

# Non-Functional Requirements

## Abstract

While not limited to, the key non-functional requirements are:

**USABILITY** Apply good interactive design practices and concepts such as affordances and familiarity to ensure optimal usability. It is important that the system is easy to use. As such the application should be designed in a way that it is easy to use without the need for tutorials or help.

**RELIABILITY** The system will be designed to work offline as potentially some inspection sites may not have service. Share features of the app will require an internet connection. The system also needs to be stable reliable to prevent loss of work.

**PERFORMANCE** The system needs to respond promptly to input by the user. If system is busy loading screens and other prompts will be used to convey status to users.

**SECURITY** The application will not store user data, require logins, or transmit data. Any data transfers will be handled by third parties. Any passwords will be handled by third party services (email client for example).

**AUDIT** Interactions, errors, and statuses are logged. Not user filled data. This log is held locally. Bug reports will be transmitted via google play store services.

**CAPACITY** Only one device is required to use the system. While the application itself will have a small installation size, the devices free space will determine how many templates and pdfs can be stored locally.

**COMPATIBILITY** As the target hardware is android mobile phones, the devices do need to have touch input and rear facing camera. To minimize compatibility issues with outputs, PDF has been chosen as this format is able to be read by default by many systems.

**MAINTAINABILITY** The system will conform to a modular architecture this will be achieved by breaking features down into components that are cohesive and loosely coupled with each other. This approach will make source code easier to read, understand, and debug while also decreasing effort required to update individual components.

NFR	TRIGGER QUESTION	Cost	Benefit	Answer	Strategy	Priority
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<b>SECURITY</b>	Will there be different types of users? Eg Manager, Employee	- Unable to differentiate users	- Simpler to use - No for additional log in	At this stage, there will not be different user types.		3
	Will there be limitations on what each type of user can do? Eg some can modify templates others can't.	- There no way to ID and limit problem users	- Simpler to use - User can use whatever part of the application they want	At this stage there will be no different users, all users will be able to create and fill in the templates.		3
	Are users expected to have a password?	- Less secure system	- Easier to use - No need to log in to be able to use the system	No, there will be no account setup at this stage.		4
	Are there any conditions required on the password?			As there are no passwords required at this stage, no password conditions are required.		4

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	Will these passwords be updated regularly?			As there are no passwords required at this stage, they do not need to be updated		4
	Can the same password be used for an extended period?			As there are no passwords required at this stage, this isn't an issue.		4
	Does the system require timeout due to inactivity?		- Stops incorrect input after being added if it's left open	Possibly	The system may only time out when creating or filling out a template, when nothing has been touched for an extended period.	4
	How long would the inactivity be to trigger an inactivity warning?			Possibly after 5 mins of no input, in case the user doesn't have a lock screen.		4

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	What happens to the system if the user is inactive?			The system will display an inactive warning pop up above the current content		4
	Does the data being stored need to be secure? Is there a risk of physical attack on the system?	- If issues on the local storage unable to access files	- No additional storages needed offsite	The data is only being store on the local device at this stage and being emailed when required.	The only risk of an attack would be if someone was able to access the file system of the phone.	1
	Is any personal information being obtained?			No personal information is being obtained and stored about the user. However personal information will possibly be present when completing the inspection.	This personal information will be inputted by the user who is inspecting the property and exported to pdf.	3
	Is the system interacting with anything outside the	- Rely on externals to be secure and safe	- Reduced application size	Yes	The system will interact with saved templates that are	3

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	system such as data or other systems?				saved outside the system and imported in.	
	Are their multiple users of the system? Do they interact?			There will be multiple users of this system, however at this stage they do not interact using the application		4
	Will the system interact with other components of the device it is running on?			Yes	The system will interact with keyboard input and camera functions from the device.	1
	Is authorisation or authentication needed?	<ul style="list-style-type: none"> <li>- No way to identify users easily</li> <li>- Allows users to do everything without restriction</li> </ul>	<ul style="list-style-type: none"> <li>- Simpler to use</li> <li>- Don't need to remember log in to use application</li> <li>- Able to do everything on the application without restriction</li> </ul>	At this stage, no.	As users are not logging in we don't need to authenticate them to insure they are valid users. Authorisation also isn't needed to use the application, if the person has the application they can	4

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					load and create templates.	
<b>AUDIT</b>	Do interactions with the application need to be timed/catalogued?			No, interactions with the application do not need to be timed or catalogued		4
	Does interacts outside the application need to be logged?			No, interactions outside the application do not need to be logged.		4
	What interactions need to be tracked?			Errors and statuses	Log errors and statuses of system entities through the implementation of a Log Manager.	2
	What sort of information about these interactions needs to be tracked? (eg date, time, data, location etc)			Error string, context, and order	Log entries in order	2

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<b>PERFORMANCE</b>	Does the system require fast start up times?	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>	<ul style="list-style-type: none"> <li>- Doesn't frustrate users by waiting</li> <li>- Users able to see how long the system will take to open</li> </ul>	The system needs to have a reasonable start up time.	The start up time should be fast but not necessarily instant. However, it shouldn't be slow either. This could be displayed using a loading bar so the user can see how long it will take.	4
	Does the system need to respond promptly to input by the user? (eg touch, keyboard input etc)	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>	<ul style="list-style-type: none"> <li>- Reduces frustration by the user</li> <li>- Show the system is responding to tasks</li> </ul>	The system should respond to user input quickly.	If the user is typing information the application should be able to keep up and display that. Likewise, if the user clicks on the area to take a photograph, the camera should load within an acceptable time. This is the same for when creating the templates.	1

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	How often does the system need to refresh the displayed information?	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>	<ul style="list-style-type: none"> <li>- Reduces frustration by the user</li> <li>- Show the system is responding to tasks</li> </ul>	System should display information as it inputted.	When a picture is taken and save, the application should refresh and display the image in the template being filled out. Text should be displayed as it is inputted. When creating a template when new elements are added it should refresh to display those.	1



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	How quickly should the inspection system export file that has been created?	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>	<ul style="list-style-type: none"> <li>- User knows how long the template will take to export via the load bar</li> <li>- The quicker it's able to be sent the better</li> </ul>	<p>Exporting the template to pdf should be done in as quickly as possible. So, it can be emailed or saved as required.</p> <p>This is the same for exporting the template once it is created, it should be done as soon as possible. This is so it can also be emailed or saved as required.</p>	There will be a load bar showing how long the export is expected to take, both when exporting the template and exporting the pdf.	1
	How fast does the system need to respond to loaded templated?	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>	<ul style="list-style-type: none"> <li>- User can see how long it will take to upload</li> </ul>	The system should be able to load the template as quick as possible, so the user can start the inspection.	There will be a load bar showing how far along the upload is taking.	1
	How quickly does the system need to			Once the system has completed exporting the	Once the load bar reaches 100%, the system should	1

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	respond to storing/saving data?			template or the pdf, it needs to allow the user to instantly save or send the template or pdf.	prompt the user to what they want to do with the pdf or template. Either to save to the device or send via email.	
	Should there be any delay between loading up the camera, taking photo and saving it to the document?	<ul style="list-style-type: none"> <li>- Can't guarantee</li> <li>- Dependant on device specifications</li> </ul>		Ideally no.	The photo should be cropped to fit the size required on the application, once this is done the image should automatically display in the field used.	1
	Will this load time vary depending on the number of modules?	<ul style="list-style-type: none"> <li>- Dependant on device specifications</li> <li>- Dependant on number of modules</li> </ul>		Most likely, the more modules, the longer the template will probably take to load	Show the user using a load bar how far through loading the template is so they understand how long it will take.	2
	What hardware will the system support?			Variety of devices using android, with a rear facing camera.		1

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	Is there any additional software required to support the system?			PDF reader, and email client	Exported PDFs will need to be viewed on a reader and an email client will be prompted to send objects (pdfs, templates, etc)	1
	Will the system need any warning messages in case a function can't occur?		- Ensures input is correct before being placed in to pdf	If there is difficult performing any task within the system, there should be an appropriate message of why.	A pop-up should come up explaining what the issue is. This is more for error handling of input.	2
<b>CAPACITY</b>	How many devices are required to run the system?		- Easy to maintain	One device		1
	Does the system need to store any data?	- No remote backup if something happens to the device	- Easy to access while on the device	The system needs to be able to store data locally on the device		1

NFR	TRIGGER QUESTION	Cost	Benefit	Answer	Strategy	Priority
	Is there a time limit on how long the data can be stored?	- May not be compatible if updates occur	- Able to use any time	No	Templates should be able to be stored as long as the user desires.	1
<b>AVAILABILITY</b>	Does the system require any maintenance?		- Up to date and functioning at its best	Like many applications it will require maintenance to keep up with the android platform as well as any bugs.	User error reporting should be made available through Google services.	4
	How would this maintenance occur?		- Keeps application up to date - Fixes bugs - Updates can be forced so the application is running at its best	Pushes as updates to the device.	Updates would be pushed to the play store, if it was critical and a major bug then you can force the user to update before they can use the application.	4
	Is the system required to be operational 24/7?		- Able to be used when the user wants	Yes	User should be able to use the system as they want, whenever they want.	1

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	Where will the system's data be stored?	- No remote backup if something happens to the device	- Easy to access while on the device	Locally	The data will be stored on the phone used by the user.	1
	Will it be stored in multiple locations?	- No remote backup if something happens to the device - Relying on the device storage		Currently, no.	The user will load and save to local storage, either from the application or an email.	1
	Do certain parts of the system have to be more available than others?			No	Both the template system and the inspection system should be readily available.	4
<b>RELIABILITY</b>	If failure was to occur for any part of the system what is an acceptable downtime?		- System can work offline	If a part of the system failed it would be mostly due to an error or bug. In this case it should be fixed as soon as possible.	If there is an error or bug it should be dealt with as soon as possible and an update pushed to fix the problem.	1

NFR	TRIGGER QUESTION	Cost	Benefit	Answer	Strategy	Priority
	How quickly would each part of the system be expected to recover from failure?			As soon as possible		1
<b>INTEGRITY</b>	Are there restrictions on the format or medium that must be used for input or output?		- Error handling easier with restricted inputs	Input should only be touch via the phones screen, text via the phones keyboard and images from the camera on the phone.	This may include a brief notice with the attach image feature that informs the user of the maximum allowable photos (or total file size) they can attach to the template/document.	1
	If data was inaccurate how would this be resolved?			Majority of the data input is user generated, accuracy is up to the user.	The option of attaching photos also allows for evidence of faults along with text to ensure accuracy of data.	3
	How important is accuracy of data within the system?			Accuracy of data with the inspect platform is important but up to	Photo features back up the textual information.	3

NFR	TRIGGER QUESTION	Cost	Benefit	Answer	Strategy	Priority
				the user to make sure it is correct.		
	Do the images taken need to be compressed in anyway?	- Lower quality images	- pdf will be reduced in size as the image are of lesser quality - The application will take up less space if it is temporarily storing these images in a smaller format	Yes	Either the photo as it is taken will have restriction of the size or after taking the photo the user would have to crop the image to fit there required field. These images would be compressed to a lossy format such as jpeg to reduce size, but it will impact quality.	1
	Are there restrictions on the format or medium that must be used for input or output?		- Error handling easier with restricted inputs	Yes	Text input can be filled out via the installed keyboard on the android device. Images can be added using the camera and saved to a lossy format to save space.	1

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					Files exported should be saved to pdf.	
RECOVERY	Is there a need to track errors?		- Allows you to know how the error occurred	Yes, if errors occur they should be able to be logged and tracked.	Errors will be tracked via a Log Manager which handles the reporting, logging and displaying of errors.	1
	Are there expectations on reporting errors?	- Relying on users to realise the error	- Able to see error that didn't occur in testing	If there is an error with the application, users along with other entities that manage templates and files should be able to report the error via a Log Manager.		3



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	How often will the system be backed up?	<ul style="list-style-type: none"> <li>- Relying on user to back up the data and send it appropriately</li> <li>- Email has limited size on attachments</li> </ul>	<ul style="list-style-type: none"> <li>- Less space used</li> </ul>	The system itself won't need to be backed up. However, the user will have to rely on saved data or emails to recover missing templates or pdf.		3
	What is required to recover data?	<ul style="list-style-type: none"> <li>- Relying on user to back up the data and send it appropriately</li> <li>- Email has limited size on attachments</li> </ul>		Saved data or emails to recover missing templates or pdf.		3
<b>COMPATIBILITY</b>	Does the system have any input coming from outside the system?			Yes	Input is coming from the camera and keyboard by the user.	1
	Does the system have any output leaving the system?			Yes	Pdf and templates are outputted by the system.	1

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	Are there any 3 <sup>rd</sup> party application that the system relies on to function?			Technically no, the system will work as intended without 3rd party applications.		4
	Are there any legacy system and/or existing platform constraints?			Yes, systems that don't have a rear facing camera won't be able to use all function on the app. While the system is only intended to run on android devices.	Ensure the phone can perform these functions by having a minimum requirement set.	1
	Is it important that the system be portable (able to move to different hardware or operating system environments)?	- Relying on the android device to be charged	- Can be used anywhere	Yes, it is important that it can run on a number on android devices and be portable.	The application will not be supported on other platforms.	1
<b>MAINTAINABILITY</b>	What architecture standard does the system need to conform too?	Time to implement and enforce		The system will conform to a modular architecture.	Build the app in a modular fashion.	1

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	What design standards does the system have to conform too?	Time to implement and enforce	Code will be easier to maintain, update, and debug	The system will be broken down into components that are cohesive and loosely coupled with other components.	Implement the standard during planning features and enforce the standard during the review process prior to merge	1
	What coding standards does the system have to conform too?	Time to implement and enforce	Code is more literate and easier to debug	Google Java Style Guide	Enforce the style guide during the review process prior to merge	1
	What parts of the system are likely candidates for later modification?			All parts of the application.	Updates made available to improve on existing features.	2
	What sorts of modifications are expected?			Bug fixes, improved functionality, adjustments due to android updates	These modifications to be made available through regular updates.	2
	Who will be responsible for system maintenance?			Developers		2

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<b>USABILITY</b>	How will the system ensure it is easy to use?	- Assumption the user has used other applications before to understand that	- Users should have some understand what those icons do without explanation reducing the learning curve	Common design elements such as buttons, layout consistent to maintain flow, keep with known icons to create familiarity	Apply good interactive design practices and concepts such as affordances and familiarity to ensure optimal usability.	1
	Is there any need to have localisation requirements for the system? Eg languages, keyboards			Not at the present time, there is no need too.		4
	What type of user will be using the system?			Anyone who wants to perform a type of inspection		4
	Is any training required to use the system?	- Relying on those how to be perfect at understanding to all users	- Easier and quicker to learn	Not formally	There will be a help function within the application how to perform tasks.	2

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	How will this training be implemented?			Through tutorials and help within the application.		2
	Is it important that the system is easy to use?			Yes, the system should be able to be used without too much effort.	The application should be designed in a way that it is easy to use without the need for tutorials or help.	1
<b>DOCUMENTATION</b>	What kind of documentation is required?	- Additional requirement	- Easier for maintenance - To make it easier for users to use - Ease of entry for new users	The system should have documents on why what decisions were made, what possible features could be included in future, how to use the program	Offer in app help and tutorials. Extra development documentation should be available so those maintaining the system have a better understanding.	2
	What audience is to be addressed by each document?			Users and Developers	Have them both involved as stakeholders to look at the project not only from the perspective of the	1

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					user and their requirements but how these will be carried out/executed from the developers' end.	