

Prinet Mobile Application

CAPSTONE PROJECT PRESENTATION

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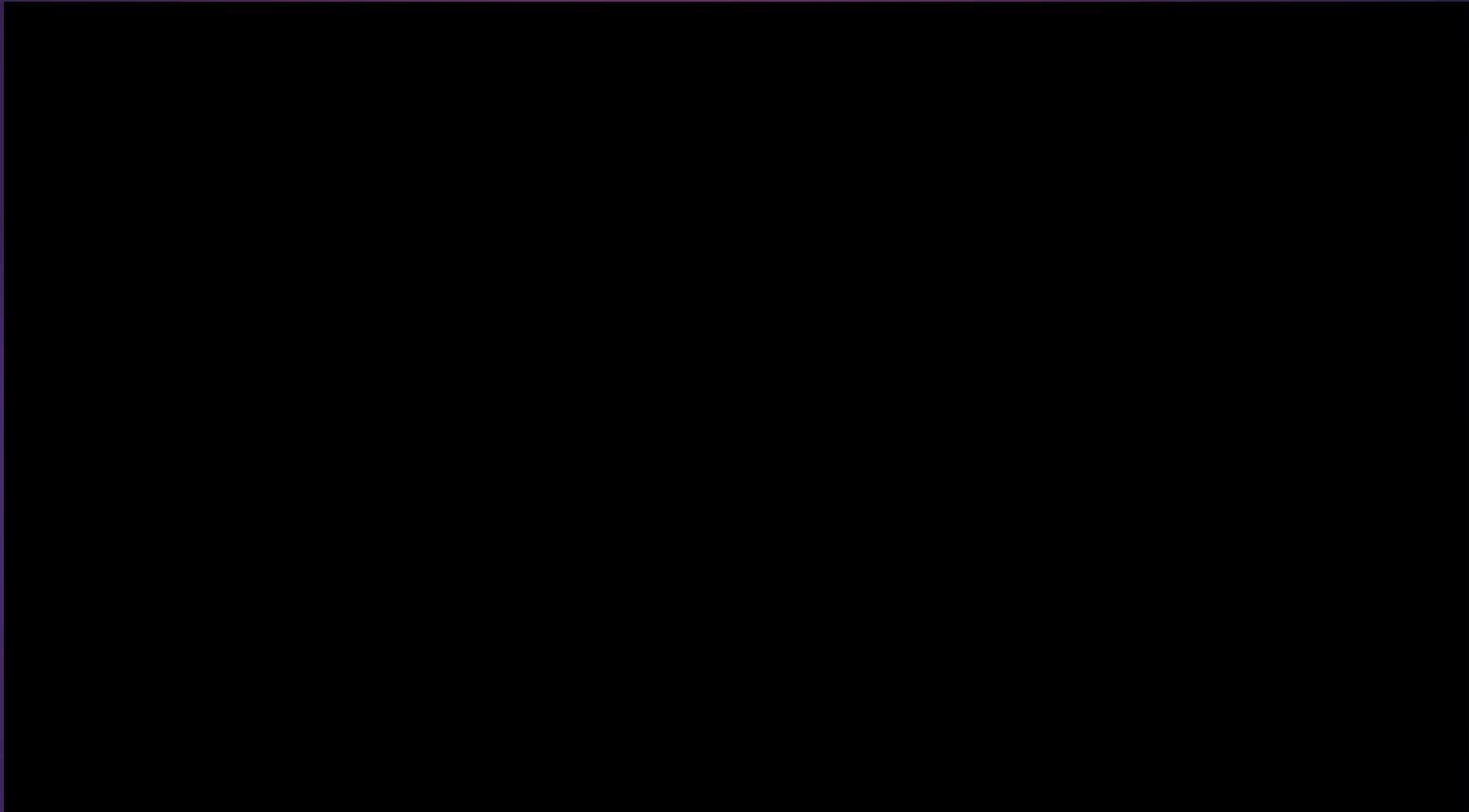
OUTLINE

- ▶ 1. Overview
- ▶ 2. Project Management
- ▶ 3. Requirement Specification
- ▶ 4. Software Design
- ▶ 5. Implementation
- ▶ 6. Quality Control
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- ▶ 8. Demo
- ▶ 9. Q&A

1. Overview

PRINET MOBILE APPLICATION

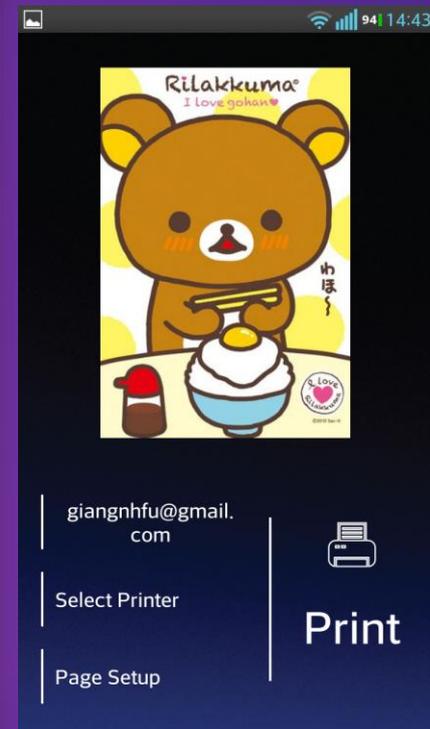
1.1 Google Cloud Print Overview



1.2 Our proposal

Create a mobile application that:

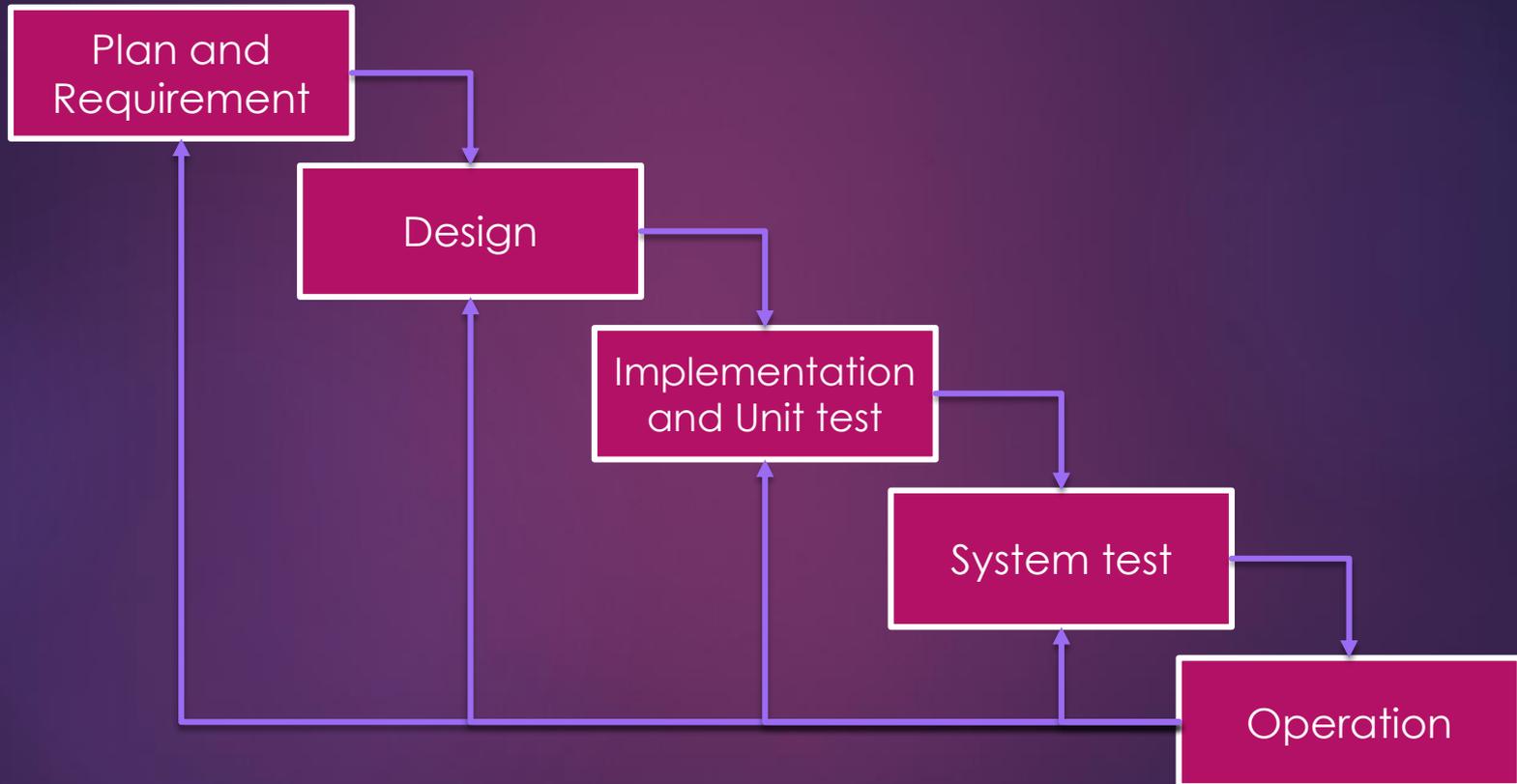
- ▶ *Provide a simple picture editing tool with some functions like free hand-drawing, rotate, crop, add symbols, set layout or add effects (color filter).*
- ▶ *Allow user to choose the registered printer and print the chosen picture over the internet through Google Cloud Print's service.*
- ▶ *Be available in 3 languages: English, Japanese and Vietnamese.*



2. Project Management

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2.1 Software Project Life-cycle



2.2 Project Schedule

	Work items	Duration	1/6/2014 – 4/26/2014															
			W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16
Plan and Requirement	Create project plan. Determine project requirements, building requirements specification document	W1 1/6/2014 – 1/12/2014	█			█	█											
Design	Building design documents: Architecture design, detail design	W2 – W3 1/13/2014 – 1/26/2014		█	█	█	█											
	Building test plan & test case	W3 – W6 1/20/2014 – 2/12/2014			█	█	█	█										
Implementation and Unit test	Developing	W6 – W12 2/13/2014 – 3/30/2014				█	█	█	█	█	█	█	█					
System test	Executing System testing, fix bug	W13 – W14 3/31/2014 – 4/13/2014				█	█							█	█			
Operation	Release software package Create user manual, installation guide	W15 4/14/2014 – 4/17/2014				█	█									█		
	Capstone Project Defense Preparation Capstone Project Defense	W15 – W16 4/18/2014 – 4/26/2014				█	█										█	█

█ Working week

█ Non-working week
(Tet holiday)

2.4 Project Organization



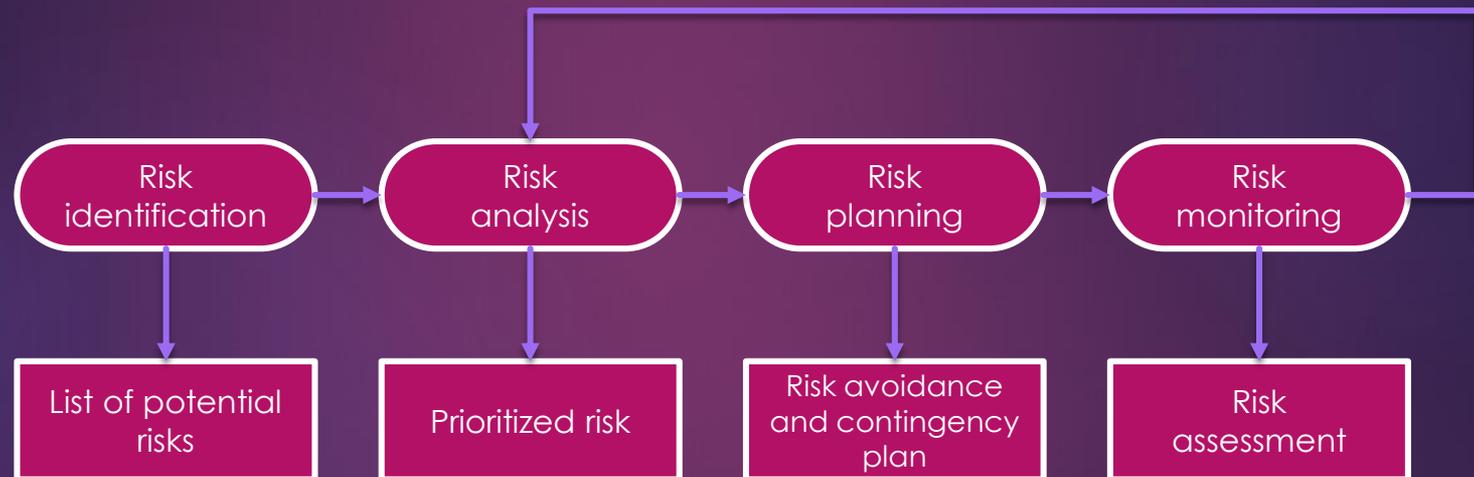
2.5 Communication Management

- ▶ Kick-off meeting 1/6/2014
- ▶ Working face-to-face: 1h30pm – 5h30pm every Monday, Wednesday and Friday at home
- ▶ Meeting with supervisor: once a week
- ▶ Communication tools:
 - Status report/Work assign: **Email**
 - Raise issue/Request support/Discussion: **Email, Phone, Skype**
 - Transfer/Sharing of project documentation or information: **Tortoise SVN**



2.6 Risk Management

2.6.1 Risk Management Process



2.6 Risk Management

2.6.2 Risk/Issue List

Risk ID	Description	Avoidance plan	Contingency plan	Probability	Impact	Status
1	Time: Study schedule may be changed during executing time	- Define constraints and discuss with the university before the semester starts	- Request a meeting with the university - Change the project plan	Low	High	Activated/ Solved
2	Time: Project duration may be requested to cut down by the University/FPT Software Co.	- Define assumptions and request the university and the company to confirm about the duration	- Request to decrease the scope of the project - Change the project plan	Low	High	Activated/ Solved
3	Retention: Some teammates might leave the project before it is completed	- The project manager will discuss with all teammate about the meanings and costs of the project to each one's life - Commitment - Assign tasks appropriately - Organize teambuilding meetings weekly	- Persuade the teammates to stay - Re-organize the project structure - Review the whole project and re-plan (in order to reduce the project scope)	Low	High	Not yet active
4	Supervisor: he may not support the team (must go onsite, have accident, sick...)	- Keep in touch to get his working status updated - Organize weekly meetings with him - Inform before leaving 2 weeks ahead	- Ask supervisor for supporter - Organize a review meeting with a new supporter - Keep contact with supervisor	Medium	High	Activated/ Solved
5	Conflicting between team members	- Hold team building frequently	- PM must find the root cause and help to solve conflict between individuals	Medium	Medium	Not yet active

2.7 Quality Management

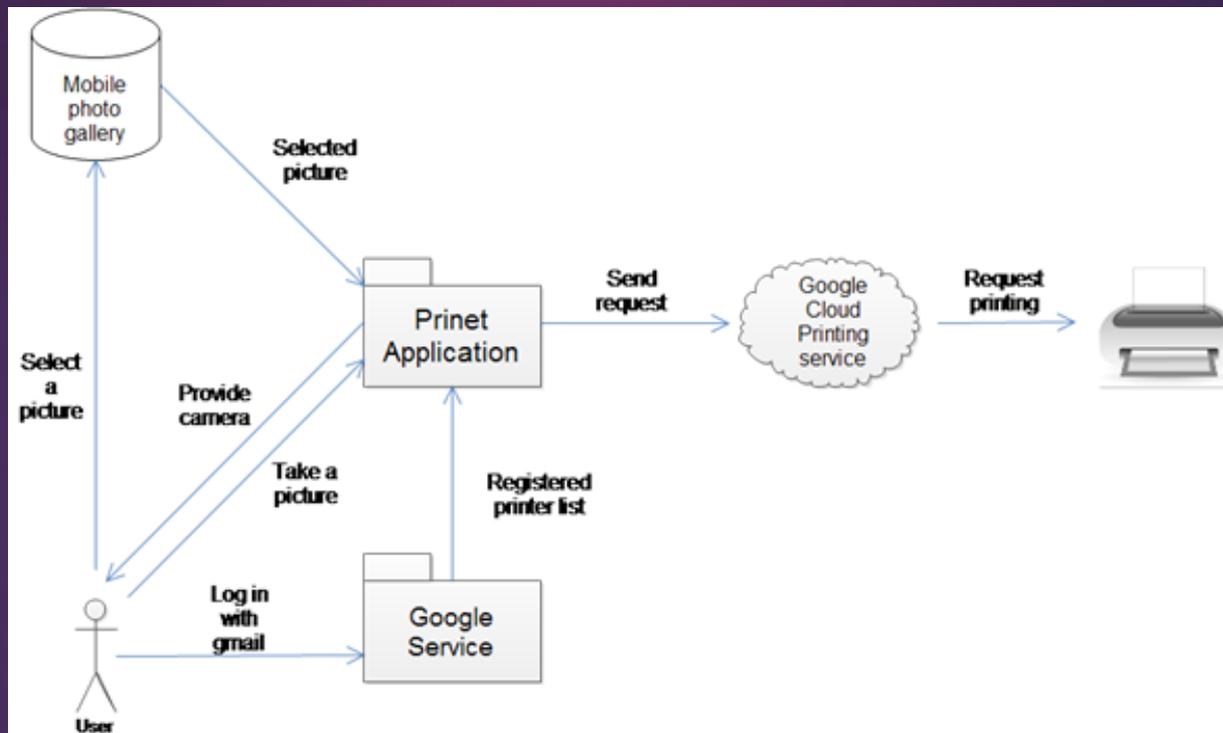
► Review Strategy

Review Item	Reviewer	Review Type	Review Method	Completion Criteria
Project plan Project schedule CM Plan	PM, Supervisor	Group review Group review One-person review	Checklist project planning review	Pass checklist review or Supervisor approve
Business analysis and requirements specification document	PM, PTL, Supervisor	Group review	Checklist SRS review	Pass checklist review or Supervisor approve
Design document	PM, PTL, Supervisor	Group review	Checklist Design review	Pass checklist review or Supervisor approve
Stage plans	PM, Supervisor	One-person review		Pass checklist review or Supervisor approve
Complex/first time generated program specs incl. test cases, interactive diagrams	PM, TL, Supervisor	Group review	Checklist test plan, test case review	Pass checklist review or Supervisor approve
Code	Self-review or Team Lead review or Peer review	Group review	Checklist code review	Pass checklist review or Supervisor approve

3. Requirement Specification

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3.1 Product Perspective

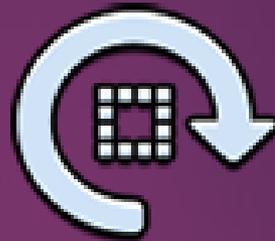


3.2 Functional Requirement

- Use case diagram



Edit Picture



Print

20



Language

21



3.2 Non-functional Requirement

Usability

Reliability

Portability

Performance

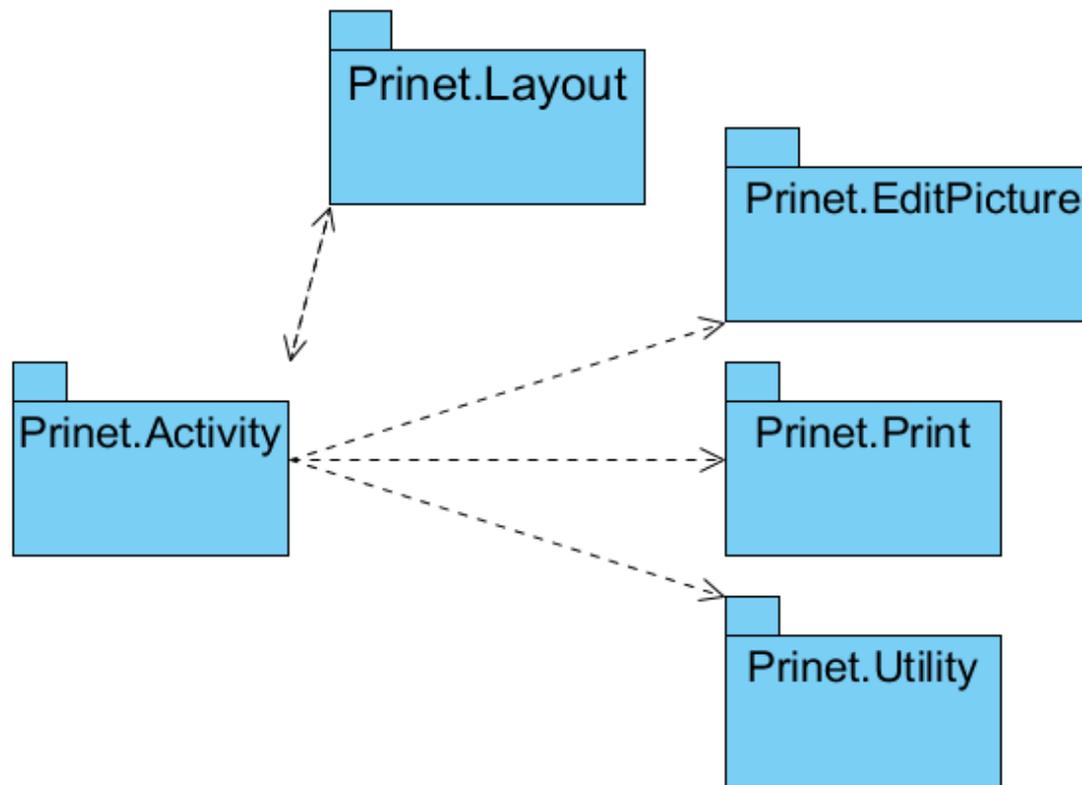
Maintainability

Availability

4. Software Design

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4.1 Architecture Design

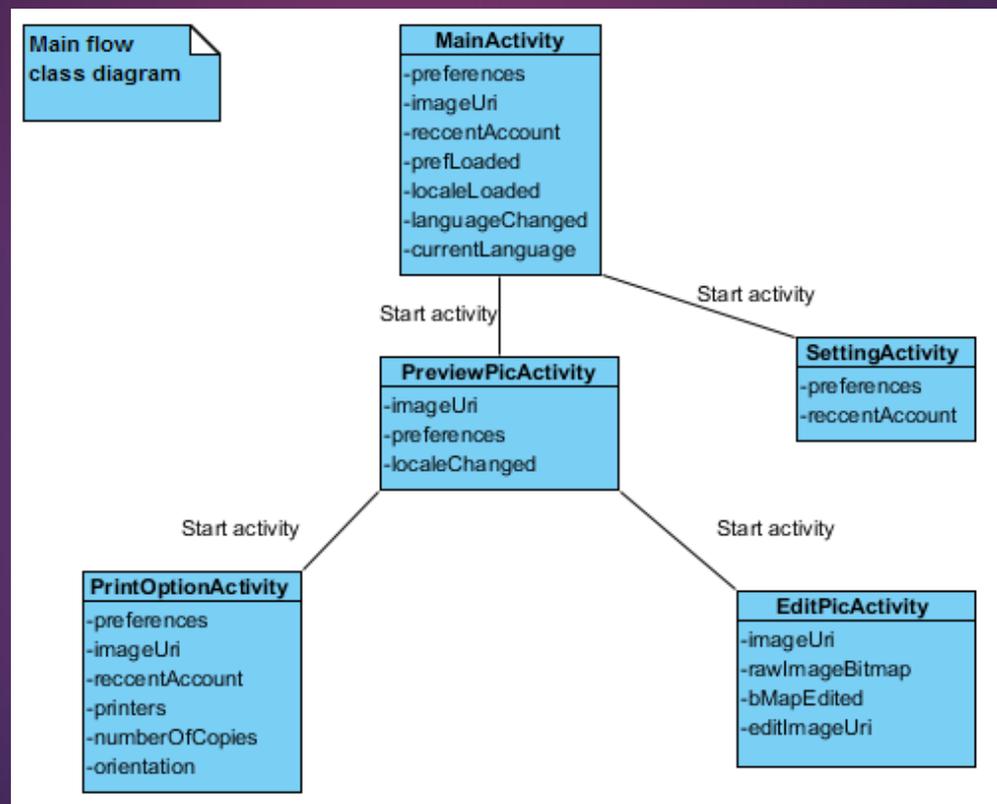


Package Description

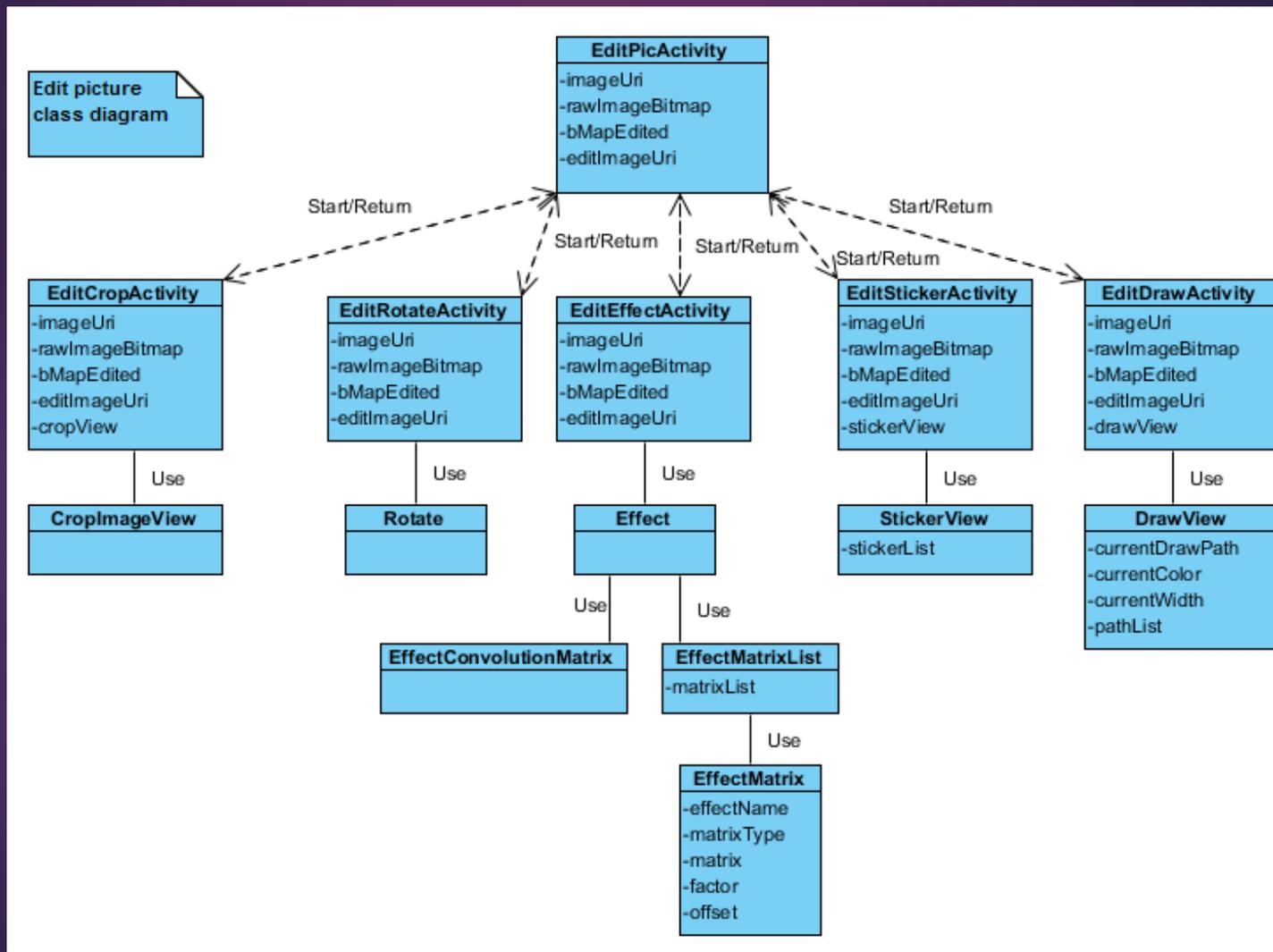
Package	Description
Prinet.Layout	Contain XML layout files for the application (GUI)
Prinet.Activity	Contain all activities of the application, control the operation of Prinet (View-Controller)
Prinet.EditPicture	Contain all classes handle logical process of picture editing
Prinet.Print	Contain all classes handle logical process of Google Cloud print job
Prinet.Utility	Contain all classes handle logical process of common and minor function (data, dialog, share picture ...)

4.2 Class Design

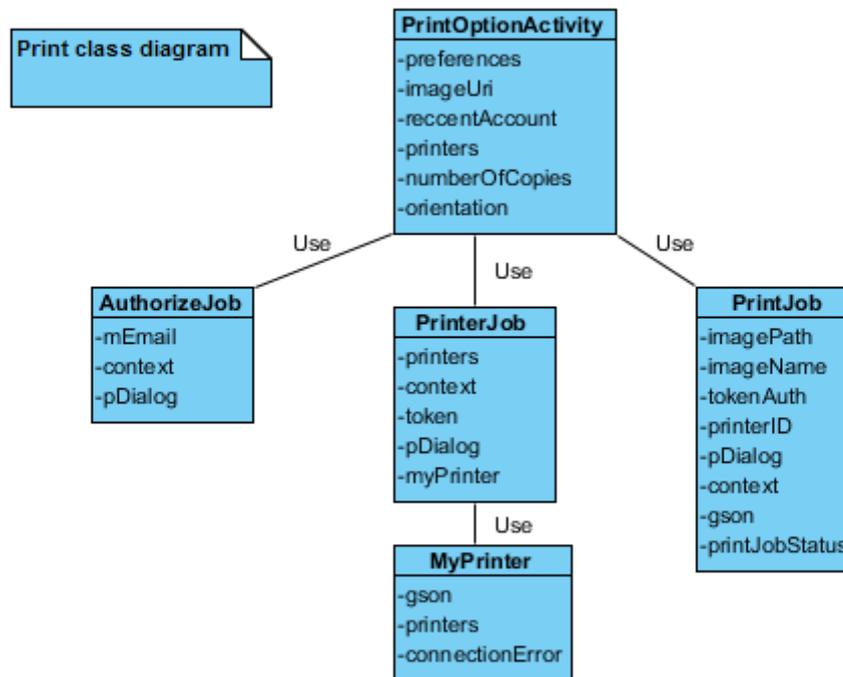
► Main flow Class Diagram



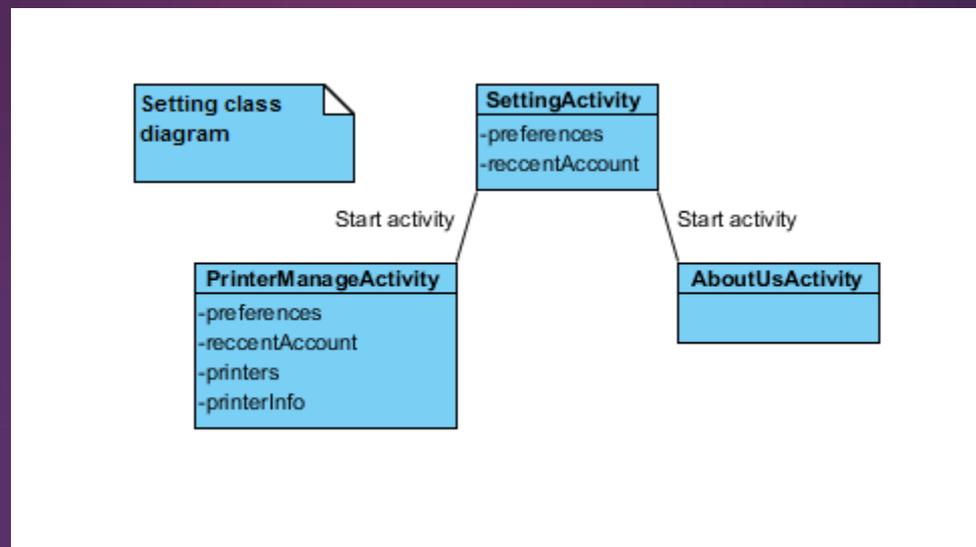
▶ Edit Picture Class Diagram



► Print Class Diagram



▶ Setting Class Diagram



5.

Implementation

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5.1 Development Environment

Item	Description	Expected Availability by	Note
Development Environment			
Hardware	Minimum configuration: 1GB of RAM, 50GB of hard disk, Core 2 Duo	Initiation stage	
Operating System	MS Windows 7 Professional	Initiation stage	
IDE	Eclipse 4.2		
Development language	Java (SDK: Android)		
Technology			
Service	Google Cloud Print		
Equipment & Tools			
Source Version Control	Tortoise SVN 1.8.5		
Document Storage	Tortoise SVN 1.8.5		
Project Management Tool	MS Project	Initiation stage	
Task Tracking	MS Project	Initiation stage	

5.2 Deployment Environment

Operating System	Android 4.0 or higher
Hardware	Samsung Galaxy S3 with GPU Quad-core 1.4 GHz Cortex-A9, chipset Exynos 4412 Quad and 1GB RAM

5.3 Coding Convention

- ▶ Based on FSOFT standard Java coding convention

```
53 private static boolean prefLoaded = false, localeLoaded = false,
54     languageChanged = false;
55 /** Current Language of Printet
56  * Printetアプリケーションの現在の言語*/
57 private static String currentLanguage = null;
58 /** Locale variable
59  * ロケール変数*/
60 private Locale locale = null;
61 public static final int MEDIA_TYPE_PICTURE = 1001;
62
63 @Override
64 protected void onCreate(Bundle savedInstanceState) {
65     super.onCreate(savedInstanceState);
66     setContentView(R.layout.activity_main);
67
68     // Get preferences of Printet
69     // Printetアプリケーションの環境設定の開始
70     pref = getSharedPreferences(Define.PREF_NAME, MODE_PRIVATE);
71     // Retrieve language from preferences, if not existed return null
72     // 環境設定から言語情報を獲得する。なしの場合はnullを返す
73     currentLanguage = pref.getString(Define.PREF_CURRENT_LANGUAGE, null);
74     if (currentLanguage == null)
75         currentLanguage = Define.LOCALE_LANG_EN;
76     if (!prefLoaded) {
77         prefLoaded = true;
78         setLocale(currentLanguage);
79     }
80
81     // Language icons
82     // 言語アイコン
83     Button vnIcon = (Button) findViewById(R.id.vn_lang_icon);
84     Button jaIcon = (Button) findViewById(R.id.jp_lang_icon);
85     Button enIcon = (Button) findViewById(R.id.us_lang_icon);
```

5.4 Coding Review

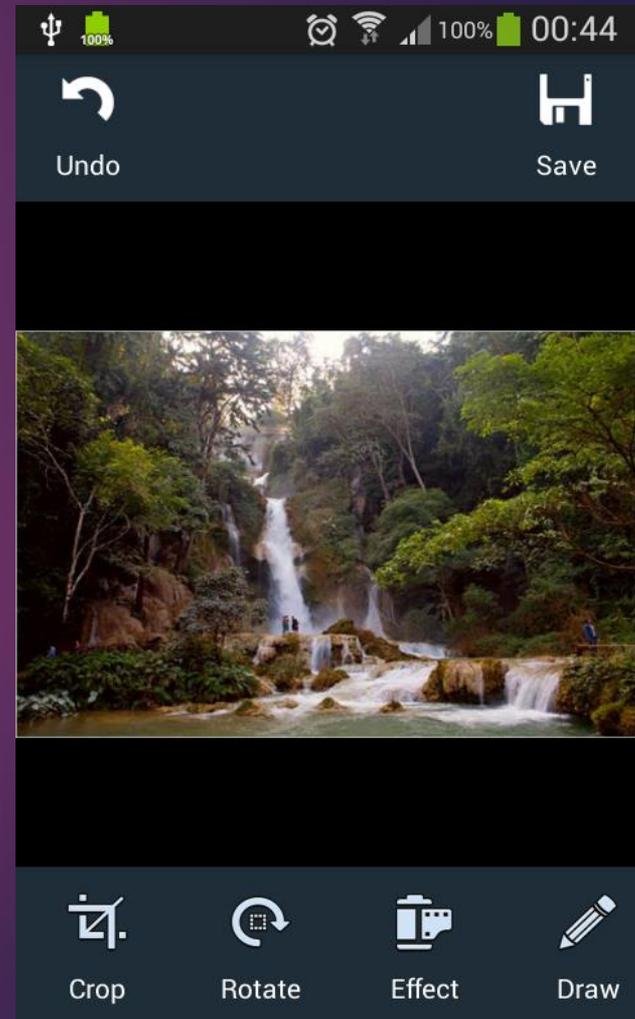
- ▶ Self review
- ▶ Peer review

Question	Yes	No	N/A	Note
Are code, Javadoc and comments used in accord with coding convention ?	X			Fsoft Java Stand Coding convention. File: Standard_Java Coding Convention .pdf
Does code commentation always describe precisely the detailed process of function ?	X			The content of document should be changed according to the change of process flow in function
Is code commentation clear and precise ?	X			Code commentation shoude be easy-to-understand
Do parameters have description ?	X			Each parameter should have clear explanation
Are validation, log and exception fully implemented in source code ?	X			
Is source code built successfully ?	X			
Are recently addition codes ensured to be ran through ?	X			
Are loops in source code optimized ?	X			Avoid redundant loops
Are all variables properly defined with meaningful, consistent, and clear names?	X			
Is source code clear and easy-to-understand ?				
Is the solution solved in a proper way and easy-to-understand ?	X			
With complicated and easy-to-misunderstood code, does it have been commented and precisely explained ?	X			
Avoid redundant hard code.	X			Hard code should not be duplicated
Do all messages and string values use hard code ?	X			Message content must be defined in a definition file
Have all constant variables been defined properly ?	X			Constant variables used in classes should be defined in a constant file of project

5.5 Edit-picture Functions Implementation

- ▶ Crop picture
- ▶ Rotate picture
- ▶ Hand drawing
- ▶ Edit effects
- ▶ Add stickers

All functions are self-made without any libraries or built-in functions



5.5 Edit-picture Functions Implementation (2)

▶ Process :

Input picture → Raw Bitmap → Edited Bitmap → Output Picture

▶ Problems :

Trouble with Bitmap

OutOfMemory error



6. Quality Control

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6.1 Review

6.1.1 Review item

- ▶ Project Plan, CM Plan
- ▶ Software Requirement Specification
- ▶ Design documents
- ▶ Source code
- ▶ Test plan and Test case

6.1 Review

- ▶ A sample of checklist

System Test Review Checklist

Project Code: PN

Reviewer(s): GiangNH

Review date: 2/11/2014

Question	Yes	No	N/A	Note	Priority	Severity
Is the system test using the unit tests and incremental integration test cases, requirements and design?	x					2
Have volume tests been included?			x	Not required		3
Have concurrency tests been included? (Multi user tests)			x	Not required		3
Have error-logging conditions been tested?	x				Mandatory	2
Have restart features been tested?	x				Mandatory	2
Have invalid input conditions been tested?	x				Mandatory	1
Have invalid output conditions been tested?	x				Mandatory	1
Has the functionality as per requirements been tested?	x				Mandatory	1
Have performance requirements been tested?			x	Not required	Mandatory	1
Have security requirements been tested?			x	Not required		1
Have the test results regarding security requirements been reviewed?			x	Not required		3
Have fail over conditions been tested?	x				Mandatory	2
Have scalability tests been conducted?	x					4
Is the correct version of the requirements, design, test case being used for system test?	x					1

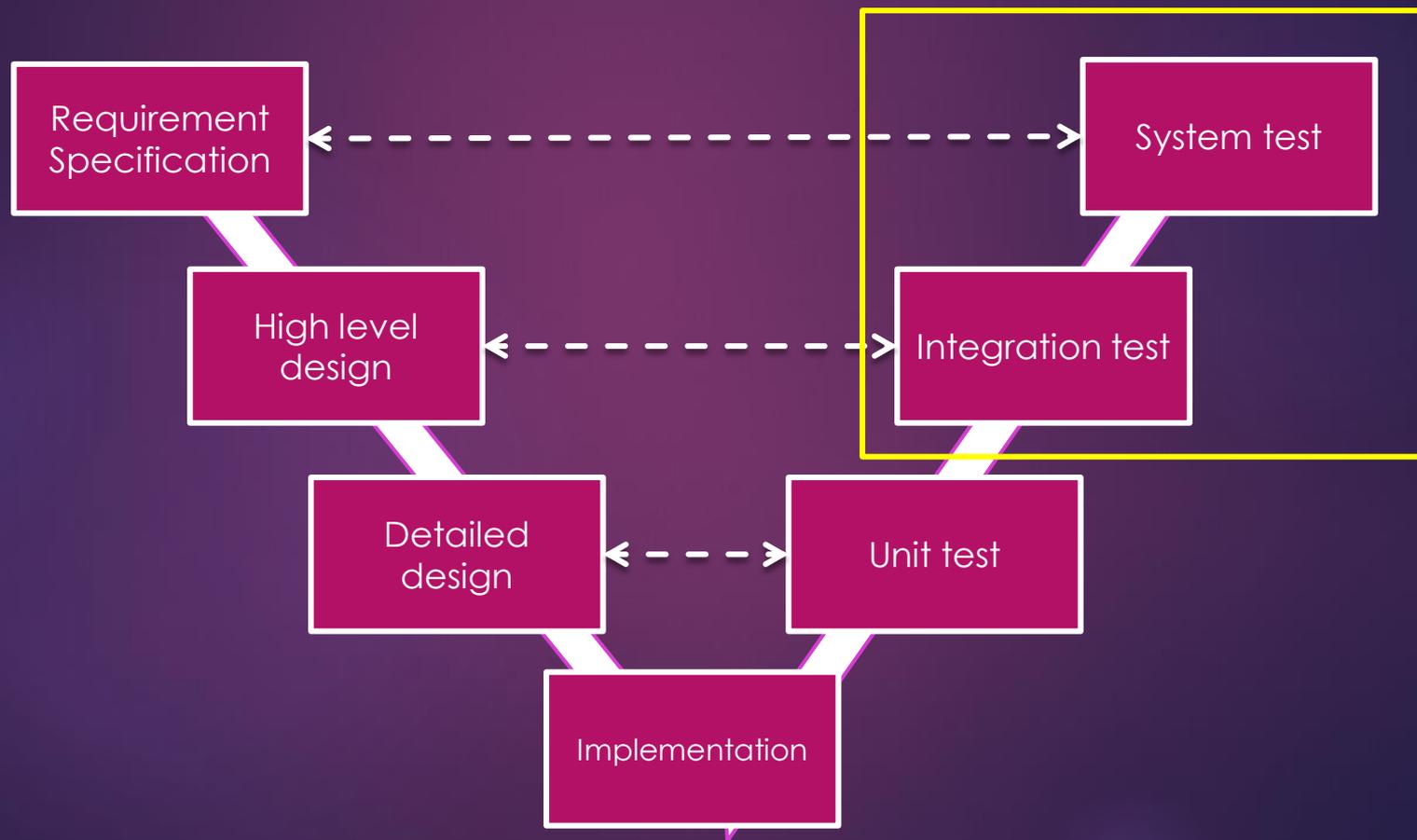
6.1 Review

6.1.2 Defect Report

	Cosmetic	Medium	Serious	Fatal	Total
Document Review	4	0	0	0	4
Source code Review	0	7	0	0	7
	4	7	0	0	11

6.2 Testing

6.2.1 Test Model



6.2 Testing

6.2.2 Test Stage

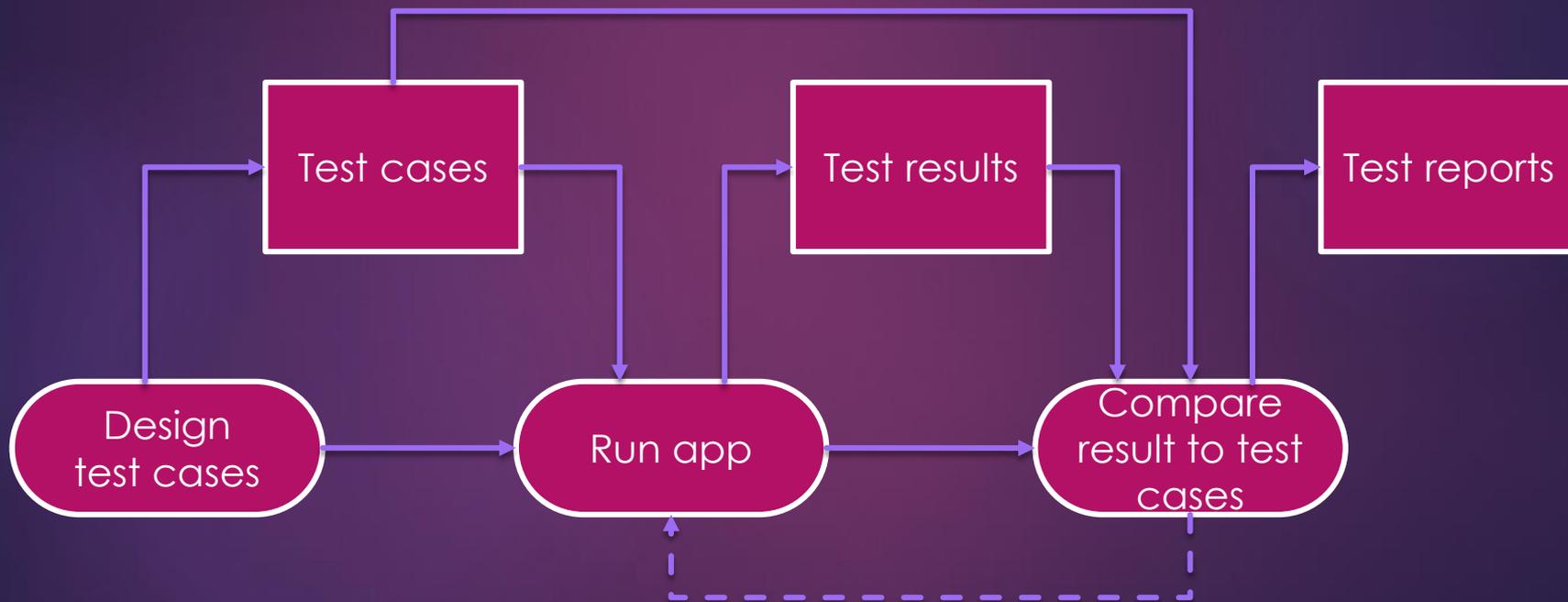
Test Type	Test Stage	
	Unit Test	System Test
Functional Test	X	X
User Interface Test	X	X
Regression Test	X	x

► Acceptance Criteria

	Unit Test	System Test
Number of test case/KLOC	30-40	20-30
Weighted defect/KLOC	2-3	0-2

6.2 Testing

6.2.3 Test Process



6.2 Testing

6.2.2 Test case

- ▶ Sample of Unit Test case

Test item /Result list		Creator	GiangNH	Reviewer	DuongVH	
		Test Environment:				
Title		Main Fbw				
Test case D		001	002	003	004	
Testing conditions/confirmations						
C o n d i t i o n	Start Print application	①	①	①	①	
	Click Main screen's "Capture" button and capture a photo from camera	②		②		
	Click Main screen's "Gallery" button and select a picture from gallery			②	②	
	Click Preview screen's "Print" button	③	③			
	Click Print Option screen's "Select account" and select an account	④	④			
	Click Print Option screen's "Select printer" and select a printer	⑤	⑤			
	Click Print Option screen's "Page Setup"	⑥	⑥			
	Edit some settings from PU02-Page Setup popup and save these settings	⑦	⑦			
	Click Print Option screen's "Print" button	⑧	⑧			
	Click Preview screen's "Edit" button			③	③	
	Click Edit screen's "Crop" button and do crop			④	④	
	Click Edit Crop screen's "Done"			⑤	⑤	
	Click Edit screen's "Reset" button and do reset			⑥	⑥	

6.2 Testing

6.2.3 Test Report

	Cosmetic	Medium	Serious	Fatal	Total
Unit test	2	5	4	0	11
System test	1	1	1	0	3
	3	6	5	0	14

6.3 Defect management sheet

DEFECT MANAGEMENT SHEET									
Project name:		Prinet							
Last modified:		4/17/2014 13:47							
No	Title	Description	Test Process	Severity	Priority	Status	Corrective Action	Deadline	Created By
1	[SRS]Wrong version on header	The version on header was wrong with document's recent version	Document Review	Cosmetic	Low	Fixed	Change to right version		GiangNH
2	[STTestcase]Wrong button name	Sheet S01, line 13: button name is "Capture" but the button name here is "Take a picture"	Document Review	Cosmetic	Low	Fixed	Change button name to "Capture"		GiangNH
3	[UTTestcase]Wrong button name	Sheet S05-2, line 10: button name is "OK" but here, the button name is "Done"	Document Review	Cosmetic	Low	Fixed	Change button name to "OK"		GiangNH
4	[UTTestcase]Cover sheet lost information	Cover sheet does not have any information	Document Review	Cosmetic	Medium	Fixed	Fill the cover sheet		GiangNH
5	Checklist Code Review defect	Some parameters did not have properly comments.	Code Review	Medium	Medium	Fixed	Add comments for those variables		DuongVH
		Request entity variables in PrintJob class are still hard-coded.							

7. Summary

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Lesson Learned

- ▶ **Technique:** Understand and able to use Android to create an application
- ▶ **Communication:** Improve team work skill
- ▶ **Process:** Earn knowledge about FSOF process and able to use some FSOF document
- ▶ **Management:** Improve organization skill and planning skill

8. Demo

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9. Q&A

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Thanks for your attention!