Chapter 8

Testing

Test for vision-based project management system for home decoration company

8.1   Purpose

The test for the system of Vision-Based project management system for home decoration company is mainly focus on E2E test and functional test. The purpose is to test and analyze the results of the development and implementation of the system, to identify problems in the system, and to describe whether the system meets the requirements of the project in terms of both functionality and performance.

8.2   Information

Project name: vision-based project management system for home decoration company

System developer: GRP team 01

E2E testing: Test the overall performance of the system according to the required specifications.

Functional test: Test that each functional module of the software is correct and that the logic is correct.

8.3   Quality assurance

8.3.1   Explanation

Quality Assurance[12] QA focuses on the entire process of software product generation, primarily verifying the integrity, consistency and validity of the processes involved in implementing the software product development process. It ensures that the correct processes are followed for development, testing, etc. As a software product grows and takes shape over its life cycle, the time and cost to fix defects introduced early in its life cycle increase exponentially. Moreover, the basic assumption of QA is that process quality determines software product quality. Software quality assurance permeates all aspects of requirements, design, coding, release, maintenance, configuration management, and documentation, and every aspect of the work done properly will reduce software quality risks.

8.3.2   Tasks

(i) Design the team workflow and documentation system to ensure work efficiency and trace-ability.

(ii) Define standards and make sure all of the doucumented / changed file meets the requirements.

(iii) Approve merge requests only if the changes meet the specifications.

(iv) Arrange meetings for the error collection and expected improvements after each stage is finished.

(v) Encourage to comment and in the GitLab.

(vi) Help team members with technical issues and introduce useful method to solve the problem.

(vii) Hold discussions for some difficult problem happened while coding/ testing.

(viii) Check the test coverage and do the version control

8.4   Test specification

8.4.1   Test importance marking system

Importance Level	Importance	Description
1	`Low`	whether the program could interact with user in a **human-friendly** way
2	`Moderate`	whther the program is able to get through some **few-reached cases**
3	`Major`	whether the program could deal with **common exceptions**
4	`Critical`	whether the program meets users' **basic requirements**
5	`Fatal`	whether the program hinters the **ridiculous outcome**

Figure: Test importance

*Note:*that "**mess up user data**" is of highest importance because this is a **FINANCIAL** app where wrong data is severer than program crash.

8.4.2   Test coverage

Class	Method Coverage	Line Coverage
FrontEnd	100%	92%
BackEnd-Cloud Functions	100%	100%

Figure: Test Coverage

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Note:Previous code data stored in database are not available in the front end test. For no API allows the devtools to get the accurate data in the DB, we change to use mock data to show the modification functionality in the front end code. **Therefore, there is 8% of line can not be reached at present.**

8.5   Test log

Due to the specificity of testing js files, each component is contained on a page, and there is consistency between the unit test and the integration test. The developer tests unit test during the development phase to improve the developer's understanding of the code, improve the reliability of the code, and improve the refactoring and reuse of the code. In the integration test, the path used by the user is checked to see if it works as expected; that is, the smallest program unit needs to be integrated to test if the interfaces between them work in unison. In this test, due to the stakeholder's requirements, our integration test is divided into three users: project manager, house owner and worker.

Unit: **IndexForProjectManager**

Test schedule:

- *Write test script for the pages which are used by Project Manager*

- *Fix script pages connection and redirection*

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-indexForPM 1-1]	[Validation Test]: Test get current start page	-	"pages/indexs/indexForProjectManager/indexForProjectManager"	2	Pass
[TS-indexForPM 2-1]	[Validation Test]: Test jump to specific project page	page.active: 1; element = await page.$('.clickProjectForTest'); element.tap();	"pages/project/projectInfo/projectInfo"	2	Pass
[TS-indexForPM 3-1]	[Validation Test]: Test get back to start page	miniProgram.navigateBack();	"pages/indexs/indexForProjectManager/indexForProjectManager"	2	Pass
[TS-indexForPM 4-1]	[Validation Test]: Test jump to statistics report page	active: 1; element = await page.$('.statisticReportForTest'); await element.tap();	"pages/project/statisticReport/statisticReport"	3	Pass
[TS-indexForPM 5-1]	[Validation Test]: Test jump to create new project	active: 1; element = await page.$('.createNewProjectForTest'); await element.tap();	"pages/project/newProject/newProject"	3	Pass
[TS-indexForPM 6-1]	[Validation Test]: Test get the value of project name	name: "Lokkk's Project for Test"	name: "Lokkk's Project for Test"	3	Pass
[TS-indexForPM 6-2]	[Defect Test]: Test get the value of project name in the format of integrate	name: 1	Throw [IllegalArgumentException]: "String input should not be integrate."	3	Pass
[TS-indexForPM 7-1]	[Validation Test]: Test get the value of project description	description: "Description of project for test"	description: "Description of project for test"	3	Pass
[TS-indexForPM 7-2]	[Defect Test]: Test get the value of project description	description: 1	Throw [IllegalArgumentException]: "String input should not be integrate."	2	Pass
[TS-indexForPM 8-1]	[Validation Test]: Test switch pages between projectInfo	await currentTab: 1; await currentTab: 2; await currentTab: 0;	"pages/project/projectInfo/projectInfo"	3	Pass
[TS-indexForPM 9-1]	[Validation Test]: Test jump to create new task	currentTab: 1; element = await page.$('.createNewProjectForTest'); await element.tap();	"pages/project/newTask/newTask"	3	Pass
[TS-indexForPM 10-1]	[Validation Test]: Test jump to Message	active: 0	"pages/indexs/indexForProjectManager/indexForProjectManager"	2	Pass
[TS-indexForPM 11-1]	[Validation Test]: Test jump to create new project	active: 1; element = await page.$('.createNewProjectForTest'); await element.tap();	"pages/project/newProject/newProject"	2	Pass

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-indexForPM 12-1]	[Validation Test]: Test enter project name	element = await page.$('.projectNameForTest'); await element.tap();	-	2	Pass
[TS-indexForPM 13-1]	[Validation Test]: Test choose template	element = await page.$('.templateForTest'); await element.tap();	"pages/project/projectTemplate/projectTemplate"	2	Pass
[TS-indexForPM 14-1]	[Validation Test]: Test choose template in detail	element = await page.$('.chooseTemplateForTest'); await element.tap();	"isSelected: 1"	3	Pass
[TS-indexForPM 15-1]	[Validation Test]: Test choose start time	element = await page.$('.startTimeForTest'); await element.tap();	-	3	Pass
[TS-indexForPM 16-1]	[Validation Test]: Test choose house owner	element = await page.$('.chooseHouseOwnerForTest'); await element.tap();	"pages/project/contactList/houseOwnerList/houseOwnerList"	3	Pass
[TS-indexForPM 17-1]	[Validation Test]: Test choose participant	element = await page.$('.chooseParticipantForTest'); await element.tap();	"pages/project/contactList/participantList/participantList"	3	Pass
[TS-indexForPM 18-1]	[Validation Test]: Test enter description in the taskinfo	belongTo: "Lokkk's for Test"	belongTo: "Lokkk's for Test"	3	Pass
[TS-indexForPM 19-1]	[Validation Test]: Test jump to comment page	element = await page.$('.addComment'); await element.tap();	"pages/project/addComment/addComment"	2	Pass
[TS-indexForPM 20-1]	[Validation Test]: Test set description in comment	details: "comment for Test"	details: "comment for Test"	5	Pass
[TS-indexForPM 20-2]	[Defect Test]: Test set description in comment	details: 1	Throw [IllegalArgumentException]: "String input should not be integrate."	2	Pass
[TS-indexForPM 21-1]	[Validation Test]: Test jump to setting page	active: 2; element = await page.$('.settingForTest'); await element.tap();	"pages/more/languageSetting/languageSetting"	4	Pass
[TS-indexForPM 22-1]	[Validation Test]: Test check the triggers for priority in task info	element = await page.$('.priorityForTest'); await element.tap(); element.trigger('change', { value:1 });	value:1	3	Pass
[TS-indexForPM 23-1]	[Validation Test]: Test check the triggers in new project page	element = await page.$('.startTimeForTest'); startDate:"2021-12-2"	startDate:"2021-12-2"	4	Pass
[TS-indexForPM 24-1]	[Validation Test]: Test check the description project info	element = await page.$('.projectInfoDescriptionForTest');	null	4	Pass

Figure: Test For User: Project Manager

Unit: **IndexForHouseOwner**

Test schedule:

- *Write test script for the pages which are used by House Owner*

- *Fix script pages connection and redirection*

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-indexForHO 1-1]	**[Validation Test]:** Test get current start page	-	"pages/indexs/indexOfHouseOwner/indexOfHouseOwner"	4	Pass
[TS-indexForHO 2-1]	**[Validation Test]:** Test jump to specific page	active: 1; element = await page.$('.clickProjectForTest'); await element.tap();	"pages/project/projectInfo/projectInfo"	4	Pass
[TS-indexForHO 3-1]	**[Validation Test]:** Test get back to start page	await miniProgram.navigateBack();	"pages/indexs/indexOfHouseOwner/indexOfHouseOwner"	4	Pass
[TS-indexForHO 4-1]	**[Validation Test]:** Test jump to statistics report page	active: 0; element = await page.$('.statisticReportForTest');	"pages/project/statisticReport/statisticReport"	4	Pass
[TS-indexForHO 5-1]	**[Validation Test]:** Test switch pages between projectInfo	currentTab: 0; currentTab: 1;	"pages/project/projectInfo/projectInfo"	4	Pass
[TS-indexForHO 6-1]	**[Validation Test]:** Test jump to Dashboard and taskInfo	currentTab: 1; element = await page.$('.createNewProjectForTest');	"pages/project/newTask/newTask"	3	Pass
[TS-indexForHO 7-1]	**[Validation Test]:** Test jump to Message	active: 0	-	3	Pass
[TS-indexForHO 8-1]	**[Validation Test]:** Test jump to setting page	active: 1; element = await page.$('.settingForTest');	"pages/more/languageSetting/languageSetting"	4	Pass
[TS-indexForHO 9-1]	**[Defect Test]:** Test check the triggers for priority in task info	element = await page.$('.priorityForTest'); await element.trigger('change', { value:1 });	value:1	4	Pass
[TS-indexForHO 10-1]	**[Validation Test]:** Test check the triggers for start time in task info	element = await page.$('.startTimeForTest'); await element.tap();	-	5	Pass
[TS-indexForHO 11-1]	**[Defect Test]:** Test check the description project info	element = await page.$('.projectInfoDescriptionForTest');	()'placeholder')).toBe(null)	3	Pass

Figure: Test For User: House Owner

Unit: **IndexForWorker**

Test schedule:

- *Write test script for the pages which are used by Worker*

- *Fix script pages connection and redirection*

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-indexForWorker 1-1]	[Validation Test]: Test get current start page	-	"pages/indexs/indexForWorker/indexForWorker"	5	Pass
[TS-indexForWorker 2-1]	[Validation Test]: Test get current start page	-	"pages/indexs/indexForWorker/indexForWorker"	5	Pass
[TS-indexForWorker 3-1]	[Validation Test]: Test jump to specific page	active: 1; element = await page.$('.clickProjectForTest');	"pages/project/projectInfo/projectInfo"	2	Pass
[TS-indexForWorker 4-1]	[Validation Test]: Test get back to start page	await miniProgram.navigateBack();	"pages/indexs/indexForWorker/indexForWorker"	5	Pass
[TS-indexForWorker 5-1]	[Validation Test]: Test switch pages between projectInfo	currentTab: 0; currentTab: 1 element = await page.$('.startedTaskForTest');	"pages/project/projectInfo/projectInfo"	2	Pass
[TS-indexForWorker 6-1]	[Validation Test]: Test jump to Dashboard and taskInfo	currentTab: 1; element = await page.$('.createNewProjectForTest');	"pages/project/newTask/newTask"	5	Pass
[TS-indexForWorker 7-1]	[Validation Test]: Test jump to Message	active: 0; element = await page.$('.messageForTest');	"pages/project/fileList/fileList"	5	Pass
[TS-indexForWorker 8-1]	[Validation Test]: Test jump to setting page	active: 1; element = await page.$('.settingForTest');	"pages/more/languageSetting/languageSetting"	5	Pass
[TS-indexForWorker 9-1]	[Defect test]: Test check the triggers for priority in task info	element = await page.$('.priorityForTest'); await element.trigger('change', { value:1 });	value:1	5	Pass
[TS-indexForWorker 10-1]	[Defect test]: Test check the description project info	element = await page.$('.projectInfoDescriptionForTest');	element.property('placeholder')).toBe(null);	5	Pass

Figure: Test For User: Worker

Unit: **TestForCloudFunction**

Test schedule:

- *Write test script for the cloud functions deployed on the cloud*

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-CloudFunction 1-1]	**[Validation Test]:** Test updateData	"currentPriority": "high", "id": "41ae62ef622475720aaa1d6c61b5b8ef"	Success, {"stats":{"updated":0}," errMsg":"document.update:ok"}	3	Pass
[TS-CloudFunction 1-2]	**[Defect Test]:** Test updateData	"currentPriority": "high", "_id": 1	Fail, ret code 1; {"errorCode":1,"err orMessage":"user code exception cau ght","stackTrace":"Error: docId必须为字 符串 或数字\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/databa se /dist/commonjs. /collection.js:22:19)\n at Colle ctionReference.doc (/var/user/node. _modules/wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/ Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/ Runtime.engine.js:56:12)\n. at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)," statusCode":430}	5	Fail
[TS-CloudFunction 1-3]	**[Defect Test]:** Test updateData	"currentPriority": "high", "id": "41ae62ef6224757"	Fail, ret code 2; {"errorCode":2,"errorMessage": "user code exception caught","stackTrace":"Erro r: docId not found\n at CollectionRefe rence.doc (/var/user/node_modules/@cloudba se/database/dist/commonjs /collection.js: 22:19)\n at CollectionReference.doc (/var/use r/node_ modules/wx-server-sdk/index. js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Ru ntime.handleOnce (/var/runtime/node12/Run time.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12 /Runtime.engine.js:56:1 2)\n at listOnTimeout (internal/ti mers.js:549:17)\n at processTimers (interna l/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 2-1]	**[Validation Test]:** Test updateDate	"startTime": "2022-12-1", "endTime": "2022-12-10", "id": "41ae62ef622475720aaa1d6c61b5b8ef"	Success, {"stats": {"updated":0},"errMsg":"document.update:ok"}	3	Pass

Figure .1: Test For Cloud Function

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-CloudFunction 2-2]	[Defect Test]: Test updateDate	"startTime": "2022-12-1", "endTime": "2022-12-10", "_id": "41ae62ef622475720aaa1d"	Fail, ret code 2; {"errorCode":2,"errorMessage": "user code exception caught","stackTrace" :"Error: docId not found\n at CollectionRefere nce.doc (/var/user/node_modules/@cloudbase/ database/dist/com monjs/c ollection.js:22:19)\n at CollectionReference.doc (/var/user/node_. modules/wx-server-sdk/index.js:1203:66)\n at Runtime.exports.mai n [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12 /Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12 /Runtime.engine.js:56:12)\n at listOnTimeo ut (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 2-3]	[Defect Test]: Test updateDate	"startTime": "2022-12-1", "endTime": "2022-12-10", "_id": 1	Fail, ret code 1; {"errorCode":1,"errorMessage":"user code exception caught","stackTrace":"Error: docId必须 为字符串或数字\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/database/dist/c ommonjs/collection.js:22:19)\n at CollectionReferenc e.doc (/var/user/node_modules/wx-server-sdk/index.js: 1203:66)\n at Runtime.exports.main [as handler] (/va r/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runtim e.engine.js:56:12)\n at listOnTimeout (internal/timer s.js:549:17)\n at processTimers (internal/timers.js:49 2:7)","statusCode":430}	5	Fail
[TS-CloudFunction 3-1]	[Validation Test]: Test update message	"belongTo": "41ae62ef622482a30aac125c0b76fa67", "cloudList": "cloud://cloud1 -2gqr09fl444e3a8c-2gqr09fl444e3a8c-1309186018/feedback/5b049cc862249 1b40f75e2ca773c04be/16465637646991.png", "isRead": 0, "type": "sssss", "_openid": "o_jxV5dDOWgGkd3AClyC9Ow8vQgM"	Success, {"stats":{"updated":0},"errMsg": "document.update:ok"}	5	Pass
[TS-CloudFunction 3-2]	[Defect Test]: Test update message	"belongTo": "41ae62ef622", "cloudList": "cloud://cloud1-2gqr09fl444e3a8c.636c -cloud1-2gqr09fl444e3a8c-1309186018/feedback/5b049cc8622491b4 0f75e2ca773c04be/16465637646991.png", "isRead": 0, "type": "sssss", "_openid": "o_jxV5dDOWgGkd3AClyC9Ow8vQgM"	Fail, ret code 2; {"errorCode":2,"errorMessage":"user co de exception caught","stackTrace":"Error: docId not fo und\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/database/dist /commonjs/collection.js:22:19)\n at CollectionRefer ence.doc (/var/user/node_modules/wx-server-sdk/in dex.js:1203:66)\n at Runtime.exports.main [as han dler] (/var/user/index.js:11:6)\n at Runtime.handle Once (/var/runtime/node12/Runtime.engine.js:219:2 3)\n at Timeout._onTimeout (/var/runtime/node12/ Runtime.engine.js:56:12)\n at listOnTimeout (inter nal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 3-3]	[Defect test]: Test update message	"belongTo": "41ae62ef622482a30aac125c0b76fa67", "cloudList": "cloud://cloud1-2gqr09fl444e3a8c.636c -cloud1-2gqr09fl444e3a8c-13091860 18/feedback/5b049cc86 22491b40f75e2ca773c04be/16465637646991.png", "isRead": 0, "type": "", "_openid": "o_jxV5dDOWgGkd3AClyC9Ow8vQgM"	Fail, ret code 0; {"errorCode":0,"errorMessage":"use r code exception caught","stackTrace":"Error: type c annot be empty\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/database/dis t/commonjs/collection.js:22:19)\n at CollectionRe ference.doc (/var/user/node_modules/wx-server-sd k/index.js:12 03:66)\n at Runtime.exports.main [as handler] (/v ar/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runt ime.engine.js:56:12)\n at listOnTimeout (internal/ timers.js:549:17)\n at processTimers (internal/tim ers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 3-4]	[Defect test]: Test update message	"belongTo": 1, "cloudList": "cloud://cloud1 -2gqr09fl444e3a8c.636c-cloud1-2gqr09fl444e3a8c-1309186018/feedback/5b049cc8622491b40f75 e2ca773c04be/16465637646991.png", "isRead": 0, "type": "", "_openid": "o_jxV5dDOWgGkd3AClyC9Ow8vQgM"	Fail, ret code 1; {"errorCode":1,"errorMessage":" user code exception caught","stackTrace":"Error: docId必须为字符串或数字\n at CollectionRefere nce.doc (/var/user/node_modules/@cloudbase/database /dist/commonjs/collection.js:22:19)\n at Collect ionReference.doc (/var/user/node_modules/wx-s erver-sdk/index.js:1203:66)\n at Runtime.expor ts.main [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/R untime.engine.js:219:23)\n at Timeout._onTime out (/var/runtime/node12/Runtime.engine.js:56: 12)\n at listOnTimeout (internal/timers.js:549:1 7)\n at processTimers (internal/timers.js:492:7) ","statusCode":430}	5	Fail
[TS-CloudFunction 4-1]	[Validation Test]: Test update project date	"id":"41ae62ef622178900a4438f55a05db79", "startTime": "2022-12-1", "endTime": "2022-12-10"	Success, {"stats":{"updated":0},"errMsg": "document.update:ok"}	5	Pass

Figure: Test For Cloud Function

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-CloudFunction 4-2]	**[Defect Test]:** Test update project date	"id":"41ae62ef6221", "startTime": "2022-12-1", "endTime": "2022-12-10"	Fail, ret code 2; {"errorCode":2,"errorMessage":" user code exception caught","stackTrace":"Error: docId not found\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/databas e/dist/commonjs/collection.js:22:19)\n at Coll ectionReference.doc (/var/user/node_modules/ wx-server-sdk/index.js:1203:66)\n at Runtime .exports.main [as handler] (/var/user/index.js:1 1:6)\n at Runtime.handleOnce (/var/runtime/n ode12/Runtime.engine.js:219:23)\n at Timeout ._onTimeout (/var/runtime/node12/Runtime.en gine.js:56:12)\n at listOnTimeout (internal/time rs.js:549:17)\n at processTimers (internal/timer s.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 4-3]	**[Defect Test]:** Test update project date	"id":"41ae62ef622178900a4438f55a05db79", "startTime": "", "endTime": "2022-12-10"	Fail, ret code 0; {"errorCode":0,"errorMessage":" user code exception caught","stackTrace":"Erro r: startTime cannot be empty\n at CollectionR eference.doc (/var/user/node_modules/@clou dbase/databas e/dist/commonjs/collection.js:22:19)\n at Coll ectionReference.doc (/var/user/node_modules /wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/i ndex.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/ Runtime.engine.js:56:12)\n at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 4-4]	**[Defect Test]:** Test update project date	"id":"41ae62ef622178900a4438f55a05db79", "startTime": "2022-12-1", "endTime": ""	Fail, ret code 0; {"errorCode":0,"errorMessag e":"user code exception caught","stackTrac e":"Error: endTime cannot be empty\n at CollectionReference.doc (/var/user/node _modules/@cloudbase/d atabase/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node _modules/wx-server-sdk/index.js:1203:66) \n at Runtime.exports.main [as handler] (/va r/user/index.js:11:6)\n at Runtime.handl eOnce (/var/runtime/node12/Runtime.eng ine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runtime.engine.j s:56:12)\n at listOnTimeout (internal/t imers.js:549:17)\n at processTimers (in ternal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 5-1]	**[Validation Test]:** Test updateProjectDescription	"id": "41ae62ef622178900a4438f55a05db79", "projectDescription": "test value 2", "stateDescription": "test value 3"	Success, {"stats":{"updated":0},"errMsg": "document.update:ok"}	5	Pass
[TS-CloudFunction 5-2]	**[Defect Test]:** Test updateProjectDescription	"id": "41ae62ef", "projectDescription": "test value 2", "stateDescription": "test value 3"	Fail, ret code 2; {"errorCode":2,"errorMessa ge":"user code exception caught","stackTra ce":"Error: docId not found\n at Collectio nReference.doc (/var/user/node_modules/ @cloudbase/dat abase/dist/commonjs/collection.js:22:19)\ v n at CollectionReference.doc (/var/user/nod e_modules/wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Runtime.ha ndleOnce (/var/runtime/node12/Runtime. engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runtime.engine.js:5 6:12)\n at listOnTimeout (internal/timer s.js:549:17)\n at processTimers (internal /timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 5-3]	**[Defect Test]:** Test updateProjectDescription	"id": "41ae62ef622178900a4438f55a05db79", "projectDescription": "", "stateDescription": "test value 3"	Fail, ret code 0; {"errorCode":0,"errorMessa ge":"user code exception caught","stackTrac e":"Error: projectDescription cannot be emp ty\n at CollectionReference.doc (/var/use r/node_modules/@cloudbase/dat abase/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node _modules/wx-server-sdk/index.js:1203:66)\n a t Runtime.exports.main [as handler] (/var/use r/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219: 23)\n at Timeout._onTimeout (/var/runtim e/node12/Runtime.engine.js:56:12)\n at li stOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)\n at "statusCode":430}	5	Fail

Figure .3: Test For Cloud Function

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-CloudFunction 5-4]	[Defect Test]: Test updateProjectDescription	"id": "41ae62ef622178900a4438f55a05db79", "projectDescription": "test value 2", "stateDescription": ""	Fail, ret code 0; {"errorCode":0,"errorMessage" :"user code exception caught","stackTrace":"E rror: stateDescription cannot be empty\n at CollectionReference.doc (/var/user/node_mo dules/@cloudbase/datab ase/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_mod ules/wx-server-sdk/index.js:1203:66)\n at Ru ntime.exports.main [as handler] (/var/user/ind ex.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219:2 3)\n at Timeout._onTimeout (/var/runtime/no de12/Runtime.engine.js:56:12)\n at listOnTi meout (internal/timers.js:549:17)\n at proce ssTimers (internal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 6-1]	[Validation Test]: Test updateTaskDescription	"id": "41ae62ef622475720aaa1d6c61b5b8ef", "descriptions": "test value 2"	Success, {"stats":{"updated":0},"errMsg": "document.update:ok"}	5	Pass
[TS-CloudFunction 6-2]	[Defect Test]: Test updateTaskDescription	"id": "41ae62ef62247f", "descriptions": "test value 2"	Fail, ret code 2; {"errorCode":2,"errorMessage ":"user code exception caught","stackTrace":" Error: docId not found\n at CollectionRefere nce.doc (/var/user/node_modules/@cloudb ase/datab ase/dist/commonjs/collection.js:22:19)\n a t CollectionReference.doc (/var/user/node_m odules/wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/ user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219 :23)\n at Timeout._onTimeout (/var/runtim e/node12/Runtime.engine.js:56:12)\n at lis tOnTimeout (internal/timers.js:549:17)\n a t processTimers (internal/timers.js:492:7)," statusCode":430}	5	Fail
[TS-CloudFunction 6-3]	[Defect Test]: Test updateTaskDescription	"id": 1, "descriptions": "test value 2"	Fail, ret code 1; {"errorCode":1,"errorMessage" :"user code exception caught","stackTrace":" Error: docId必须为字符串 或数字\n at CollectionReference.doc (/var/user/node_mo dules/@cloudbase/ database/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_mod ules/wx-server-sdk/index.js:1203:66)\n at Runt ime.exports.main [as handler] (/var/user/index.j s:11:6)\n at Runtime.handleOnce (/var/runtim e/node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/nod e12/Runtime.engine.js:56:12)\n at listOnTime out (internal/timers.js:549:17)\n at processTi mers (internal/timers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 6-4]	[Defect Test]: Test updateTaskDescription	"id": "41ae62ef622475720aaa1d6c61b5b8ef", "descriptions": ""	Fail, ret code 0; {"errorCode":0,"errorMessage": "user code exception caught","stackTrace":"Erro r: description cannot be empty\n at Collection Reference.doc (/var/user/node_modules/@clou dbase/databas e/dist/commonjs/collection.js:22:19)\n at Col lectionReference.doc (/var/user/node_modules /wx-server-sdk/index.js:1203:66)\n at Runtim e.exports.main [as handler] (/var/user/index.js: 11:6)\n at Runtime.handle Once (/var/runtime/node12/Runtime.engin e.js:219:23)\n at Timeout._onTimeout (/v ar/runtime/node12/Runtime.engine.js:5 6:12)\n at listOnTimeout (internal/timers .js:549:17)\n at processTimers (internal/ti mers.js:492:7)","statusCode":430}	5	Fail
[TS-CloudFunction 7-1]	[Validation Test]: Test updateDelayedState	"state": 1,"endTime": "2020-1-1"	Success, {"stats":{"updated":0},"errMsg" :"document.update:ok"}	4	Pass
[TS-CloudFunction 7-2]	[Defect Test]: Test updateDelayedState	"state": 6,"endTime": "2020-1-1"	Fail, ret code 2; {"errorCode":2,"errorMessage ":"user code exception caught","stackTrace":" Error: state not found\n at CollectionReference.doc (/var/user/node_ modules/@cloudbase/database/ dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_modules/wx-server-sdk/index .js:1203:66)\n at Runtime.exports.main [as handler] (/var/user /index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12 /Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12 /Runtime.engine.js:56:12)\n at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)", "statusCode":430}	5	Fail
[TS-CloudFunction 8-1]	[Validation Test]: Test updateProgressingState	"state": 1,"endTime": "2020-1-10","startTime": "2020-1-1"	Success, {"stats":{"updated":0}," errMsg":"document.update:ok"}	3	Pass

Figure .4: Test For Cloud Function

Test ID	Type	Inputs	Expected Outcome	Importance	Result
[TS-CloudFunction 8-2]	[Defect Test]: Test updateProgressingState	"state": 6,"endTime": "2020-1-10","startTime": "2020-1-1"	Fail, ret code 2; {"errorCode":2,"errorMessage": "user code exception caught","stackTrace" :"Error: state not found\n at CollectionReference.doc (/var/user/node_modules/@cloudbase/ database/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_modules/ wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/ node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runtime.engine.js:56:12)\n at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)" ,"statusCode":430}	5	Fail
[TS-CloudFunction 9-1]	[Validation Test]: Test updateUnstartedState	"state": 1,"startTime": "2020-1-1"	Success, {"stats":{"updated":0},"errMsg": "document.update:ok"}	3	Pass
[TS-CloudFunction 9-2]	[Defect Test]: Test updateUnstartedState	"state": 6,"startTime": "2020-1-1"	Fail, ret code 2; {"errorCode":2,"errorMessage": "user code exception caught","stackTrace": "Error: state not found\n at CollectionReference.doc (/var/user/node_modules/@cloudbas e/database/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_modules/ wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node 12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/n ode12/Runtime.engine.js:56:12)\n at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)", "statusCode":430}	5	Fail
[TS-CloudFunction 9-3]	[Defect Test]: Test updateUnstartedState	"state": 1,"startTime": ""	Fail, ret code 0; {"errorCode":0,"errorMessage": "user code exception caught","stackTrace": "Error: startTime cannot be empty\n at CollectionReference.doc (/var/user/node_modules/ @cloudbase/database/dist/commonjs/collection.js:22:19)\n at CollectionReference.doc (/var/user/node_modules/ wx-server-sdk/index.js:1203:66)\n at Runtime.exports.main [as handler] (/var/user/index.js:11:6)\n at Runtime.handleOnce (/var/runtime/node12/Runtime.engine.js:219:23)\n at Timeout._onTimeout (/var/runtime/node12/Runtime.engine.js:56:12)\n at listOnTimeout (internal/timers.js:549:17)\n at processTimers (internal/timers.js:492:7)","statusCode":430}	5	Fail

Figure .5: Test For Cloud Function

8.6   Test summary

Customer requirements are tested by acceptance testing. Acceptance testing is also based on black-box testing, using real data to check the system's behaviour. All interfaces are checked for usability as a complete system to ensure that the system is built to meet the stakeholders' requirements. System testing is done jointly by testers and developers, and acceptance testing is done jointly by developers and stakeholders.

All the **System tests** which test the overall performance of the system are under the **miniprogram automator test** by WeChat Develop tool using the links between pages and elements in the pages.

8.7   Test method

To use the miniprogram automator, input the following lines in terminal:

- npm i miniprogram-automator –save-dev

- npm i miniprogram-automator jest

- npm i jest -g

Then, input **"jest index.spec.js"** in the terminal, which **index.spec.js** is the name of your test file. In our program, the test files' name are given:

- index.spec.js

- indexForHO.spec.js

- indexForWorker.spec.js

In terms of this miniprogram automator, all system test tests passed in

the testing.

8.8   Feedback from stakerholders

In the previous several system tests, to create a complete template, stakeholders experienced the full process of the software. They found that the page jump was often slow, there was no way to run the applet very smoothly, and therefore raised the hope that the exclusive use of the process within 2 minutes for all three users. For this reason, we modified the code logic and the front and back-end interaction to meet this demand.

Unit: **IndexForProjectManager**

```
[(base) edison@Loks-MacBook-Pro team01 % jest TestCase/index.spec.js
 PASS  TestCase/index.spec.js (88.882 s)
  index
    ✓ get current start page (3 ms)
    ✓ jump to specific page (2562 ms)
    ✓ get back to start page (2507 ms)
    ✓ jump to statistics report page (2589 ms)
    ✓ jump to create new project (2570 ms)
    ✓ get the value of project name (265 ms)
    ✓ get the value of project description (15 ms)
    ✓ switch pages between projectInfo (15182 ms)
    ✓ jump to create new task (2649 ms)
    ✓ jump to Message (2053 ms)
    ✓ jump to create new project (2592 ms)
    ✓ enter project name (755 ms)
    ✓ choose template (547 ms)
    ✓ choose template in detail (519 ms)
    ✓ choose start time (2547 ms)
    ✓ choose house owner (549 ms)
    ✓ choose participant (2567 ms)
    ✓ test enter description in the taskinfo (2536 ms)
    ✓ jump to comment page (2058 ms)
    ✓ set description in comment (512 ms)
    ✓ jump to setting page (2668 ms)
    ✓ check the triggers for priority in task info (2542 ms)
    ✓ check the triggers for start time in task info (2567 ms)
    ✓ check the triggers in new project page (2575 ms)
    ✓ check the description project info (2565 ms)

Test Suites: 1 passed, 1 total
Tests:       25 passed, 25 total
Snapshots:   0 total
Time:        88.964 s
Ran all test suites matching /TestCase\/index.spec.js/i.
```

Figure: The test report for project manager

Unit: **IndexForHouseOwner**

```
[(base) edison@Loks-MacBook-Pro team01 % jest TestCase/indexForHO.spec.js
  PASS  TestCase/indexForHO.spec.js (54.548 s)
  index
    ✔ get current start page (2 ms)
    ✔ jump to specific page (2597 ms)
    ✔ get back to start page (2511 ms)
    ✔ jump to statistics report page (2575 ms)
    ✔ switch pages between projectInfo (11062 ms)
    ✔ jump to Dashboard and taskInfo (2590 ms)
    ✔ jump to Message (2049 ms)
    ✔ jump to setting page (2666 ms)
    ✔ check the triggers for priority in task info (2554 ms)
    ✔ check the triggers for start time in task info (2049 ms)
    ✔ check the description project info (2563 ms)

Test Suites: 1 passed, 1 total
Tests:       11 passed, 11 total
Snapshots:   0 total
Time:        54.637 s
Ran all test suites matching /TestCase\/indexForHO.spec.js/i.
```

Figure: The test report for house onwer

Unit: **IndexForWorker**

```
[(base) edison@Loks-MacBook-Pro team01 % jest TestCase/indexForWorker.spec.js
  PASS  TestCase/indexForWorker.spec.js (47.935 s)
  index
    ✔ get current start page (1 ms)
    ✔ jump to specific page (2619 ms)
    ✔ get back to start page (2509 ms)
    ✔ switch pages between projectInfo (11078 ms)
    ✔ jump to Dashboard and taskInfo (2059 ms)
    ✔ jump to Message (2065 ms)
    ✔ jump to setting page (2653 ms)
    ✔ check the triggers for priority in task info (2545 ms)
    ✔ check the triggers for start time in task info (2045 ms)
    ✔ check the description project info (2559 ms)

Test Suites: 1 passed, 1 total
Tests:       10 passed, 10 total
Snapshots:   0 total
Time:        48.004 s
Ran all test suites matching /TestCase\/indexForWorker.spec.js/i.
```

Figure: The test report for worker

8.9   Validation

During the development process, to confirm changes in requirements promptly, a formal meeting is held once a week, where the corresponding test cases and code are discussed and modified. This was used to minimize the gap between the completed features and the requirements. The previous systems were approved in addition to the fluency of the users. In the final phase, the overall usage time of our system testing has been significantly reduced. Furthermore, received recognition from the stakeholders.