商场促销系统

需求分析文档（Proposed Version）

Arvin Si.Chuan/邱依强

2017

目录

[1 介绍 1](#_Toc482619282)

[1.1 目的 1](#_Toc482619283)

[1.2 范围 1](#_Toc482619284)

[1.3 定义，缩写词 1](#_Toc482619285)

[1.4 参考资料 1](#_Toc482619286)

[1.5 内容概览 1](#_Toc482619287)

[1.5.1 身份验证模块 1](#_Toc482619288)

[1.5.2 结算模块 1](#_Toc482619289)

[1.5.3 促销规则匹配模块 2](#_Toc482619290)

[1.5.4 支付模块 2](#_Toc482619291)

[1.5.5 分级管理模块 2](#_Toc482619292)

[1.5.6 外部系统支持 2](#_Toc482619293)

[1.5.7 开发策略和环境 2](#_Toc482619294)

[2 需求分析过程表示方法 2](#_Toc482619295)

[2.1 活动图（activity diagram） 2](#_Toc482619296)

[2.2 用例图（Use case diagram） 3](#_Toc482619297)

[3 促销系统所要达成的目标和限制 3](#_Toc482619298)

[3.1 目标 3](#_Toc482619299)

[3.2 限制 3](#_Toc482619300)

[3.2.1 经费与时间的限制 3](#_Toc482619301)

[3.2.2 安全性限制 3](#_Toc482619302)

[3.2.3 性能与稳定性限制 3](#_Toc482619303)

[4 开发策略与环境 4](#_Toc482619304)

[4.1 开发策略 4](#_Toc482619305)

[4.2 开发环境 4](#_Toc482619306)

[5 需求分析详细过程 4](#_Toc482619307)

[5.1 Requirements Model Overview diagram 4](#_Toc482619308)

[5.2 Functional Requirements 4](#_Toc482619309)

[5.2.1 Functional Requirements diagram 5](#_Toc482619310)

[5.2.2 Features 5](#_Toc482619311)

[6 通过活动图分析系统流程 6](#_Toc482619312)

[6.1 activity diagrams 6](#_Toc482619313)

[6.1.1 admins side 6](#_Toc482619314)

[6.1.2 admins manage market diagram 6](#_Toc482619315)

[6.1.3 cashier side 7](#_Toc482619316)

[6.1.4 cashier do checkout diagram 7](#_Toc482619317)

[6.1.5 customers side 8](#_Toc482619318)

[6.1.6 market side 10](#_Toc482619319)

[7 通过用例图分析系统功能点 11](#_Toc482619320)

[7.1 use case diagrams 11](#_Toc482619321)

[7.2 Use Case Model Overview diagram 11](#_Toc482619322)

[7.2.1 Actors 12](#_Toc482619323)

[7.2.2 Primary Use Cases 13](#_Toc482619324)

[8 结语 31](#_Toc482619325)

# 介绍

## 目的

本文档是商场促销系统的需求分析报告，从活动图的角度分析商场促销的整个流程，而后根据活动图中的流程，从用例图的角度全面地阐述了整个系统的功能点，目的在于在客户和分析员、编程人员之间建立起一道关于整个促销系统的桥梁。

## 范围

本文档从整个商场的销售环境入手，一点点分析确定边界，最后将注意力集中在促销系统中，其中的主要部分为：促销部分、收银部分、付款部分、身份验证部分和管理部分。

## 定义，缩写词

促销系统：商场促销系统

## 参考资料

百度百科：活动图、用例图；

《面向对象软件工程》[ISBN：9787302448884]

《软件工程案例教程》[ISBN：9787302305149]

## 内容概览

### 身份验证模块

在用户开始使用系统时，以及一段时间没进行操作使得身份状态超时时，需要验证身份信息。

### 结算模块

顾客在挑选完商品后要进行商品的结算，包括对商品的逐一扫描、促销的自动处理和金额的显示。

### 促销规则匹配模块

这是促销系统的核心部分，需要在大量的商品、顾客信息、日期等信息中进行匹配并得出符合的促销规则，对订单进行促销处理。

### 支付模块

用户结算完成后进行支付，主要涉及到支付接口设计。

### 分级管理模块

促销系统在商场中可能存在多种的管理层级，同时促销规则本身也是需要管理的部分，本模块主要负责这样的内容。

### 外部系统支持

促销系统只负责促销规则的处理、面向顾客的收银员侧系统和管理模块，对于雇员信息、顾客信息和商品信息，不属于促销系统的责任范围。

### 开发策略和环境

开发策略是本次项目所遵循的总体开发思路，如采用的架构等等；开发环境是指项目运行起来所需要的基本环境。

# 需求分析过程表示方法

## 活动图（activity diagram）

活动图（activity diagram，动态图）是阐明了业务用例实现的工作流程。业务工作流程说明了业务为向所服务的业务主角提供其所需的价值而必须完成的工作。业务用例由一系列活动组成，它们共同为业务主角生成某些工件。工作流程通常包括一个基本工作流程和一个或多个备选工作流程。工作流程的结构使用活动图来进行说明。

## 用例图（Use case diagram）

用例图是指由参与者（Actor）、用例（Use Case），边界以及它们之间的关系构成的用于描述系统功能的视图。用例图（User Case）是被称为参与者的外部用户所能观察到的系统功能的模型图，呈现了一些参与者和一些用例，以及它们之间的关系，主要用于对系统、子系统或类的功能行为进行建模。

# 促销系统所要达成的目标和限制

## 目标

系统在收银的时候能够快速录入商品信息、自动匹配符合的促销规则并得出单价与总金额，能够再次之后提供给顾客多种的付款方式。

管理侧能够简单有效地对系统各个功能进行管理，能够分级地实现管理目标。

## 限制

### 经费与时间的限制

本项目的经费限制为：0元

本项目的时间限制为：2017年#月#号

### 使用产品的限制

本项目系统需要采用Oracle 12c数据库系统产品，由用户购买使用许可；系统的部署需要能够安装Apache Tomcat 8 服务器，其内存应当大于6GB，硬盘应当具有至少15G的空闲空间，至少具有100Mbps的网络速度。

### 安全性限制

在没有操作的情况下，用户登录身份会在一定时间内过期，使用系统需要重新验证身份。客户与管理员的操作界面要分离，但其登录系统一致。管理员只能处理其权限范围以内的对象。

### 性能与稳定性限制

系统需要保证用户在使用过程中尽可能少地出现崩溃等问题，需要在长时间的使用后依然保持可用状态。

# 开发策略与环境

## 开发策略

促销系统的开发主要采用Web方式，使用SpringFramework进行MVC三层结构的设计，系统运行时需要使用Chrome浏览器或其兼容的浏览器。

## 开发环境

本项目的开发使用Java jdk1.8，采用的SpringFramework版本为4.3.8 RELEASE，使用Oracle 12c数据库。

# 需求分析详细过程

## Requirements Model Overview diagram

Custom diagram in package 'Requirements'

Requirements Model Overview

Version 1.0

邱依强 created on 2017/5/8. Last modified 2017/5/14



1. Requirements Model Overview

## Functional Requirements

Package in package 'Requirements'

Functional Requirements

Version 1.0 Phase 1.0 Proposed

created on 2017/5/8. Last modified 2017/5/8

### Functional Requirements diagram

Custom diagram in package 'Functional Requirements'

Functional Requirements

Version 1.0

邱依强 created on 2017/5/8. Last modified 2017/5/14



1. Functional Requirements

### Features

Package in package 'Functional Requirements'

The Features package contains

Features

Version 1.0 Phase 1.0 Proposed

created on 2017/5/8. Last modified 2017/5/8

# 通过活动图分析系统流程

## activity diagrams

Package in package 'Features'

activity diagrams

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/9. Last modified 2017/5/9

### admins side

Package in package 'activity diagrams'

admins side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/9. Last modified 2017/5/9

### admins manage market diagram

Activity diagram in package 'admins side'

admins manage market

Version 1.0

邱依强 created on 2017/5/9. Last modified 2017/5/9



1. admins manage market

### cashier side

Package in package 'activity diagrams'

cashier side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/9. Last modified 2017/5/9

Alias 收银员侧

### cashier do checkout diagram

Activity diagram in package 'cashier side'

cashier do checkout

Version 1.0

邱依强 created on 2017/5/9. Last modified 2017/5/10



1. cashier do checkout

### customers side

Package in package 'activity diagrams'

customers side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/8. Last modified 2017/5/9

###### CustomerBuySth diagram

Activity diagram in package 'customers side'

CustomerBuySth

Version 1.0

邱依强 created on 2017/5/8. Last modified 2017/5/9



1. CustomerBuySth

##### exchange salers side

Package in package 'activity diagrams'

exchange salers side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/9. Last modified 2017/5/9

###### exchange salers do exchange diagram

Activity diagram in package 'exchange salers side'

exchange salers do exchange

Version 1.0

邱依强 created on 2017/5/9. Last modified 2017/5/9



1. exchange salers do exchange

### market side

Package in package 'activity diagrams'

market side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/9. Last modified 2017/5/9

###### market side - customer oreinted diagram

Activity diagram in package 'market side'

market side - customer oreinted

Version 1.0

邱依强 created on 2017/5/9. Last modified 2017/5/9



1. market side - customer oreinted

# 通过用例图分析系统功能点

## use case diagrams

Package in package 'Features'

use case diagrams

Version Phase 1.0 Proposed

created on 2017/5/9. Last modified 2017/5/9

## Use Case Model Overview diagram

Use Case diagram in package 'use case diagrams'

Use Case Model Overview

Version 1.0

邱依强 created on 2017/5/9. Last modified 2017/5/10



1. Use Case Model Overview

### Actors

Package in package 'use case diagrams'

Actors

Version 1.0 Phase 1.0 Proposed

created on 2017/5/9. Last modified 2017/5/9

###### Actors diagram

Use Case diagram in package 'Actors'

Actors

Version 1.0

邱依强 created on 2017/5/10. Last modified 2017/5/14



1. Actors

### Primary Use Cases

Package in package 'use case diagrams'

Primary Use Cases

Version 1.0 Phase 1.0 Proposed

created on 2017/5/9. Last modified 2017/5/9

###### Cash-side system diagram

Use Case diagram in package 'Primary Use Cases'

Cash-side system

Version 1.0

邱依强 created on 2017/5/10. Last modified 2017/5/14



1. Cash-side system

###### Administrate sub system

Package in package 'Primary Use Cases'

Administrate sub system

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Administrate sub system diagram

Use Case diagram in package 'Administrate sub system'

Administrate sub system

Version 1.0

邱依强 created on 2017/5/10. Last modified 2017/5/11



1. Administrate sub system

Cash side system management

UseCase in package 'Administrate sub system'

Cash side system management

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 收银侧系统管理

Oder management

UseCase in package 'Administrate sub system'

Oder management

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 订单管理

cash side employee management

UseCase in package 'Administrate sub system'

cash side employee management

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 收银侧雇员管理

discount management

UseCase in package 'Administrate sub system'

discount management

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 促销管理

**discount management diagram**

Interaction diagram in package 'Administrate sub system'

discount management

Version 1.0

邱依强 created on 2017/5/13. Last modified 2017/5/13



1. discount management

###### Checkout sub System

Package in package 'Primary Use Cases'

Checkout sub System

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 结算子系统

Checkout system diagram

Activity diagram in package 'Checkout sub System'

Checkout system

Version 1.0

邱依强 created on 2017/5/10. Last modified 2017/5/14



1. Checkout system

Create Oder

UseCase in package 'Checkout sub System'

Create Oder

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 创建订单

| SCENARIOS |
| --- |
| Basic Path. Basic Path  Network down  1. Input the goods  Uses:  Input goods  Exception: 1a. customer cancels buying  2. Match discount rules  Uses:  Discount match  3. calculate every amount  Uses:  Calculate amount  4. pay for the order  Uses:  Pay |
| Exception. customer cancels buying  1. remove goods NOT to buy  Uses:  Input goods |

| CONSTRAINTS |
| --- |
| Pre-condition. Already verified identity  Cashier or its generalization child has already verified his identity.  [ Proposed, Weight is 0. ] |

| CONNECTORS |
| --- |
| Include «include» Source -> Destination  From: Discount match : UseCase, Public  To: Create Oder : UseCase, Public |
| Include «include» Source -> Destination  From: Input goods : UseCase, Public  To: Create Oder : UseCase, Public |
| Include «include» Source -> Destination  From: Pay : UseCase, Public  To: Create Oder : UseCase, Public |

Customer INFO I/O

UseCase in package 'Checkout sub System'

Customer INFO I/O

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/11

Alias 读写顾客信息

| CONNECTORS |
| --- |
| Include «include» Source -> Destination  From: Customer INFO I/O : UseCase, Public  To: Discount match : UseCase, Public |

Discount match

UseCase in package 'Checkout sub System'

Discount match

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 促销匹配

| ELEMENTS OWNED BY Discount match |
| --- |
| <anonymous> : Instance |

| CONNECTORS |
| --- |
| Include «include» Source -> Destination  From: Discount match : UseCase, Public  To: Create Oder : UseCase, Public |
| Include «include» Source -> Destination  From: Customer INFO I/O : UseCase, Public  To: Discount match : UseCase, Public |

**Discount match diagram**

Interaction diagram in package 'Checkout sub System'

Discount match

Version 1.0

邱依强 created on 2017/5/11. Last modified 2017/5/14



1. Discount match

Input goods

UseCase in package 'Checkout sub System'

Input goods

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 录入商品

| CONNECTORS |
| --- |
| Include «include» Source -> Destination  From: Input goods : UseCase, Public  To: Create Oder : UseCase, Public |

Pay

UseCase in package 'Checkout sub System'

Pay

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/12

Alias 付款

| SCENARIOS |
| --- |
| Basic Path. Basic Path  [Payment sub system](#BKM_1A28038C_25B8_4E82_90AC_258D163A22E8) |

| CONNECTORS |
| --- |
| Include «include» Source -> Destination  From: Pay : UseCase, Public  To: Create Oder : UseCase, Public |

###### Payment sub system

Package in package 'Primary Use Cases'

Payment sub system

Version Phase 1.0 Proposed

created on 2017/5/10. Last modified 2017/5/10

Payment sub system diagram

Use Case diagram in package 'Payment sub system'

Payment sub system

Version 1.0

邱依强 created on 2017/5/10. Last modified 2017/5/10



1. Payment sub system

Alipay

UseCase in package 'Payment sub system'

Alipay

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 支付宝支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: Alipay : UseCase, Public  To: Normal payment : UseCase, Public |

Cash

UseCase in package 'Payment sub system'

Cash

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 现金支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: Cash : UseCase, Public  To: Normal payment : UseCase, Public |

Normal payment

UseCase in package 'Payment sub system'

Normal payment

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 普通支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: Wechat : UseCase, Public  To: Normal payment : UseCase, Public |
| Extend «extend» Source -> Destination  From: credit : UseCase, Public  To: Normal payment : UseCase, Public |
| Extend «extend» Source -> Destination  From: Alipay : UseCase, Public  To: Normal payment : UseCase, Public |
| Extend «extend» Source -> Destination  From: Cash : UseCase, Public  To: Normal payment : UseCase, Public |
| Extend «extend» Source -> Destination  From: card : UseCase, Public  To: Normal payment : UseCase, Public |

**Normal payment diagram**

Interaction diagram in package 'Payment sub system'

Normal payment

Version 1.0

邱依强 created on 2017/5/12. Last modified 2017/5/13



1. Normal payment

Wechat

UseCase in package 'Payment sub system'

Wechat

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 微信支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: Wechat : UseCase, Public  To: Normal payment : UseCase, Public |

card

UseCase in package 'Payment sub system'

card

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 银行卡支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: card : UseCase, Public  To: Normal payment : UseCase, Public |

credit

UseCase in package 'Payment sub system'

credit

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/14

Alias 积分支付

| CONNECTORS |
| --- |
| Extend «extend» Source -> Destination  From: credit : UseCase, Public  To: Normal payment : UseCase, Public |

###### Admin Cash side

UseCase in package 'Primary Use Cases'

Admin Cash side

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/12

Alias 管理收银侧

| SCENARIOS |
| --- |
| Basic Path. Basic Path  [Administrate sub system](#BKM_54698000_4D42_456D_A9AB_216C970721A9) |

###### ID Verify

UseCase in package 'Primary Use Cases'

ID Verify

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/10

Alias 身份验证

| SCENARIOS |
| --- |
| Basic Path. Basic Path  1. input username  Exception: 1a. username illegal  2. input password  3. click verify ID |
| Exception. username illegal    1. Notice user username illegal |

###### check out

UseCase in package 'Primary Use Cases'

check out

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/12

Alias 结算

| SCENARIOS |
| --- |
| Basic Path. Basic Path  [Checkout sub System](#BKM_E87029C8_D931_43B3_A372_05007AED65E6) |

###### payment

UseCase in package 'Primary Use Cases'

payment

Version 1.0 Phase 1.0 Proposed

邱依强 created on 2017/5/10. Last modified 2017/5/12

Alias 支付

| SCENARIOS |
| --- |
| Basic Path. Basic Path  [Payment sub system](#BKM_1A28038C_25B8_4E82_90AC_258D163A22E8) |

# 结语

通过使用UML技术，用活动图逐步深入了解促销系统在整个商场系统中的位置以及其自身应当扮演的角色、为了达成促销系统目标应当执行的步骤；用用例图在活动图的基础上，强化系统边界、得出系统用例、明确系统参与者，为下一步编码操作提供基础，同时也为简化了与用户之间的沟通。