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Graduate and Extended Studies

CMPE 277 – Smartphone Application Development

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Smart Scan App

Text recognition technically known as optical character recognition (OCR) and can be really useful when we want a paper document to be saved in digital, editable form. You need a scanner to create an image of the document first, but then once you have that image you can run it through an OCR application that will read each character and attempt to recreate the original document as text. In most cases it will never be perfect, but with a high-quality scan you can come pretty close. This is even possible on your phone, and that's why we're looking at text recognition apps. Things to keep in mind before using this app

- *Images must be sharp with good lighting.*
- *The app cannot read handwriting.*
- *Text must be black on a white background.*
- *Extracts text from paper documents, business cards and digital images.*

Features

- *Convert an image to text.*
- *Use text in other apps.*
- *Convert the scanned page to PDF and word document.*
- *Copy text to clipboard.*
- *Built-in CropImageActivity.*
- *Set cropping image as Bitmap, Resource or Android URI (Gallery, Camera, Dropbox, etc.).*
- *Image rotation/flipping during cropping.*
- *Auto zoom-in/out to relevant cropping area.*
- *Auto rotate bitmap by image Exif data.*
- *Set result image min/max limits in pixels.*
- *Set initial crop window size/location.*

Architecture of the App

Using Activity

1. *Include the library*

```
dependencies {  
  
    api 'com.theartofdev.edmodo:android-image-cropper:2.7.0'  
  
}
```

2. *Add permissions to manifest*

```
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>  
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
```

3. *Add CropImageActivity into your AndroidManifest.xml*

```
<activity android:name="com.theartofdev.edmodo.cropper.CropImageActivity"  
    android:theme="@style/Base.Theme.AppCompat"/>
```

4. *Start CropImageActivity using builder pattern from your activity*

```
// start picker to get image for cropping and then use the image in cropping activity  
CropImage.activity()  
    .setGuidelines(CropImageView.Guidelines.ON)  
    .start(this);  
  
// start cropping activity for pre-acquired image saved on the device  
CropImage.activity(imageUri)  
    .start(this);  
CropImage.activity()  
    .start(getContext(), this);
```

5. *Override onActivityResult method in your activity to get crop result*

```
@Override  
public void onActivityResult(int requestCode, int resultCode, Intent data) {  
    if (requestCode == CropImage.CROP_IMAGE_ACTIVITY_REQUEST_CODE) {  
        CropImage.ActivityResult result = CropImage.getActivityResult(data);  
        if (resultCode == RESULT_OK) {  
            Uri resultUri = result.getUri();  
        } else if (resultCode == CropImage.CROP_IMAGE_ACTIVITY_RESULT_ERROR_CODE) {  
            Exception error = result.getError();  
        }  
    }  
}
```

```
}
}
```

6. Build textrecognizer using google vision API('com.google.android.gms:play-services-vision:15.0.1')

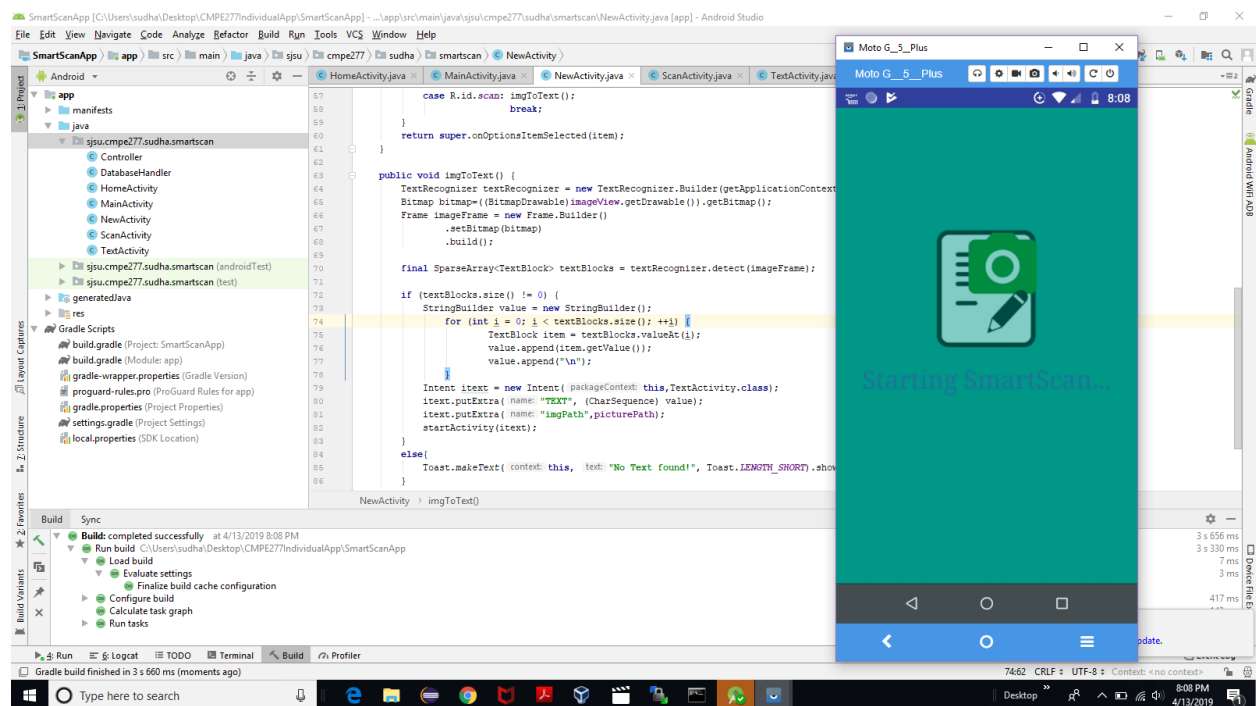
```
TextRecognizer textRecognizer = new TextRecognizer.Builder(getApplicationContext()).build();
Bitmap bitmap=((BitmapDrawable)imageView.getDrawable()).getBitmap();
Frame imageFrame = new Frame.Builder()// subscribe to async event
.setBitmap(bitmap)
.build();
```

```
final SparseArray<TextBlock> textBlocks = textRecognizer.detect(imageFrame);
```

```
if (textBlocks.size() != 0) {
    StringBuilder value = new StringBuilder();
    for (int i = 0; i < textBlocks.size(); ++i)
    {
        //extract scanned text blocks here
        TextBlock item = textBlocks.valueAt(i);
        value.append(item.getValue());
        value.append("\n");
    }
}
```

Screenshots:

Starting SmartScan App



Click on the button to select images from gallery or take a picture from camera.

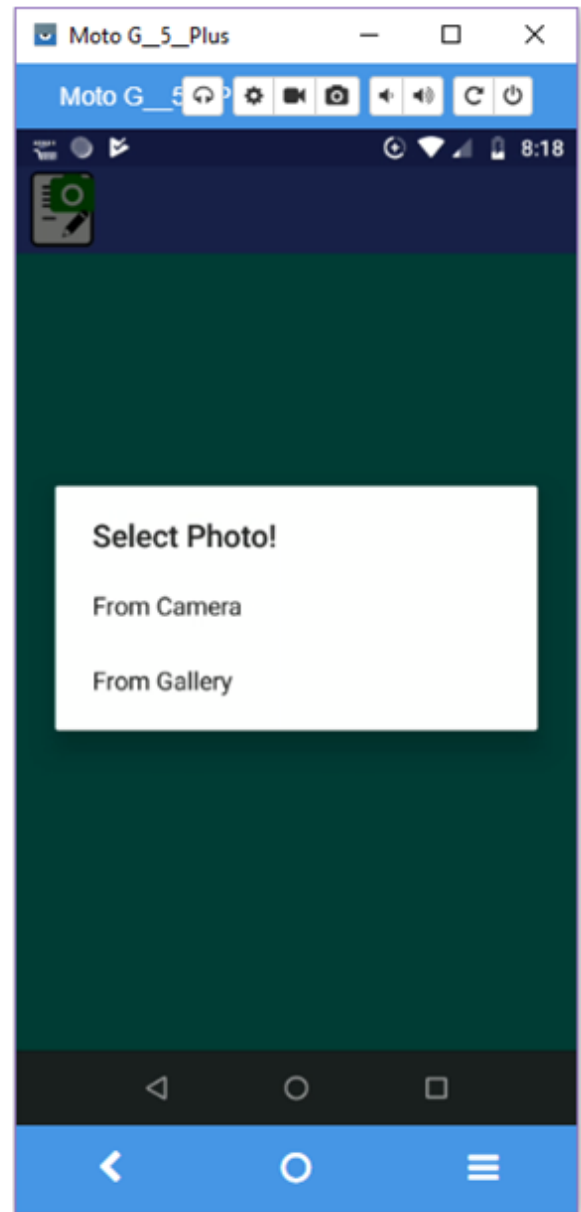
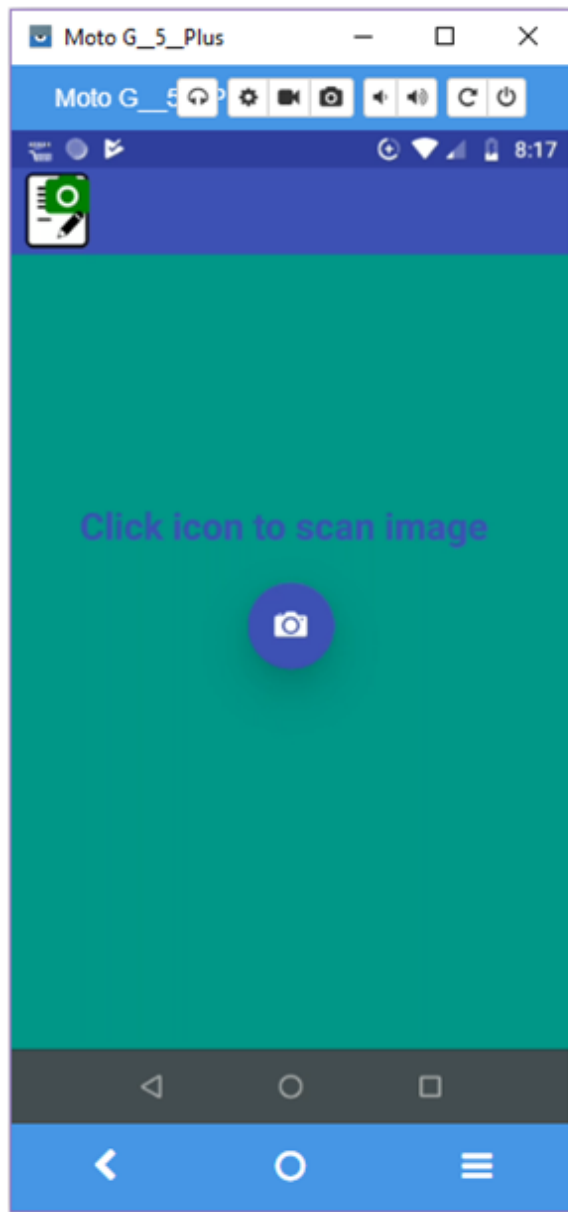
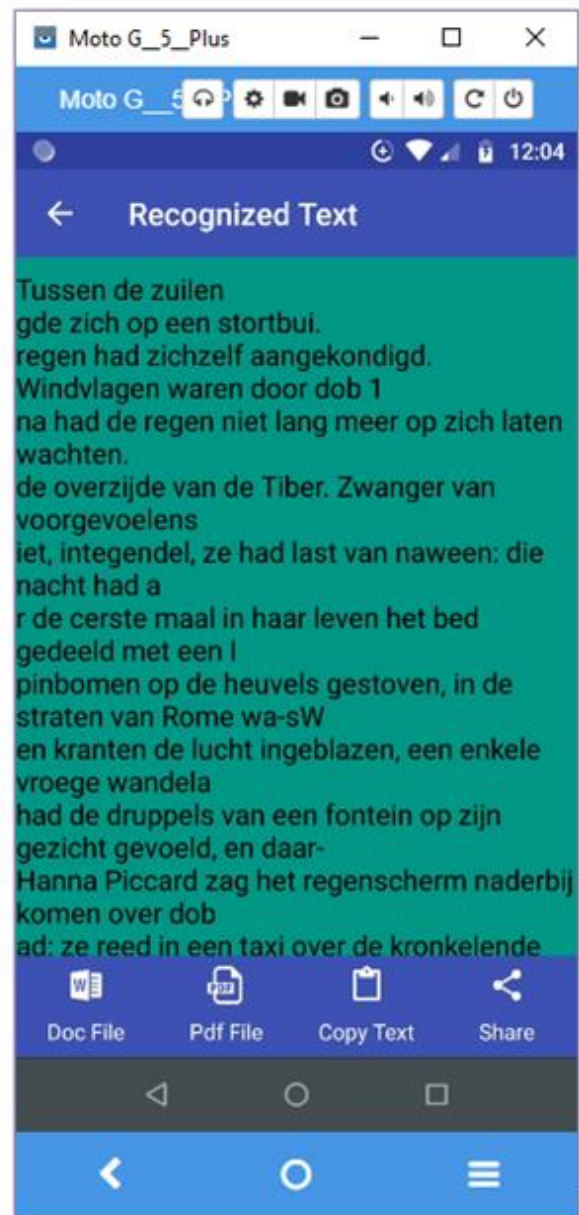


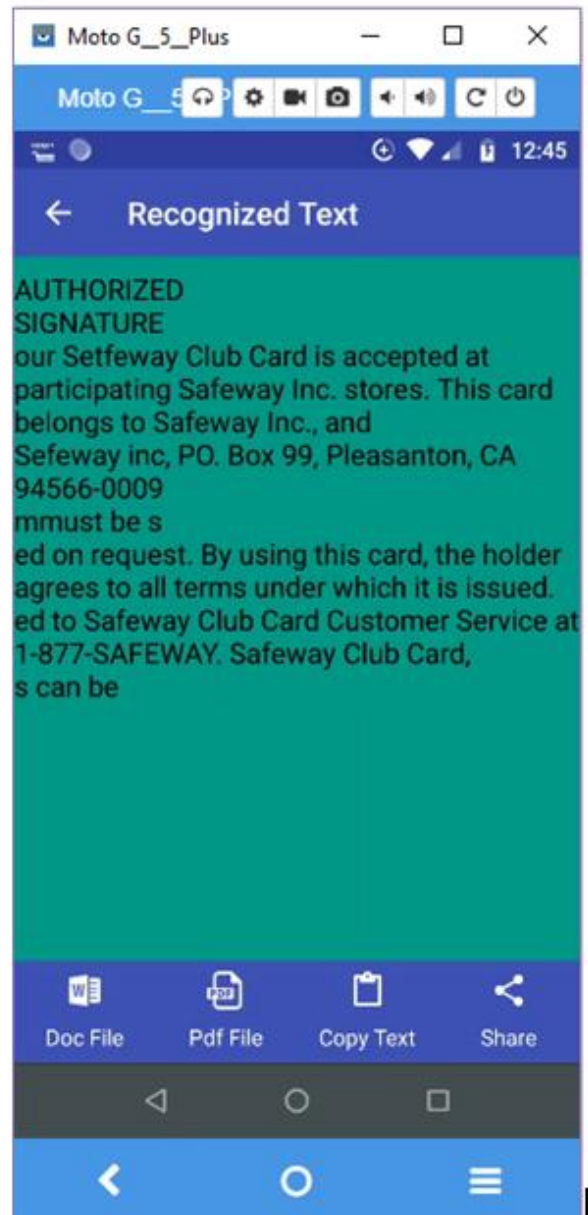
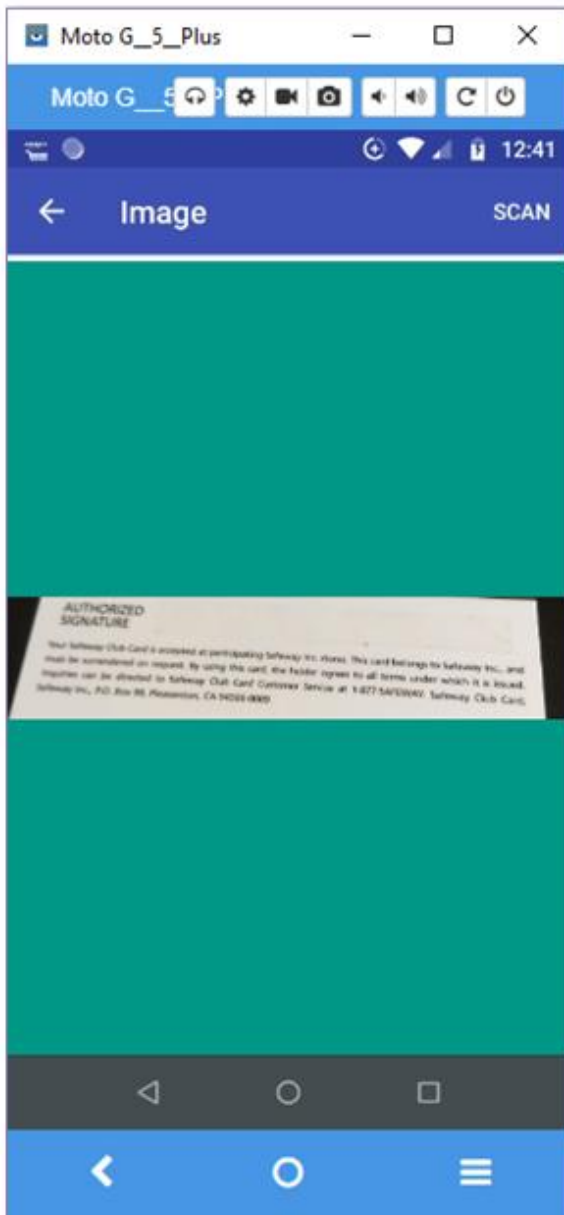
Image selected from gallery and cropped to select an area that needs to be scanned.



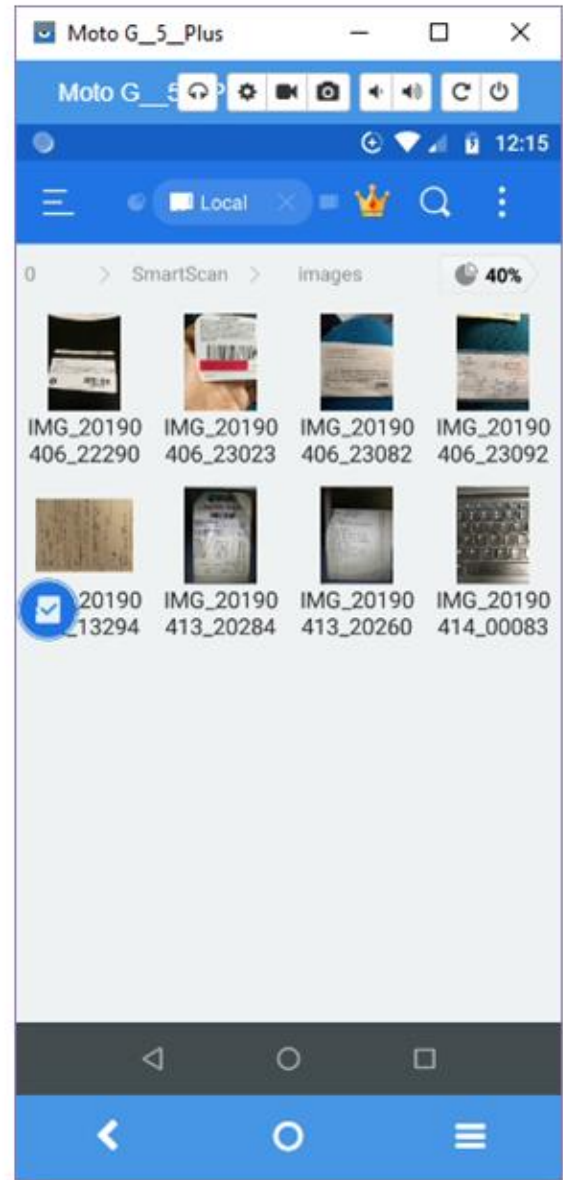
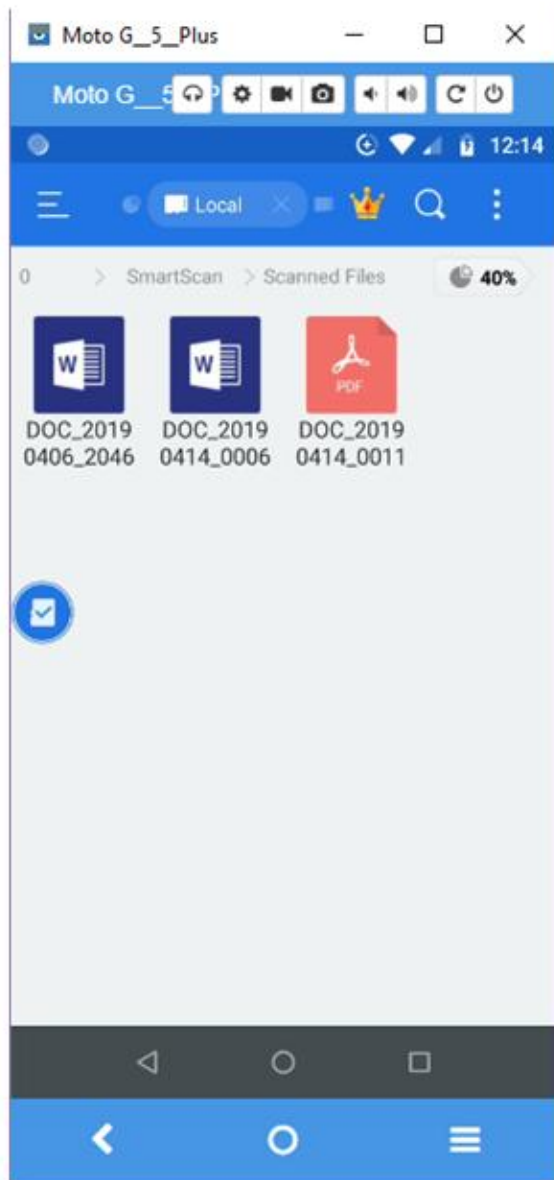
Text in the cropped digital image has been scanned to editable text. There are options to save the text in pdf format, word format, copy the scanned text and save it or share the text directly with other apps.



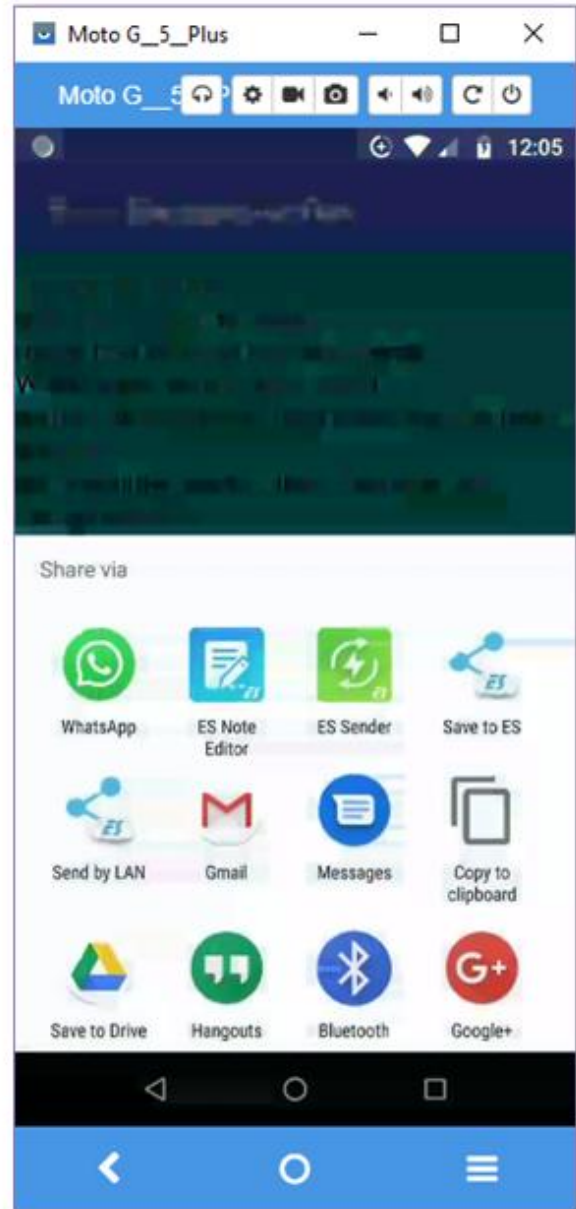
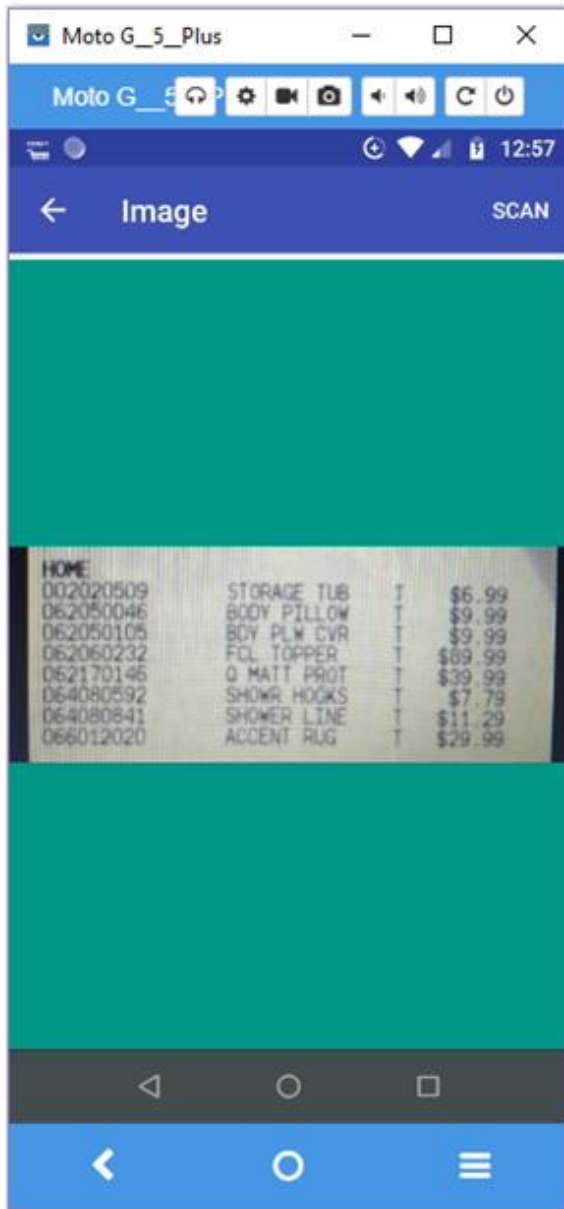
Scanned image from a shopping card.



SmartScan folder created in the local storage which has scanned files where pdf's and word_doc files are stored and Images that has been scanned from SmartScan app.



The scanned image can be shared with number of apps in the phone as shown below.



Scanned text can be saved just as is or can be edited and saved in other apps, also can be emailed or shared through other apps.

