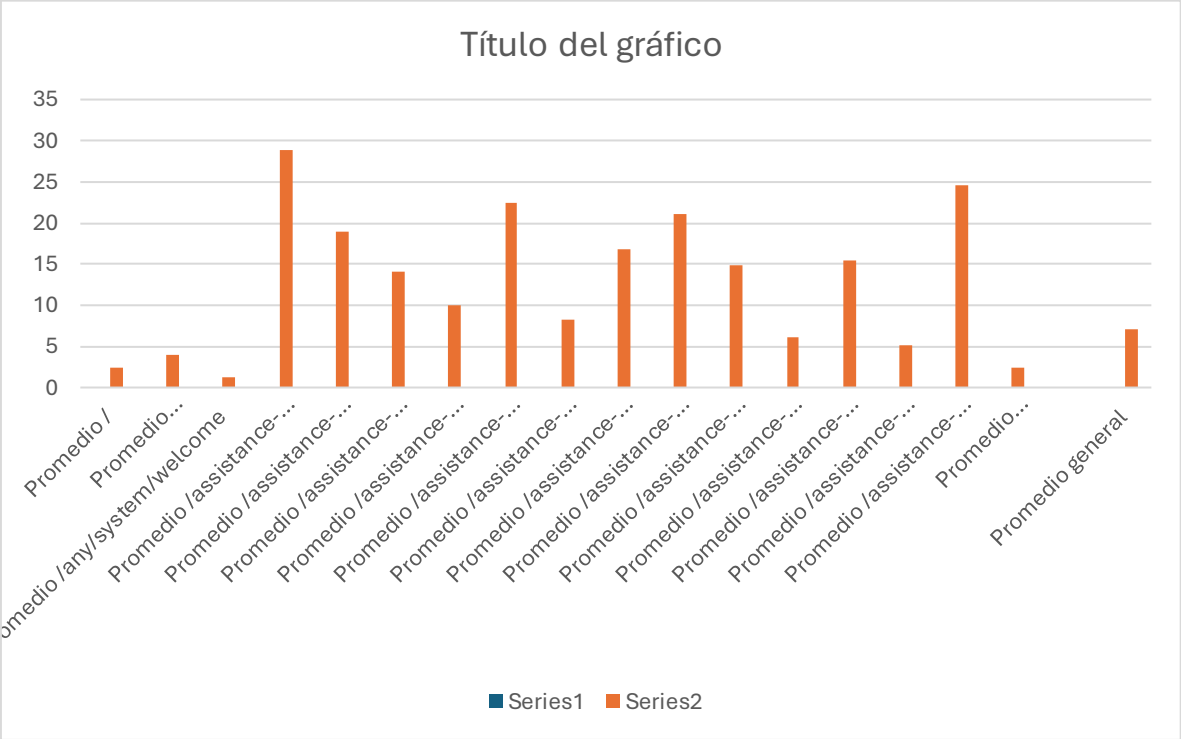
5. Performance Testing

Performance tests have been conducted on two different devices. The results on both devices will then be displayed, as well as the final comparison between the two.

5.1 First device performance tests

Regarding the first device, the following results were obtained:

averageaverage



Promedio /	2,49824505
Promedio /anonymous/system/sign-in	3,99318727
Promedio /any/system/welcome	1,30203197
Promedio /assistance-agent/claim/create	28,8679579
Promedio /assistance-agent/claim/delete	18,9559
Promedio /assistance-agent/claim/listNotResolved	14,03153
Promedio /assistance-agent/claim/listResolved	9,94677
Promedio /assistance-agent/claim/publish	22,4715308
Promedio /assistance-agent/claim/show	8,19257692
Promedio /assistance-agent/claim/update	16,7378889
Promedio /assistance-agent/tracking-log/create	21,1377412
Promedio /assistance-agent/tracking-log/delete	14,8202667
Promedio /assistance-agent/tracking-log/listclaim	6,187708
Promedio /assistance-agent/tracking-log/publish	15,3602667
Promedio /assistance-agent/tracking-log/show	5,14208889
Promedio /assistance-agent/tracking-log/update	24,5379556
Promedio /authenticated/system/sign-out	2,35480357
Promedio general	7,04226381

Where its descriptive statistics are as follows:

<i>first device</i>	
Media	8,08801314
Error típico	0,4404419
Mediana	5,15815
Moda	6,2619
Desviación estándar	9,72967951
Varianza de la muestra	94,6666633
Curtosis	14,8303917
Coeficiente de asimetría	2,91898173
Rango	92,7711
Mínimo	0,6578
Máximo	93,4289
Suma	3946,95041
Cuenta	488
Nivel de confianza(95,0%)	0,86540098

And therefore, its confidence interval is defined as:

Interval(ms)	7,22261216	8,95341413
interval(s)	0,00722261	0,00895341

5.2 Second device performance testing

For the second device, the following results were obtained:



Promedio /	1,89185385
Promedio /anonymous/system/sign-in	3,29120364
Promedio /any/system/welcome	1,19663934
Promedio /assistance-agent/claim/create	19,4474158
Promedio /assistance-agent/claim/delete	13,54215
Promedio /assistance-agent/claim/list-pending	14,114314
Promedio /assistance-agent/claim/list-complete	8,99936
Promedio /assistance-agent/claim/publish	19,7870615
Promedio /assistance-agent/claim/show	7,44787949
Promedio /assistance-agent/claim/update	17,7595111
Promedio /assistance-agent/tracking-log/create	15,2249235
Promedio /assistance-agent/tracking-log/delete	12,4420667
Promedio /assistance-agent/tracking-log/list	6,521504
Promedio /assistance-agent/tracking-log/publish	13,8528333
Promedio /assistance-agent/tracking-log/show	4,92546667
Promedio /assistance-agent/tracking-log/update	14,3038778
Promedio /authenticated/system/sign-out	2,00153571
Promedio general	5,94821337

Where its descriptive statistic is as follows:

<i>second device</i>	
Media	6,85960412
Error típico	0,33187252
Mediana	4,68285
Moda	1,153
Desviación estándar	7,33130355
Varianza de la muestra	53,7480117
Curtosis	6,93518747
Coeficiente de asimetría	2,02933431
Rango	60,5709
Mínimo	0,619
Máximo	61,1899
Suma	3347,48681
Cuenta	488
Nivel de confianza(95,0%)	0,65207876

And therefore, its confidence interval is defined as:

Interval(ms) 6,20752536 7,51168287
interval(s) 0,00620753 0,00751168

5.3 Comparison between the two devices

Using the z-test to compare the results obtained on both devices, the following is obtained:

Prueba z para medias de dos muestras

	<i>time device 2</i>	<i>time device 1</i>
Media	6,078835077	7,209483097
Varianza (conocida)	1700859355	1346244308
Observaciones	579	579
Diferencia hipotética de las medias	0	
z	-0,000492859	
P(Z<=z) una cola	0,499803378	
Valor crítico de z (una cola)	1,644853627	
Valor crítico de z (dos colas)	0,999606755	
Valor crítico de z (dos colas)	1,959963985	

A Z-test was conducted to compare the average response times between Device 1 and Device 2, based on 579 observations for each. The results showed that

although Device 1 had a slightly higher mean response time (7.21) compared to Device 2 (6.08), the calculated z-value was -0.0005, with a p-value of 0.4998. These values are far from the critical z-values for both one-tailed (± 1.6449) and two-tailed (± 1.96) tests, indicating no statistically significant difference between the two means. Therefore, we fail to reject the null hypothesis and conclude that the performance difference between the devices is not significant, suggesting that both devices operate with similar efficiency in the tested conditions.

6. Conclusion

This report thoroughly evaluates the functionalities assigned to the assistance agent role within the system through both functional and performance testing. The functional tests confirmed that the system handles valid, invalid, and unauthorized scenarios appropriately, with no critical errors detected. All the intended validations performed as expected, thereby maintaining the integrity of the system's behavior.

Performance testing didn't revealed notable differences between the devices tested. Statistical analysis, including Z-tests.

In summary, the results indicate a high level of reliability and stability in the functionalities assessed. This validation process plays a crucial role in guaranteeing the software's quality prior to its final release.

7. Bibliography

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