User Manual – Mobile App

Index

1 Introduction

Our Android-App enables the User to perform an inventory on a **per-room** basis. In our organization every item is in a room and every item is identified by a barcode. Special cases (e.g. the change of a room) will be handled *automatically* by our system.

This document describes how to use our App. This document does not describe how to use our Server-GUI – there is a separate user manual for that. Technical details will be left out in order to boost the readability of this document.

Note: Screenshots show randomly generated data only.

2 System-Requirements

Minimal System-Requirements[1]
Android 5.0 "Lollipop" as OS or a newer OS.
Needs to have a File-Browser installed. (Almost all devices have a File-Browser preinstalled.)
Needs to have a Web-Browser installed. (Almost all devices have a Web-Browser preinstalled.)
Needs to have a camera (used for scanning barcodes)

Recommended System-Requirements
Should at least be a device of the lower middle class in order to allow for a smooth experience.
Should be a Zebra[2]-Device, to maximize scanning efficiency.
Should have a strong enough battery to avoid recharging while performing an inventory.

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[1] As of today, approximately 90% of all Android-Devices fulfill these minimal requirements without any problems whatsoever.

[2] Zebra is the sponsor of this diploma thesis (see below, *3 Scanning*): https://www.zebra.com/gb/en.html

3 Scanning

Our system takes advantage of the printed barcodes on our items. There are two ways to scan a barcode:

1. Using the camera of your device. This option is available on all phones.
2. Using a Zebra-Device. This option is only available on Zebra devices with an integrated barcode scanner.

It does not matter whether you carry out the scan with the camera or the Zebra-Scanner. You have the full functionality of the app even without a Zebra-Scanner. However, the Zebra-Scanner is definitely faster.
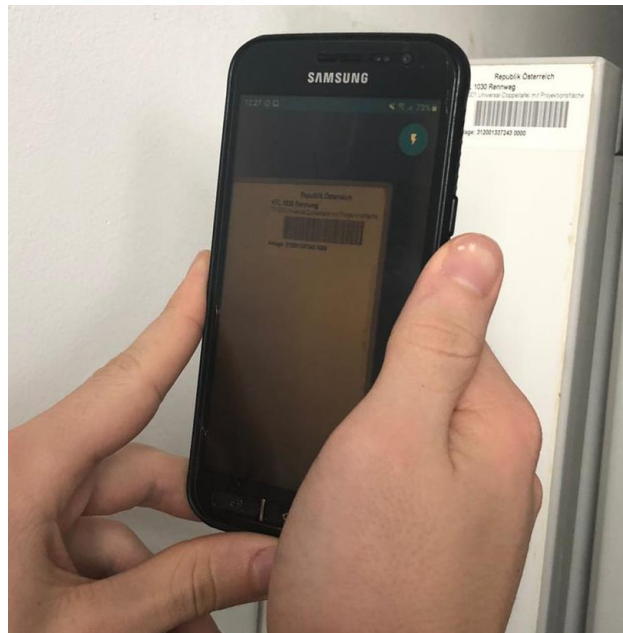

Figure 1: First Option utilizing the camera for scanning: You should keep a distance of about 8 cm between camera and barcode. You should also maintain an angle of around 90 degrees.

3.1 Zebra-Scan

Figure 2: Zebra-Scan: This scan is triggered by hardware buttons and is only available on Zebra-Devices

Figure 3: The Zebra-Scan is always triggered by pressing one of the three labeled hardware buttons. The third is on the back of the device.
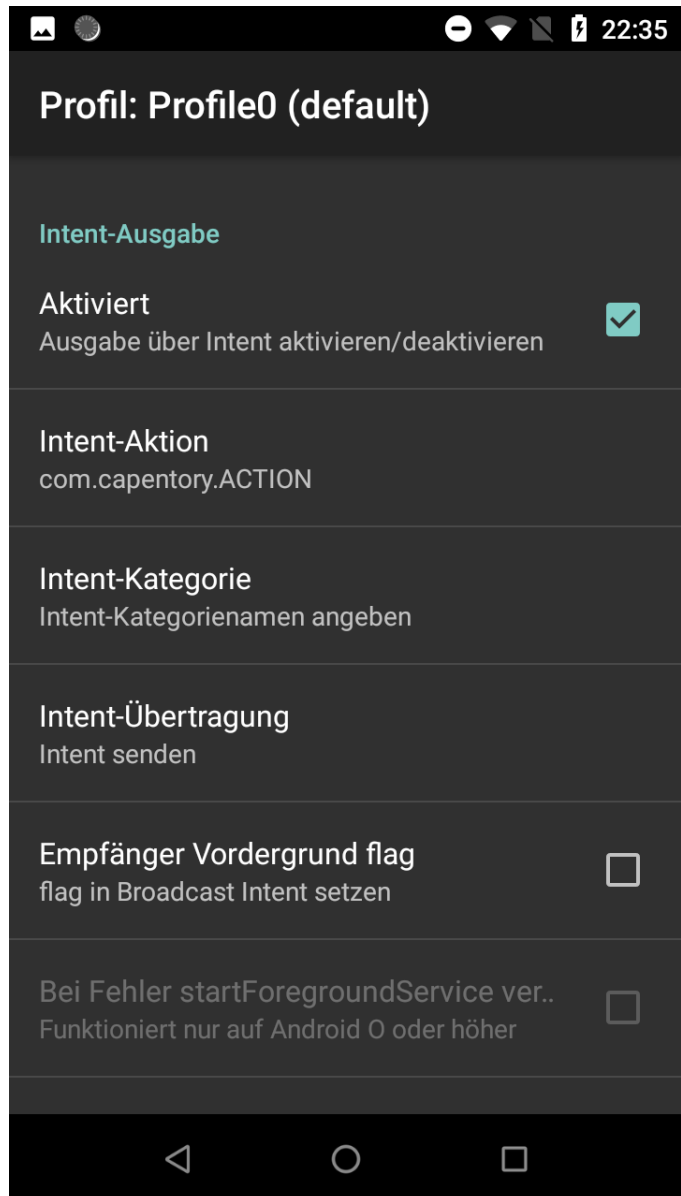

Figure 4: You must apply the following settings in the DataWedge app. The DataWedge app is preinstalled on every Zebra-Device. Our app uses an interface to the DataWedge app to obtain the result of the scan.

4 Guidelines

The App always follows these principles. If you are aware of these principles the App becomes very straightforward to use.
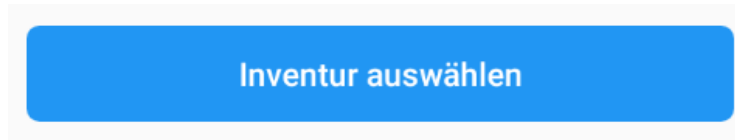

Figure 5: A blue and long button always starts the next phase of an inventory.

Figure 6: This button always initiates a camera scan. The Zebra-Scan on the other hand is always triggered via a hardware button.
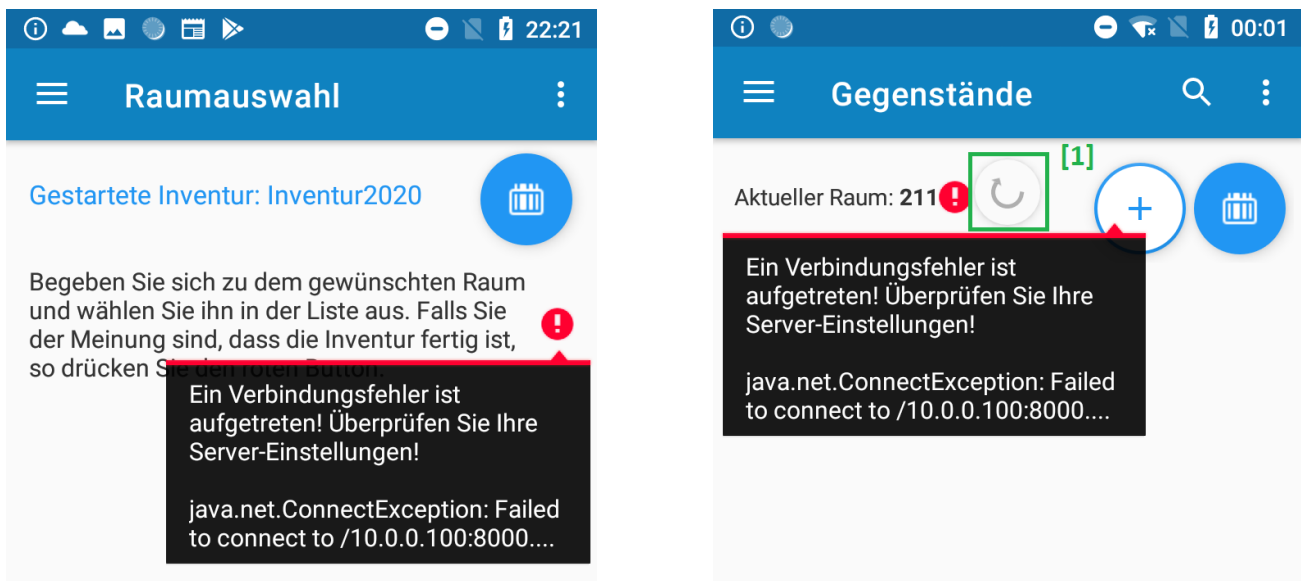

Figure 7: Acute errors are always displayed in a red-black text field. Always follow the instructions in the text box. In most cases, a bad network connection to the server is the trigger. As can be seen in [1], you can repeat a network request by swiping down (just like on YouTube when the user wants to refresh his feed).
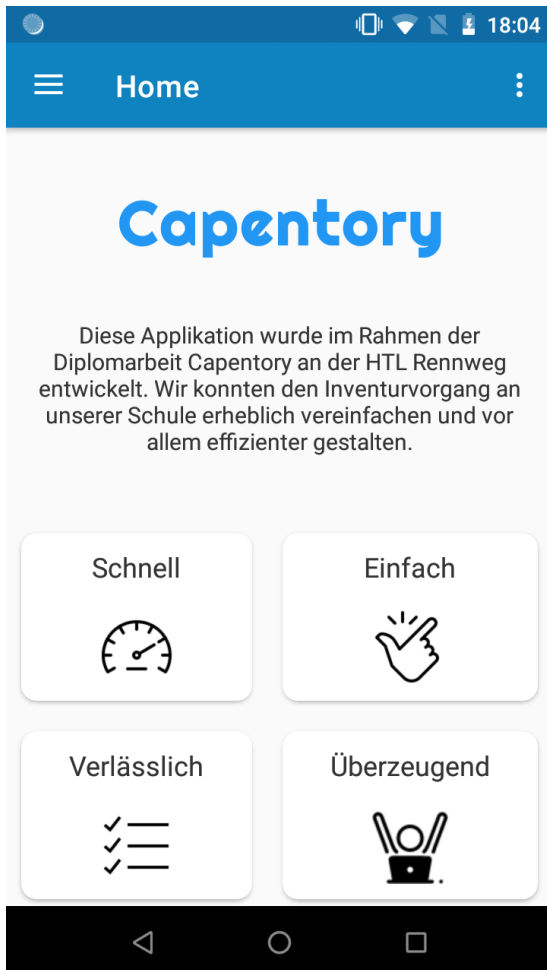
5 Inventories

5.1 Homescreen

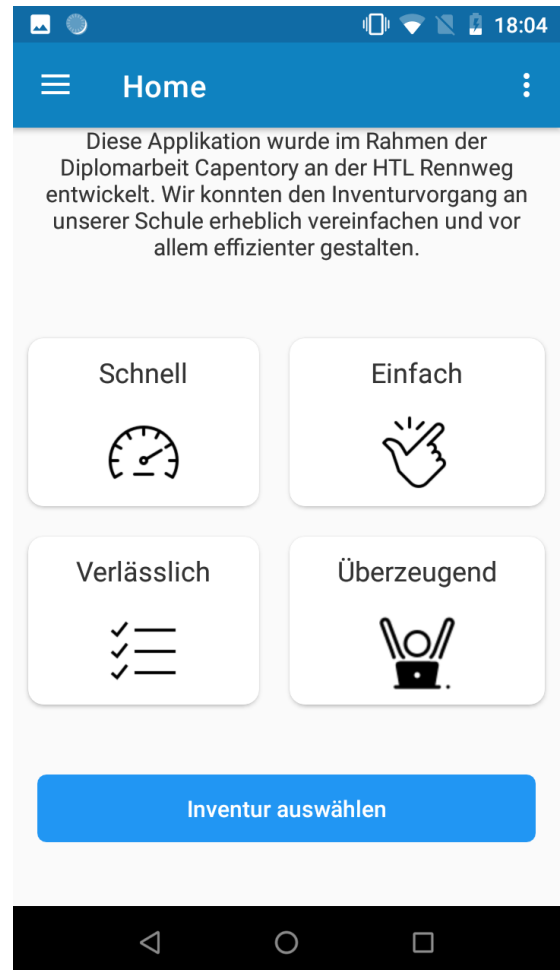Figure 8: When you start the app, you will be greeted with this screen.

Figure 9: Each screen has scroll functionalities. By scrolling down you can see the remaining elements.
The blue button lets you select an inventory that you want to work on.
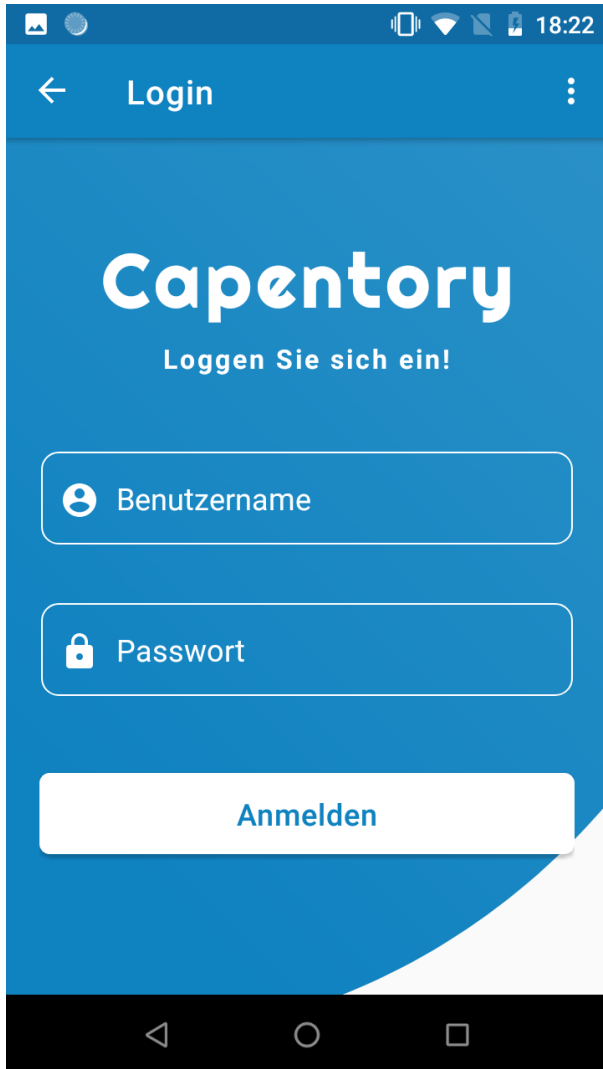
5.2 Login & Logout

Figure 10: But before actually performing an inventory you must log in first. Your username and password are never stored on the device. Only a randomly generated sequence of characters is used for authentication and is actually stored. Moreover, this random sequence is always stored in an encrypted manner.
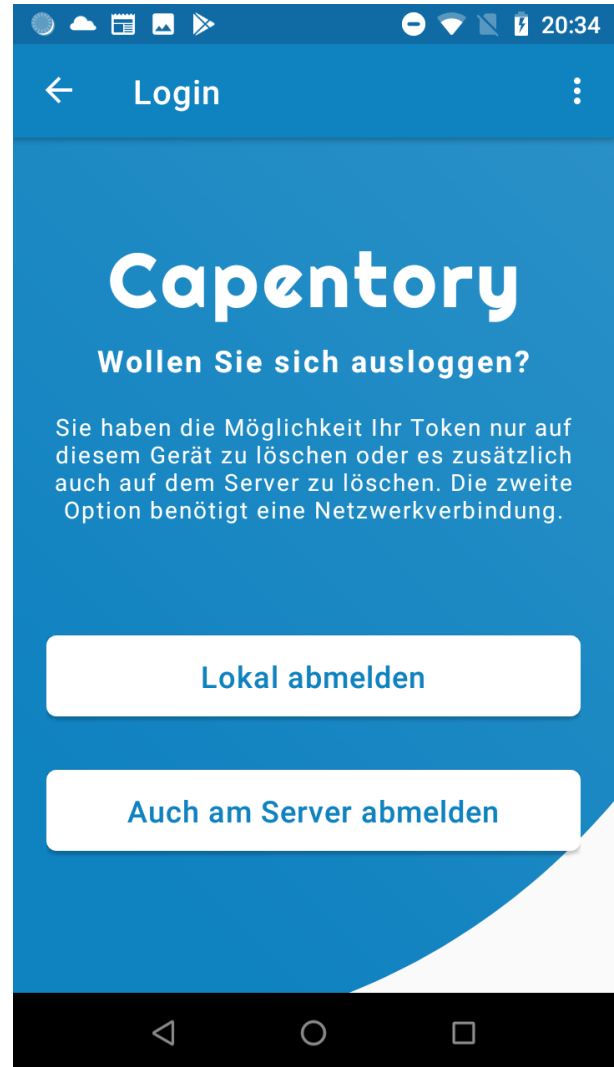

Figure 11: You can access the logout screen via the burger-button navigation. When logging out, you have the option of deleting your login data locally or deleting it additionally on the server. Most applications only offer the first option, although the second one offers a higher level of security.
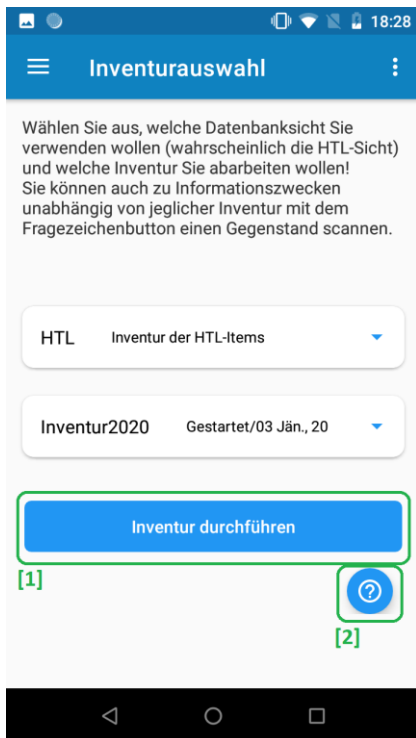
5.3 The start of an inventory

Figure 14: In this screen you must choose a database view (the HTL view will always be selected for an inventory at our school, choose the other views if you are performing an inventory for Ralph-Items). Select an inventory in the next dropdown. Inventories are created on the server by an administrator. Now you have two buttons to continue.
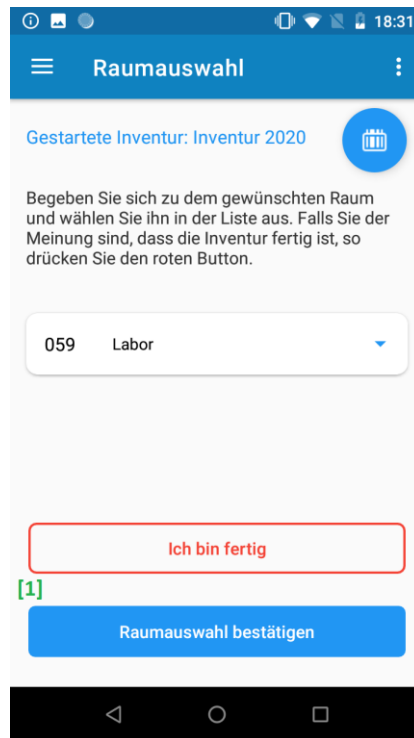
Figure 13: The long button [1] continues the inventory. In this screen you must select a room that you want to perform an inventory in. Instead of selecting the room in the dropdown list, you can alternatively scan the barcode of a room. (Directly via integrated Zebra-Scanner or via camera scan by using the round button in the top right corner)
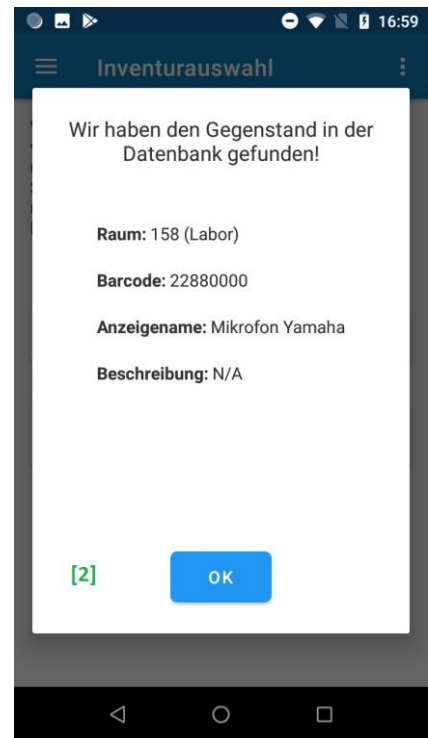
Figure 12: Button [2] allows you to scan an item for purely informational purposes regardless of an inventory.

5.4 Item validation during an inventory

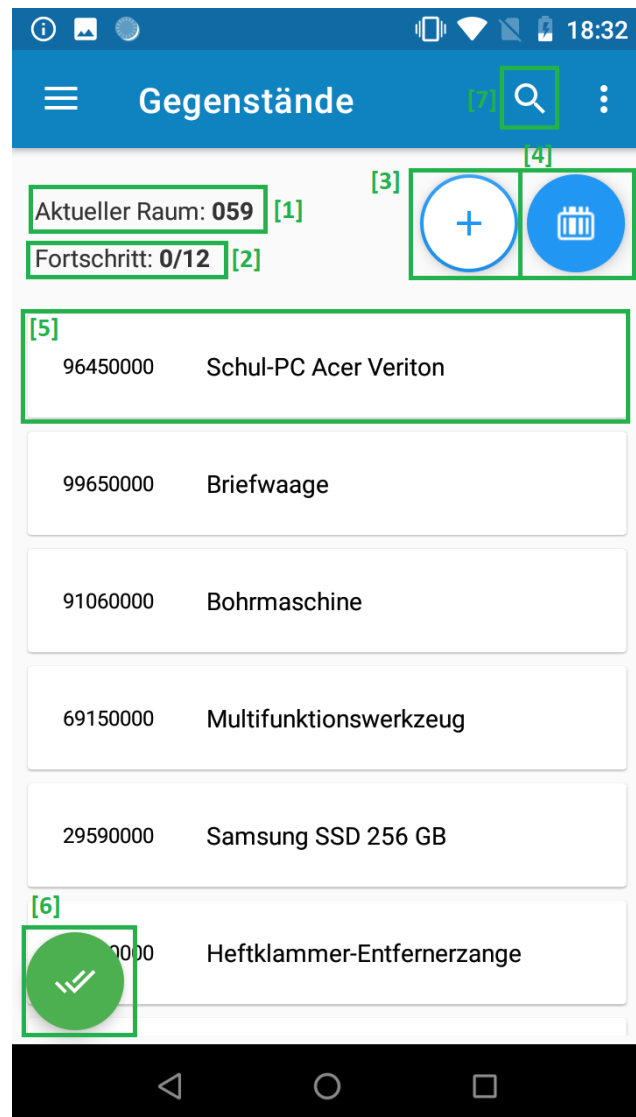| #	Function
[1]	The current room is displayed here. If you are in the wrong room, you can leave it with the familiar "<" button and discard the changes.
[2]	The current progress is displayed here. The first number describes the number of already validated items and the second the number of expected items.
[3]	With this button you can add a new item **without a barcode**.
[4]	Each item has (at least theoretically) a barcode. This button activates the camera scan, with which you can scan an item. Use the hardware buttons instead if you have a Zebra-Device.
[5]	This is an entry from the list of items for this room. It contains a barcode and an item description. Instead of scanning an item, you can simply click the item in the list. If you have validated an item, it disappears from the list.
[6]	With this button the changes you made are sent to the server. UNLESS IT IS PRESSED, NO CHANGES WILL BE MADE ON THE SERVER.
[7]	You can search for barcodes and descriptions using the search bar.

Figure 15, List of items for a room: This is the most important screen of the entire app. You validate all the items in a room one by one.
The functions of the individual components can be seen in the associated table.

| #	Function
[1]	The red button indicates that this object is NOT in this room. After pressing this button, you will return to the item list. Missing objects are marked as missing anyway when a room is closed. *Therefore, you do not have to open each missing item individually and press the red button.* However, this can give you a better overview as the list of total items becomes shorter.
[2]	The green button signals that this item is in this room and saves the changes you have made. After pressing this button, you will return to the item list. Alternatively, you can physically shake your device.
[3]	If you are unsure whether your changes are appropriate, you can set this checkbox. The administrator can then approve or reject your validation on the admin interface.
[4]	This button takes you to the attachments. An item can have any number of attachments (e.g. Pictures).
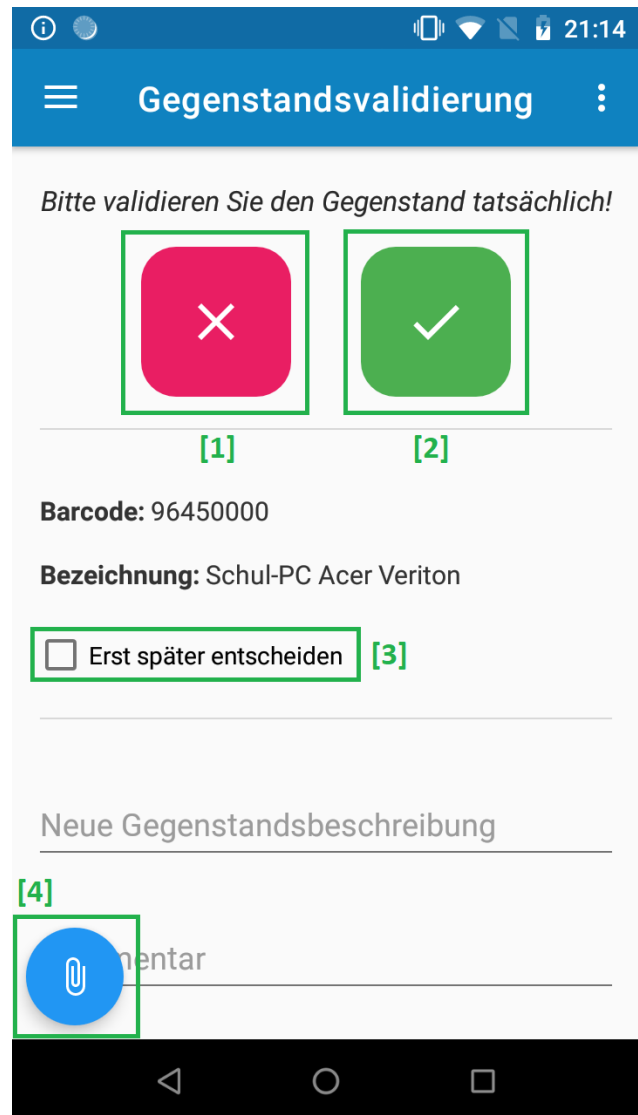
Figure 16: You get to this screen by scanning an item or clicking directly on an entry in the list. This screen is used to validate an item. For example, you can add a comment for this item. After pressing the green or red button, you will return to the item list and can validate the next item.
The functions of the individual components can be seen in the associated table.

5.4.1 Displayed Fields

All fields are fetched dynamically from the server. If you are performing an ralph-inventory you will therefore see the fields of an ralph-item (e.g. of a BackOfficeAsset). The fields that are displayed in the German version of this document will not be described.

5.4.2 Example

Your job is to scan every item you see and thus work your way through the list of items in this room - any special cases are automatically dealt with by our system. When you are finished with that room, makes sure to send your changes to the server.
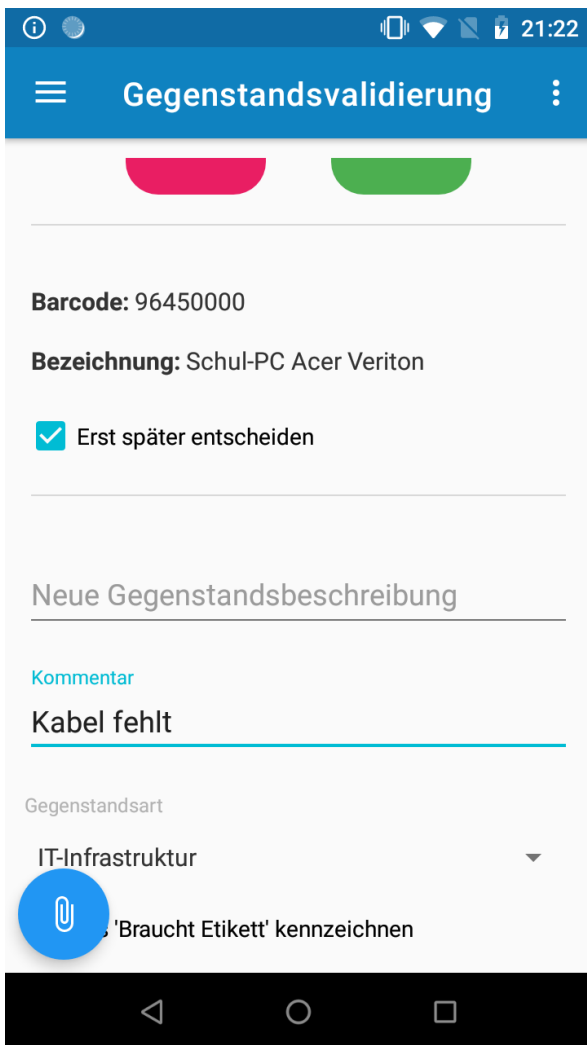

Figure 17: After validating several items, the user meets this item. As an example, the comment field is set here, but the user is unsure and also sets the checkbox "Decide later". He then validates this item with the green button and continues with the remaining items.
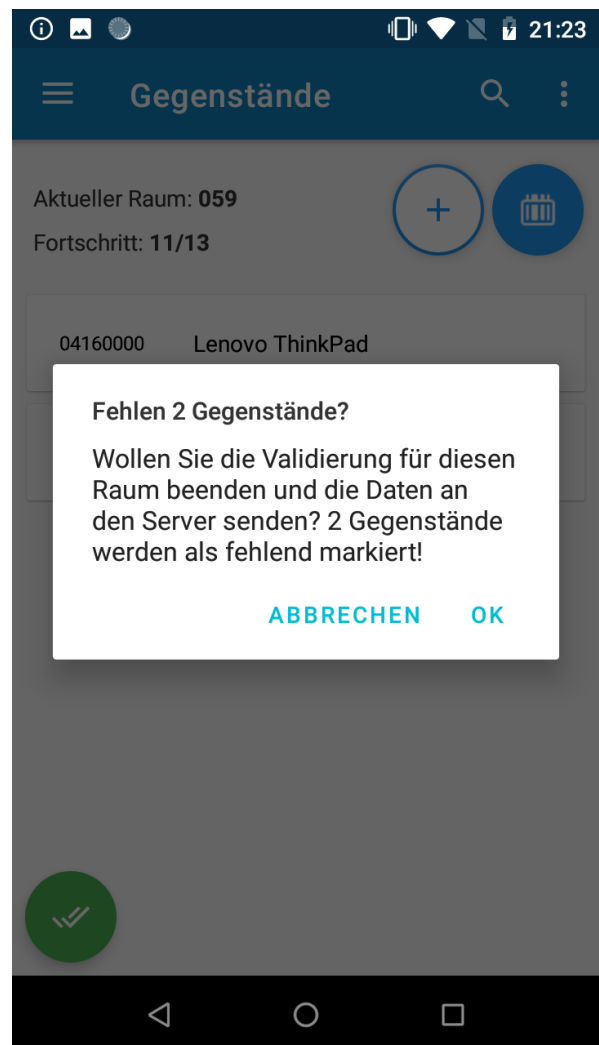

Figure 18: After validating all items, click the green button at the bottom left to send your changes to the server. In this case two items were not found. Afterwards, you can continue with the next room.

059 (Labor)

Expand all   **Collapse all**

Item	Times found	Suggested Value Changes	
Schul-PC Acer Veriton	1	**Field**	**Wert**
		Kommentar	Kabel fehlt
Briefwaage	1		
Bohrmaschine	1		
Multifunktionswerkzeug	1		
Samsung SSD 256 GB	1		
Heftklammer-Entfernerzange	1		
Glasfaserkabel	1		
Zentrierwinkel	1		
Zieheisen	1		
Maurerkelle	1		
Farbeimer SCHWARZ	1		

Items not found:

Item	Last found	Last found (prior to Inventur2020)
Lenovo ThinkPad	Never	Never
Schul-PC Toshiba	Never	Never

Figure 19: Let's take brief look at the server: Here one can see that the comment field was changed and that 2 items could not be found in this room. The gray and white markers mean that the user was not sure about a particular validation and he set the checkbox that was mentioned earlier.
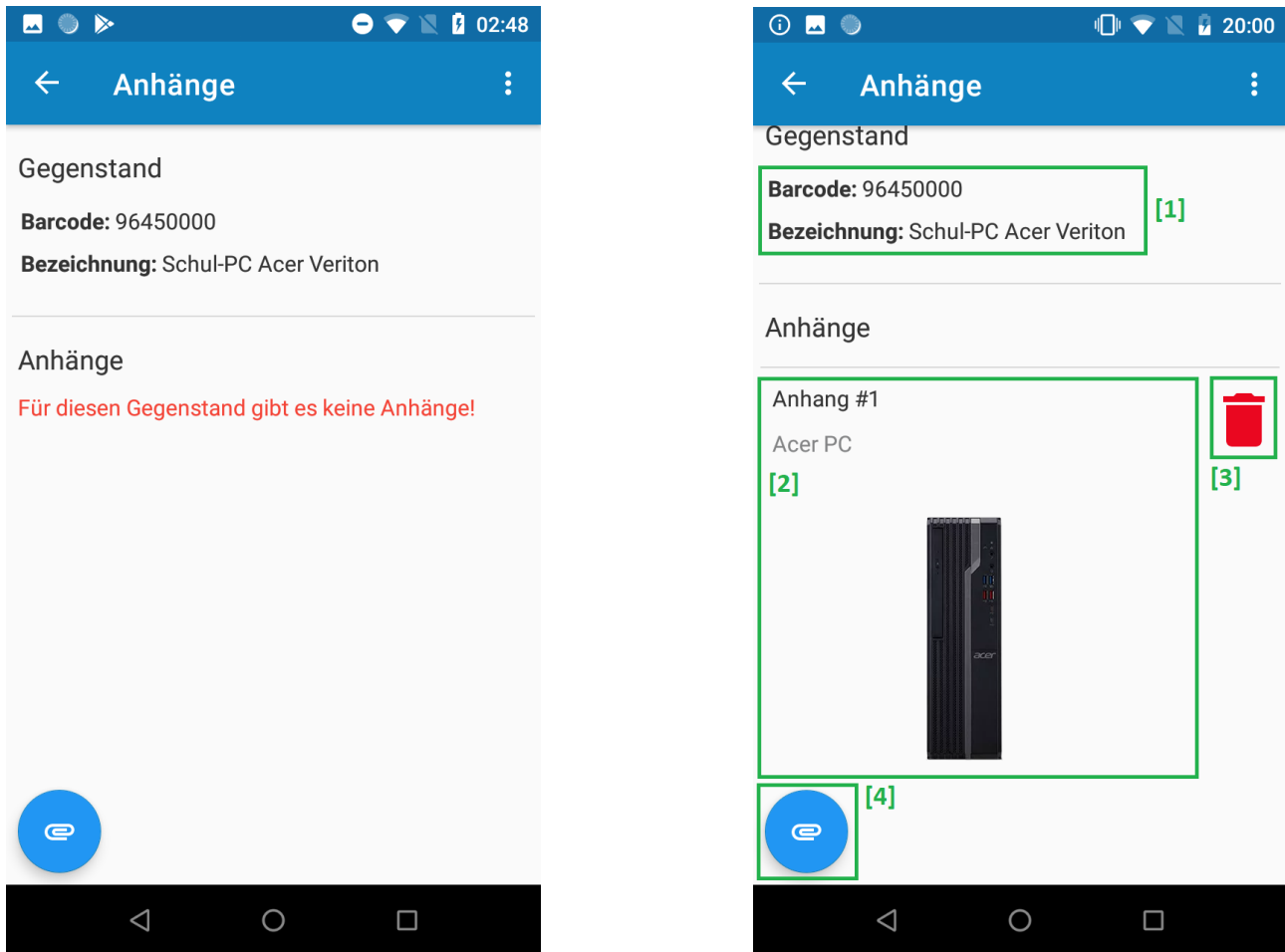
5.5 Attachments

Figure 20: You also have the option of adding an attachment to an item - e.g. an image from your gallery. (This screen is reached via the button that was described in Figure 16). If you assign the same attachment to several items, the attachment will only be saved once on the server.
The functions of the individual components can be seen in the associated table.

#	Function
[1]	The item summarized once more.
[2]	Here one can see an attachment. Images are displayed directly; other file types are displayed as download links.
[3]	You can remove an attachment with the red button.
[4]	With the blue button you can add another attachment and assign a description to the attachment.

6 Special Cases

6.1 Subrooms

We offer you the option of dividing a room into several logical subspaces either through importing them or directly through the server GUI. This enables a better overview of complex rooms. An item's subroom membership can be changed with a drop-down list.
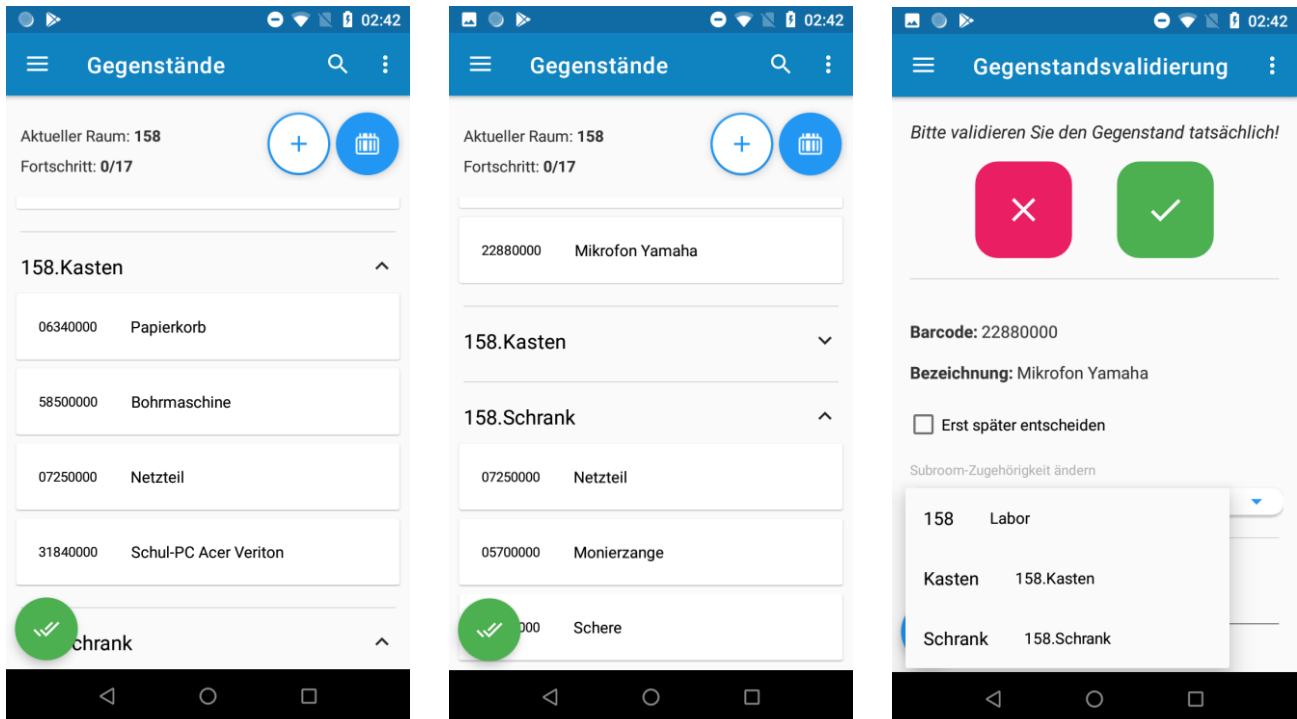

Figure 21: In this example you can see two subrooms within the room 158. Subrooms are collapsible. You can change the subroom membership on an item-basis.

6.2 Different room/ Unknown Item

If you scan an item from another room or an unknown item, your device **vibrates** to inform you. If you press the green button, our system automatically handles the steps for the change.
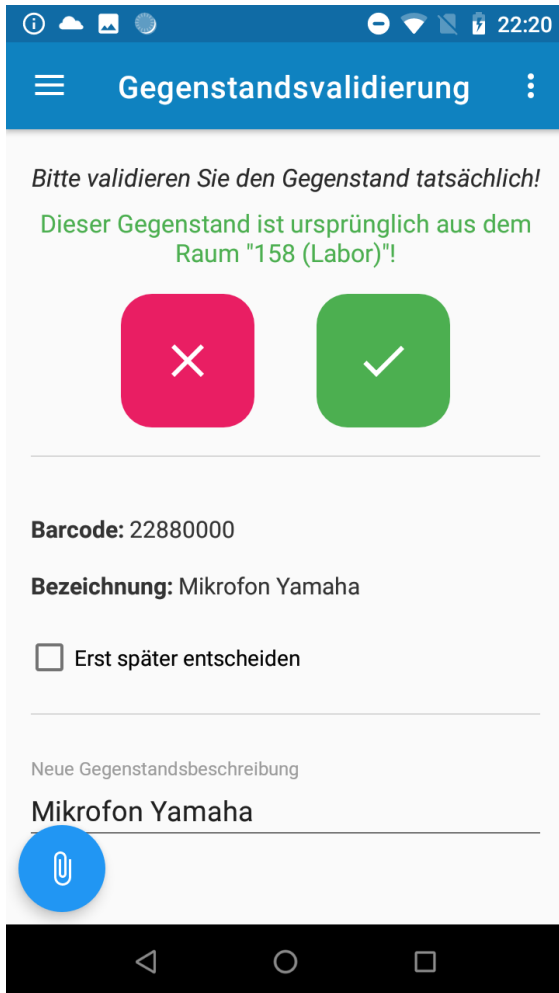

Figure 23: This item originates from the room "158". We'll take care of any changes as soon as you click the green button.
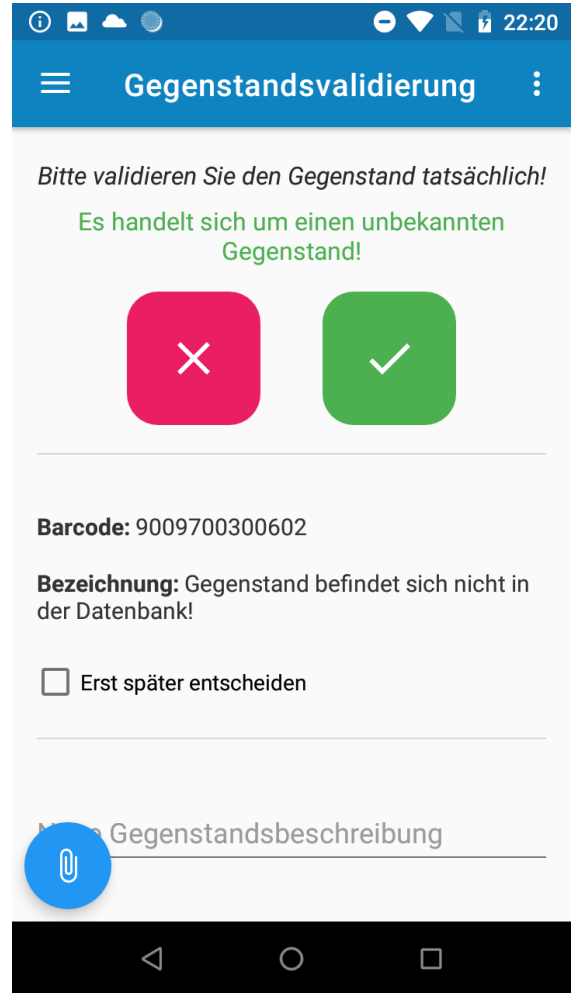

Figure 22: This item is not in our system at all. That means it has either not yet been imported or should not be imported. By pressing green button a new item is created.

6.3 Subitems

At our school it is possible that an item with a certain barcode actually consists of several physical objects. Example: A telephone bundle is entered as a single item and consequently there is only one barcode for this item, although in reality there are several phones.
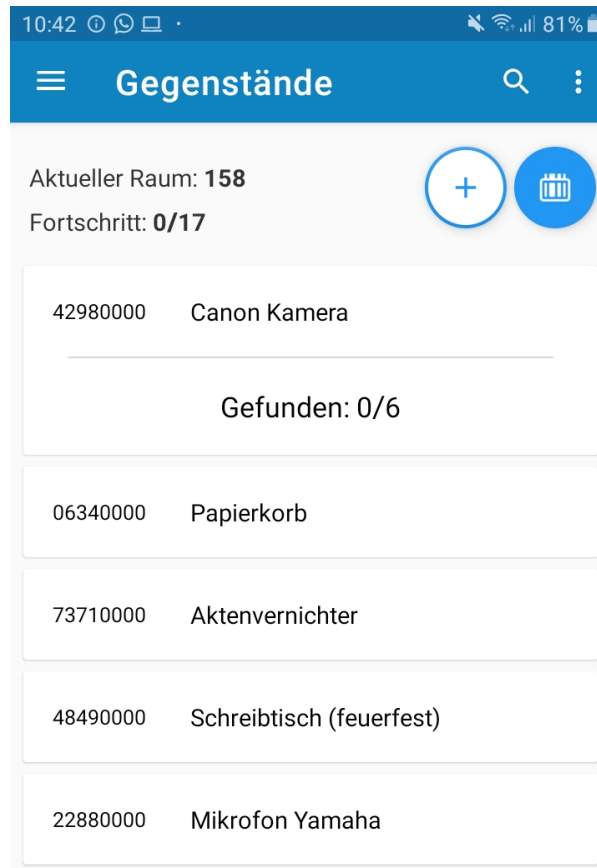
Figure 24: The Canon camera is a sub-item in this example, i.e. there should actually be 6 cameras in this room.
If you want to mark an item that consists of several physical items as a sub-item, simply scan the parent barcode as often as you find sub-items.

Warning for our School: You should only create sub-items if you are absolutely sure about it. Sub-items DON'T have their own physical barcode, which you can use to determine whether a sub-item really belongs to the parent item.

7 Settings

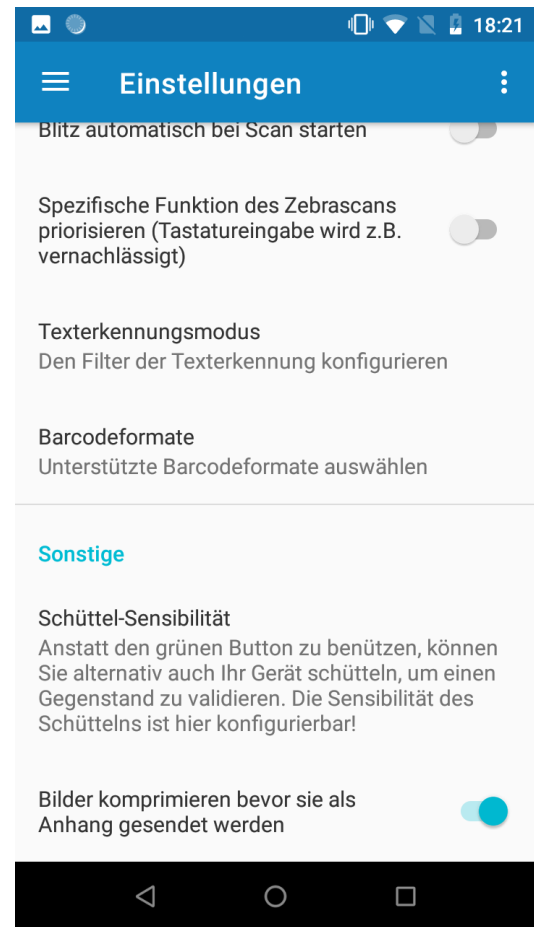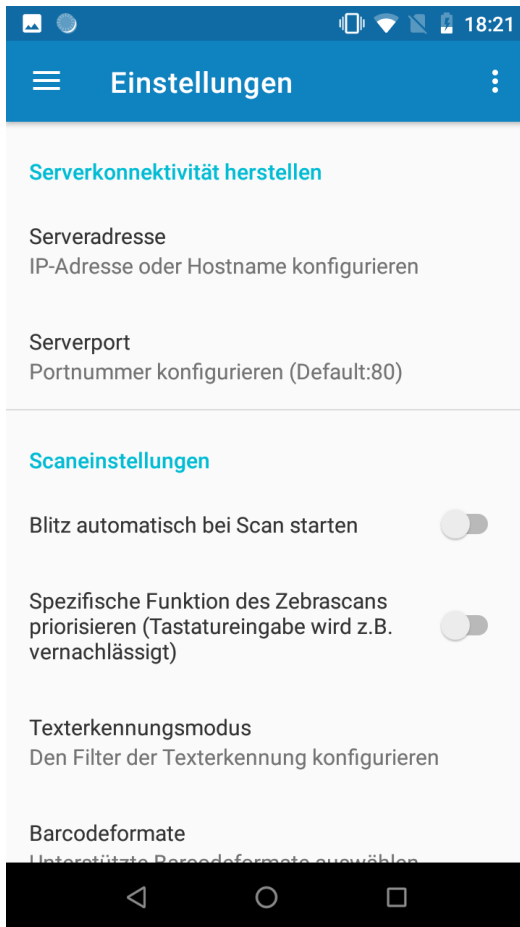Figure 25: Before you start, however, you have to check the settings on the app (accessible via the "three-point" button in the top right corner). The default settings are adapted to our school. The settings are explained in more detail in the following table.

Setting	Explanation	Suggested Value
IP-Address of the Server	Address at which the server can be reached.	*<The IP of the Server in your network>*
Port of the Server	Port number associated with the server.	*<The Port of the Server in your network>*
Auto Flash	You can scan barcodes with the camera. If you use a device with sufficient battery capacity, it is advisable to activate the camera flash immediately when starting the camera scan. This allows the camera to focus faster and the scanning time is reduced.	On
Specific function of Zebra-Scan	Simplified: If the Zebra-Scan writes to the text output, but the pop-up behaviour does not work, it is probably because the	Off (On if there are

|		
	keyboard is blocking the Zebra-Scan. To fix this, activate this setting.	problems with the popup-behaviour)
Text recognition mode	If the barcode is damaged, you have the option to scan the printed text. There are different modes for this.	Numeric (optimized for barcodes)
Barcode formats	If you don't have a Zebra-device, you can still scan barcodes using the camera scan. In order to keep the scan as fast as possible (and to avoid incorrect results), it is advisable to restrict the barcode formats.	*<The barcode format of your organization>* *(our school uses CODE_93)*
Shake-Sensibility	Instead of pressing the green button, you can alternatively shake your device to validate an item. The shaking strength required is configurable (and can be deactivated).	Sensitive
Image compression	Before images are sent as attachments, they are compressed. This keeps the file size and upload duration low. You can choose the degree of the compression yourself.	Low Compression

8 Tips & Tricks
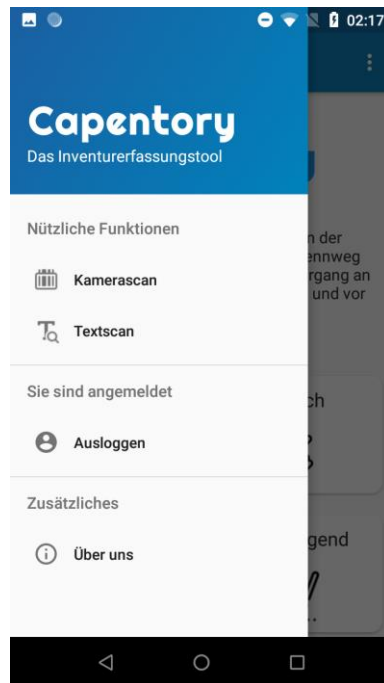
Figure 26: The burger-button navigation has no influence on an inventory. However, it hides two useful functions. A special „camera scan" and the "text scan".

Figure 27: This type of camera scan has nothing to do with an inventory. It only copies the scanned code to your clipboard and shows you the barcode format (regardless of set restrictions in the settings). This can be useful to make the correct settings for the barcode formats.

Figure 28: What do you do if a barcode is damaged? The app offers you the possibility to scan the printed text. With the setting "numerical" you can optimize the scanner for character strings that are similar to barcodes. After a certain period of time, the scanner locks and you can copy the text safely to your clipboard.

Wurde mit 8GB erweitert

Figure 29: Another useful trick: You can print out a message beforehand as a QR code and save yourself the typing. With the special camera scan you can copy this text to the clipboard. With the Zebra-Scan you can even immediately write to any text field. (The Zebra scan also writes to the keyboard by default)
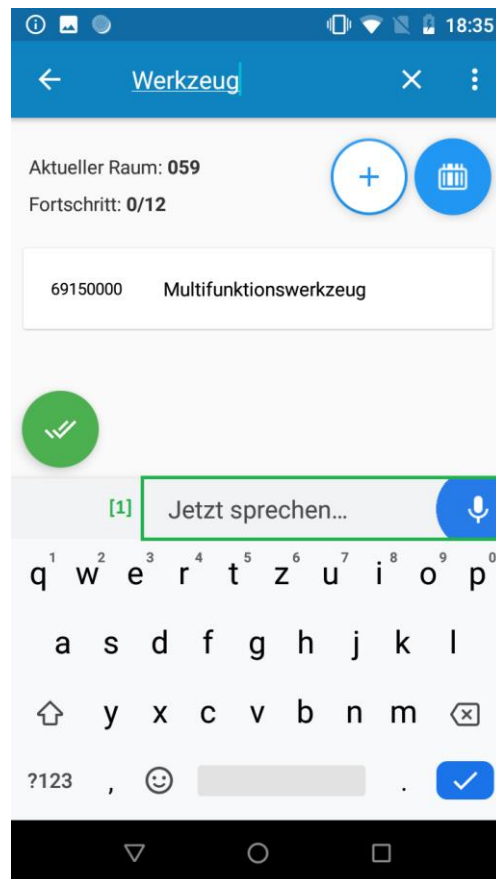

Figure 30: Most Android devices also offer VoiceToText functionalities integrated with the standard keyboard [1]. You can use this to search for an item conveniently with your voice like in this screenshot.

8.1 Additional tips

1. If you perform an inventory in a room with poor internet reception, it makes sense to open the item list before entering said room. As long as you do not come across any itemt that does not belong in this room, you do not need an internet connection to work through the entire room. To send the changes to the server, just leave the room and go to a location with better internet.

2. Instead of having to press the green button from Figure 16 every time, you can alternatively shake your device. You can therefore already go to the next item and don't have to look at the screen to validate the current item. You don't need to be afraid of a potential special case. If a special case occurs, your device vibrates and thus warns you. If an error occurs, the validation is blocked anyway.

3. You should carry out a camera scan at a square angle while keeping a distance of ca. 8 cm to the barcode. If you have enough battery, you can use the flash.
When using the flash, be careful not to make the barcode unreadable with the flash. Therefore, hold the camera slightly higher than the barcode. Speaking of settings, limit the barcode formats to those that you really need. This makes the scan more reliable and, above all, faster.

4. As soon as you finish a room, all changes are sent to the server. You can then close the app. As long as you don't close the app while you are validating a room, no data will be lost.

5. If the app appears slower, you can restart it after finishing a room. Android apps tend to slow down the longer you use them.

6. A power bank is certainly not a bad idea if you plan to perform an inventory for several hours.

7. If you have little storage space on your device, you can delete the app data without risk - only your settings will be lost, and you will have to log in again afterwards.
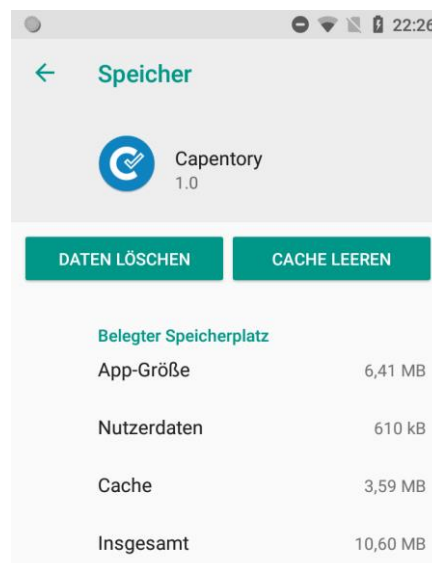

Figure 31: The app does a lot of caching in the background to keep network latencies as low as possible. You can empty the cache after an inventory.

8. The "Decide later"-checkbox should not be used for every triviality. Otherwise, the administrator has an unnecessary amount of work on the server.

9. If an error occurs, it is in most cases due to a poor connection to the server. Go to a location with better internet.

10. The Android setting "rotate screen" will probably bother you while working. Use the portrait mode instead.

11. Do not just stand around while the app loads data. Use the loading times of network requests to go to the next item or room (if possible).

12. You can use the app in the split-screen view. Hence, you can use another app at the same time (e.g. listen to music)

Have Fun Performing your Inventory with Capentory!