2017

商场促销系统

数据库设计文档（PROPOSED VERSION）

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目录

1 介绍

1.1 目的

这篇文档是商场促销系统的数据库设计文档。本文档说明的过程是：在需求分析文档的基础之上，对需求分析中提出的用例模型（数据库概念模型）进行扩展，进一步细化细节后设计生成了本文档中的数据库逻辑模型和物理模型，使得系统在数据上能够直接有能够运行的数据库作为数据源支撑其业务层的运行。
作为促销系统的数据支撑，数据库需要存储并提供高效的数据变化支持，这些支持包括但不仅仅限于：促销规则、购物订单、购物付款单。

1.2 范围

这篇文档所介绍的内容范围紧紧围绕商场促销系统数据库建立所需要的分析和设计，包括其中数据库的逻辑模型和物理模型这两个重要的环节，以及建立数据库的 PL/SQL 脚本；除了数据库概念模型外（已经在需求分析用例部分体现），本文档还不包括与数据库关系不大的部分或非数据库中心的部分，如系统的设计、如何连接数据库等。

1.3 定义，缩写词

1. 促销系统：商场促销系统；
2. ERD/E-R 图：Entity-Relationship Diagram；
3. 逻辑模型：数据库逻辑模型；
4. 物理模型：数据库物理模型；
5. BuyFree：买 X 件减 Y 元优惠类型；
6. BuyCount：买 X 件打 Y 折优惠类型；
7. BuySpecial：买 X 件享受特价优惠类型；
8. BuyPresent：买 X 件赠送 Y 件商品或优惠券优惠类型；
9. FullFree：满 X 元减 Y 元优惠类型；
10. FullCount：满 X 元打 Y 折优惠类型；
11. FullPresent：满 X 元赠送 Y 件商品或优惠券优惠类型。

1.4 参考资料

1. 百度百科 - E-R 图

2. 百度百科 - 数据库逻辑模型
3. 百度百科 - 数据库物理模型

1.5 内容概览

1.5.1 逻辑模型

逻辑模型部分主要阐述促销系统中需要存储的各个实体，实体所具有的属性，实体与实体之间的各种关系以及在更新删除等等操作上各个实体之间应当是如何一致进行的。

1.5.2 物理模型

物理模型部分主要是在逻辑模型的基础之上，把逻辑模型中的实体、实体的属性以及实体间的关系分别映射到物理模型中的表、字段、外键概念，进而阐述如何将逻辑模型用于真实的 DBMS 中。

2 数据库设计表示方法

2.1 数据库设计范式

关系数据库中的关系必须满足一定的要求，即满足不同的范式。关系数据库有六种范式:第一范式(1NF)、第二范式(2NF)、第三范式(3NF)、巴德斯科范式(BCNF)、第四范式（4NF）和第五范式（5NF）。满足最低要求的范式是第一范式（1NF）。在第一范式的基础上进一步满足更多要求的称为第二范式（2NF），其余范式以次类推。一般说来，数据库只需满足第三范式（3NF）就行了。设计关系型数据库时，遵从不同的规范要求，设计出合理的关系型数据库。这些规范被称作范式。越高的范式数据库的冗余度就越低。其中第一范式的要求是：无重复的列；第二范式的要求是：属性完全依赖于主键；第三范式的要求是：无传递函数依赖。

2.2 ERD

E-R 图也称实体-联系图(Entity Relationship Diagram)，提供了表示实体类型、属性和联系的方法，用来描述现实世界的概念模型。
它是描述现实世界概念结构模型的有效方法。是表示概念模型的一种方式，用矩形表示实体型，矩形框内写明实体名；用椭圆表示实体的属性，并用无向边将其与相应的实体型连接起来；用菱形表示实体型之间的联系，在菱形框内写明联系

名，并用无向边分别与有关实体型连接起来，同时在无向边旁标上联系的类型（1:1,1:n 或 m:n）。

2.3 数据库逻辑设计

数据库逻辑设计是整个设计的前半段，包括所需的实体和关系，实体规范化等工作。此过程需要设计数据库的逻辑结构，逻辑设计模型与具体的 DBMS 无关，主要反映业务逻辑。在逻辑设计阶段，通用的设计方法是采用 ERD 来描绘实体与属性间的关系，设计最直接的体现即是 ERD。

2.4 数据库物理设计

设计数据库的物理结构，根据数据库的逻辑结构来选定 RDBMS（如 Oracle、Sybase 等），并设计和实施数据库的存储结构、存取方式等。数据库物理设计，包括选择数据库产品，确定数据库实体属性（字段）、数据类型、长度、精度确定、DBMS 页面大小等。物理结构依赖于给定的 DBMS 和和硬件系统，因此设计人员必须充分了解所用 RDBMS 的内部特征、存储结构、存取方法。数据库的物理设计通常分为两步，第一，确定数据库的物理结构，第二，评价实施空间效率和时间效率
确定数据库的物理结构包含下面四方面的内容：

1. 确定数据的存储结构
2. 设计数据的存取路径
3. 确定数据的存放位置
4. 确定系统配置

数据库物理设计过程中需要对时间效率、空间效率、维护代价和各种用户要求进行权衡，选择一个优化方案作为数据库物理结构。在数据库物理设计中，最有效的方式是集中地存储和检索对象。

3 DBMS 环境

促销系统采用 Oracle 12c 数据库系统，用户、表空间等的建立都应符合此版本的 DBMS 要求。

4 数据库设计逻辑模型

5 数据库设计物理模型

5.1 Data Model - Oracle

Package «DataModel» in package 'Model'

Data Model - Oracle
Version 1.0 Phase 1.0 Proposed
EA created on 2017/5/20. Last modified 2014/6/19
Alias

5.2 User and TableSpace

User and tablespace
Version 1.0
邱依强 created on 2017/5/20. Last modified 2017/5/20

```
-- create user
/*
   ATTENTION:
            Change passcode if NECCESARY!
            Passcode should be the same as the programming side.
*/
create user C##Promotion identified by arvinsichuan;

-- create tablespace
/* ATTENTION:
            Please create the dir:'C:\oracle\DB FILE\'
            or change the datafile uri to your customized directory.
*/
create tablespace promotion
datafile 'C:\oracle\DB FILE\promotion.dat' size 50M
autoextend on next 5M;
-- grant tablespace to user
```

```
alter user c##promotion default tablespace promotion;
alter user C##PROMOTION quota unlimited on promotion;

-- granting privilegs
grant
    create session,
    create tablespace,
    create any index,
    create any procedure,
    create any table,
    create any sequence,
    create any trigger,
    create any view,
    create rollback segment,
    alter any index,
    alter any table,
    alter any sequence,
    alter any trigger,
    alter any procedure,
    backup any table,
    drop any index,
    drop any procedure,
    drop any table,
    drop any view,
    drop any trigger,
    insert any table,
    update any table,
    delete any table ,
    select any table
to
    c##promotion;
```

5.3 Data Model - Oracle diagram

Data Modeling diagram in package 'Data Model - Oracle'

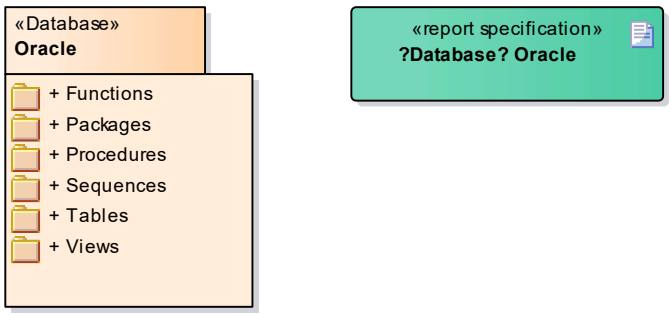

Figure 2: Data Model - Oracle

5.4 Packages

Package in package 'Oracle'

Packages
Version 1.0 Phase 1.0 Proposed
EA created on 2017/5/20. Last modified 2017/5/20
Alias

5.4.1 Packages diagram

Data Modeling diagram in package 'Packages'

Packages
Version 1.0
邱依强 created on 2017/5/20. Last modified 2017/5/30

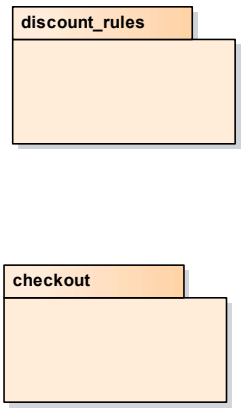

Figure 3: Packages

5.4.2 checkout

Package in package 'Packages'

checkout
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/30. Last modified 2017/5/30
Alias

5.4.3 checkout diagram

Data Modeling diagram in package 'checkout'

checkout
Version 1.0
邱依强 created on 2017/5/30. Last modified 2017/5/30

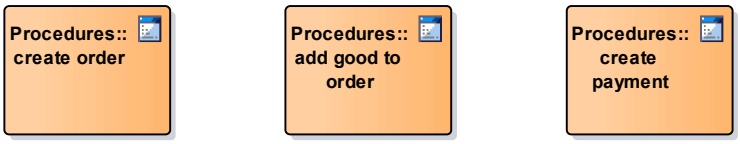

Figure 4: checkout

```
CREATE OR REPLACE PACKAGE checkout
is
PROCEDURE create_order(em in orders.EM_ID%TYPE,uuid out orders.Order_ID%type);
PROCEDURE add_good_to_order(good in saled_goods%rowtype);
PROCEDURE remove_good_from_order(id in saled_goods.Good_ID%type,oid in
saled_goods.Order_ID%type);
PROCEDURE create_payment
    (sum in payments.Payment_Sum%type,
    channel_id in payments.PAYMENT_CHANNELSIDE_ID%type,
    channel in payments.Payment_Channel%type,
    em in payments.EM_ID%type,
    order_id in orders.Order_ID%type,
    id out payments.Payment_ID%type);
end checkout;


CREATE OR REPLACE PACKAGE BODY checkout
as
PROCEDURE create_order
    (em in orders.EM_ID%TYPE,uuid out orders.Order_ID%type)
AS
    -- create an order
BEGIN
    select
    to_char(sysdate,'YYYYMMDDHH24MISS')||to_char(seq_order.nextval,'fm00000000000000
0000')
    into uuid
    from dual;
    insert into orders
    (order_id,order_sum,sum_money,order_status,em_id)
    values
```

```
    (uuid,0,0,'inited',em);
END create_order;



PROCEDURE add_good_to_order
    (good in saled_goods%rowtype)
AS
    -- import goods
BEGIN
    insert into saled_goods
    (good_id,saled_date,sum,price,order_id)
    values
    (good.good_id,good.saled_date,good.sum,good.price,good.order_id);
END add_good_to_order;

PROCEDURE remove_good_from_order
    (id in saled_goods.Good_ID%type,oid in saled_goods.Order_ID%type)
AS
    -- import goods
BEGIN
    delete from saled_goods where good_id = id and order_id = oid;
END remove_good_from_order;

PROCEDURE create_payment
    (sum in payments.Payment_Sum%type,
    channel_id in payments.PAYMENT_CHANNELSIDE_ID%type,
    channel in payments.Payment_Channel%type,
    em in payments.EM_ID%type,
    order_id in orders.Order_ID%type,
    id out payments.Payment_ID%type)
AS
    -- create new payment
BEGIN
    select
    to_char(sysdate,'YYYYMMDDHH24MISS')||to_char(seq_payment.nextval,'fm000000000000
000000')
    into id
    from dual;
    insert into payments
    (payment_id,payment_sum,PAYMENT_CHANNELSIDE_ID,payment_channel,em_id)
    values
```

```
    (id,sum,channel_id,channel,em);
    update orders
    set payment_id=id
    where order_id=order_id;
END;

end checkout;
show error;
```

5.4.4 discount_rules

Package in package 'Packages'

discount_rules
Version 1.0　Phase 1.0　提议的
邱依强 created on 2017/5/30.　Last modified 2017/5/30
Alias

discount_rules diagram

Data Modeling diagram in package 'discount_rules'

discount_rules
Version 1.0
邱依强 created on 2017/5/30.　Last modified 2017/5/30

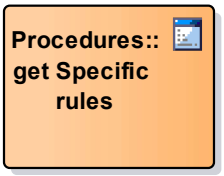

Figure 5:　discount_rules

```
CREATE OR REPLACE PACKAGE discount_rule
AS
PROCEDURE get_Specific_rules(type in discount_rules.Rule_Type%type,rules out
discount_rules%rowtype);

END discount_rule;



CREATE OR REPLACE PACKAGE BODY discount_rule
AS
PROCEDURE get_Specific_rules
    (type in discount_rules.Rule_Type%type,rules out discount_rules%rowtype)
AS
    -- get Buy Free Rules
BEGIN
    select * into rules from discount_rules where rule_type=type;
END get_Specific_rules;
END discount_rule;

SHOW ERROR;
```

5.5 Sequences

Package in package 'Oracle'

Sequences
Version 1.0 Phase 1.0 Proposed
EA created on 2017/5/20. Last modified 2017/5/20
Alias

5.5.1 Sequences diagram

Data Modeling diagram in package 'Sequences'

Sequences
Version 1.0
邱依强 created on 2017/5/20. Last modified 2017/5/21

Figure 6: Sequences

5.5.2 Seq_Order

Database «dbsequence» in package 'Sequences'

Order Auto Increment Sequence

Seq_Order
Version 1.0 Phase 1.0
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

```
create sequence order_seq
start with 1
increment by 1
maxvalue 9999999999999999
minvalue 1
cycle
cache 64
```

5.5.3 Payment_Seq

Database «dbsequence» in package 'Sequences'

Payment Auto increment Sequence

Seq_Payment
Version 1.0 Phase 1.0
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

```
create sequence Seq_Payment
start with 1
increment by 1
maxvalue 9999999999999999
minvalue 1
cycle
cache 32
```

5.6 Tables

Package in package 'Oracle'

Tables
Version 1.0 Phase 1.0 Proposed
EA created on 2017/5/20. Last modified 2017/5/20
Alias

5.6.1 Tables diagram

Class diagram in package 'Tables'

Tables
Version 1.0
邱依强 created on 2017/5/21. Last modified 2017/5/30

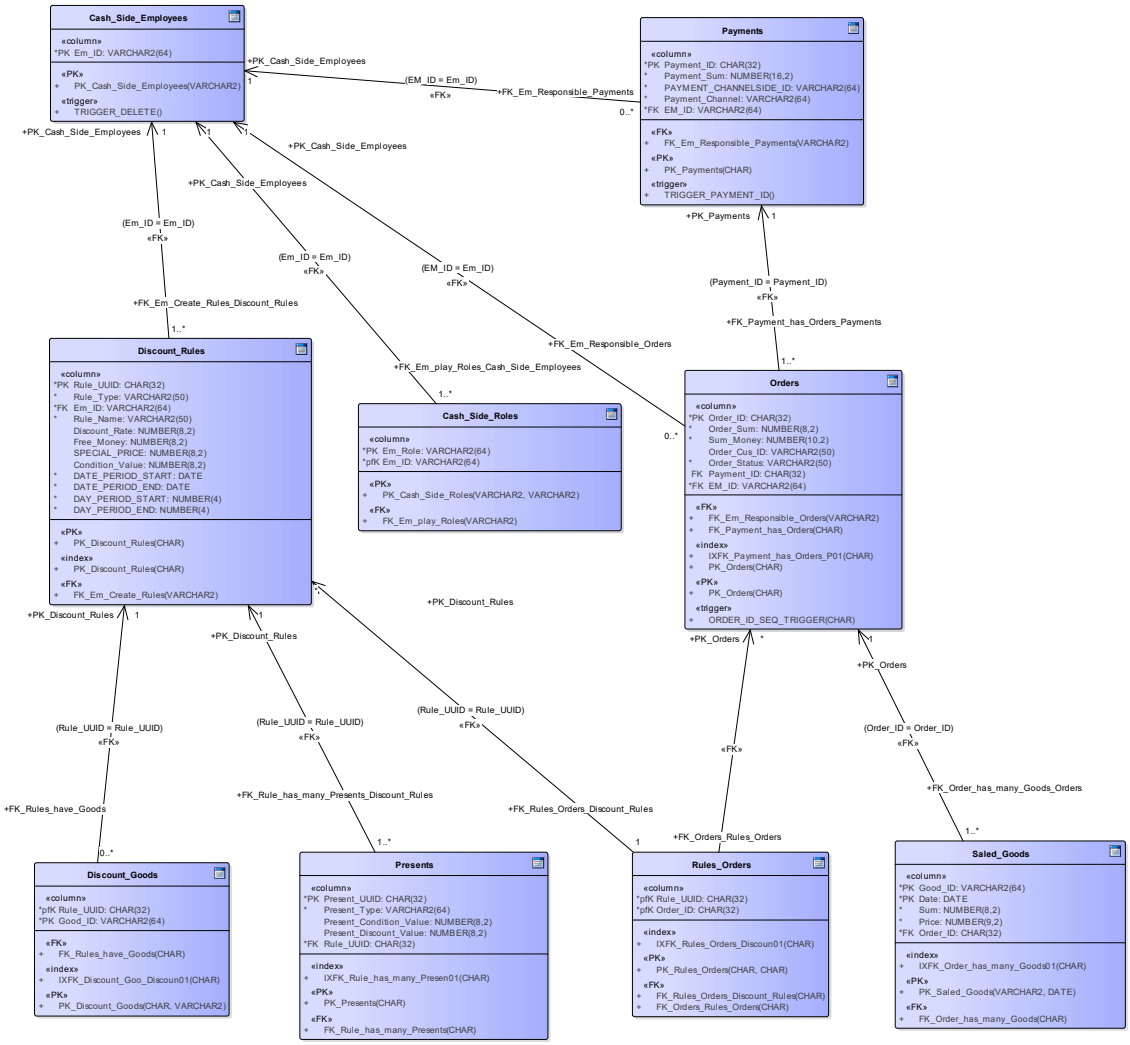

Figure 7: Tables

5.6.2 Cash_Side_Employees

Database table in package 'Tables'

Cash_Side_Employees
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Em_ID	VARCHAR2(64)	True	员工号

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Cash_Side_Employees	Em_ID	

TRIGGER NAME	COMMENTS
TRIGGER_DELETE	员工删除同步数据处理触发器

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'CASH_SIDE_EMPLOYEES' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE CASH_SIDE_EMPLOYEES CASCADE CONSTRAINTS';
END IF;
END;



/* Create Tables */
```

```
CREATE TABLE Cash_Side_Employees
(
    Em_ID VARCHAR2(64) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

create or replace trigger trigger_em_delete
    before delete on cash_side_employees
    for each row
declare
    marker int;
    delete_mark_emid cash_side_employees.Em_ID%type;

begin
    select count(*) into marker from new where emid = '________';
    if marker < 0 then
        insert into new values ('________');
    end if;
    update orders set EM_ID= '________' where emid=old.emid;
    update payments set EM_ID= '________' where emid=old.emid;
    update discount_rules set EM_ID= '________' where emid=old.emid;
end trigger_em_delete;



SHOW ERRORS
;

ALTER TABLE Cash_Side_Employees
 ADD CONSTRAINT PK_Cash_Side_Employees
    PRIMARY KEY (Em_ID) USING INDEX
;

desc Cash_Side_Employees

insert into cash_side_employees
(em_id)
values
('________');
```

5.6.3 Cash_Side_Roles

Database table in package 'Tables'

Cash_Side_Roles
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Em_Role	VARCHAR2(64)	True	员工角色
Em_ID	VARCHAR2(64)	True	员工号

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Cash_Side_Roles	Em_Role, Em_ID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Em_play_Roles_Cash_Side_Employees	Em_ID	Cash_Side_Employees(Em_ID)

```
/* ------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ------------------------------------------------- */
```

```
/* Drop Tables */
DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'CASH_SIDE_ROLES' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE CASH_SIDE_ROLES CASCADE CONSTRAINTS';
END IF;
END;



/* Create Tables */

CREATE TABLE Cash_Side_Roles
(
    Em_Role VARCHAR2(64) NOT NULL,
    Em_ID VARCHAR2(64) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

ALTER TABLE Cash_Side_Roles
 ADD CONSTRAINT PK_Cash_Side_Roles
    PRIMARY KEY (Em_Role,Em_ID) USING INDEX
;

/* Create Foreign Key Constraints */

ALTER TABLE Cash_Side_Roles
 ADD CONSTRAINT FK_Em_play_Roles
    FOREIGN KEY (Em_ID) REFERENCES Cash_Side_Employees(Em_ID) ON DELETE Cascade
;

INSERT INTO CASH_SIDE_ROLES
(em_role,em_id)
values
('Deleted','________');
```

5.6.4 Discount_Goods

Database table in package 'Tables'

Discount_Goods
Version 1.0　Phase 1.0　提议的
邱依强 created on 2017/5/21.　Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Rule_UUID	CHAR(32)	True	规则序列号
Good_ID	VARCHAR2(64)	True	货物号

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Discount_Goods	Rule_UUID, Good_ID	

TYPE / NAME	COLUMNS	COMMENTS
«index» IXFK_Discount_Goo_Discoun01	Rule_UUID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Rules_have_Goods	Rule_UUID	Discount_Rules(Rule_UUID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'DISCOUNT_GOODS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE DISCOUNT_GOODS CASCADE CONSTRAINTS';
END IF;
END;




/* Create Tables */

CREATE TABLE Discount_Goods
(
    Rule_UUID CHAR(32) NOT NULL,
    Good_ID VARCHAR2(64) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

CREATE INDEX IXFK_Discount_Goo_Discoun01
 ON Discount_Goods(Rule_UUID)
;

ALTER TABLE Discount_Goods
 ADD CONSTRAINT PK_Discount_Goods
    PRIMARY KEY (Rule_UUID,Good_ID) USING INDEX
;
```

```
/* Create Foreign Key Constraints */

ALTER TABLE Discount_Goods
 ADD CONSTRAINT FK_Rules_have_Goods
    FOREIGN KEY (Rule_UUID) REFERENCES Discount_Rules (Rule_UUID)
;
```

5.6.5 Discount_Rules

Database table in package 'Tables'

Discount_Rules
Version 1.0　Phase 1.0　提议的
邱依强 created on 2017/5/21.　Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Rule_UUID	CHAR(32)	True	规则序列号
Rule_Type	VARCHAR2(50)	True	规则类型
Em_ID	VARCHAR2(64)	True	创建者员工号
Rule_Name	VARCHAR2(50)	True	规则名称
Discount_Rate	NUMBER(8,2)	False	折扣率
Free_Money	NUMBER(8,2)	False	减免金额

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
SPECIAL_PRICE	NUMBER(8,2)	False	特价值
Condition_Value	NUMBER(8,2)	False	条件值
DATE_PERIOD_START	DATE	True	开始日期
DATE_PERIOD_END	DATE	True	结束日期
DAY_PERIOD_START	NUMBER(4)	True	开始时刻
DAY_PERIOD_END	NUMBER(4)	True	结束时刻

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Discount_Rules	Rule_UUID	

TYPE / NAME	COLUMNS	COMMENTS
«index» PK_Discount_Rules	Rule_UUID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Em_Create_Rules_Discount_Rules	Em_ID	Cash_Side_Employees(Em_ID)


```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested      */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'DISCOUNT_RULES' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE DISCOUNT_RULES CASCADE CONSTRAINTS';
END IF;
END;




/* Create Tables */

CREATE TABLE Discount_Rules
(
    Rule_UUID CHAR(32) NOT NULL,
    Rule_Type VARCHAR2(50) NOT NULL,
    Em_ID VARCHAR2(64) NOT NULL,
    Rule_Name VARCHAR2(50) NOT NULL,
    Discount_Rate NUMBER(8,2),
    Free_Money NUMBER(8,2),
    SPECIAL_PRICE NUMBER(8,2),
    Condition_Value NUMBER(8,2),
    DATE_PERIOD_START DATE NOT NULL,
    DATE_PERIOD_END DATE NOT NULL,
    DAY_PERIOD_START NUMBER(4) NOT NULL,
    DAY_PERIOD_END NUMBER(4) NOT NULL
```

```
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

CREATE INDEX PK_Discount_Rules
 ON Discount_Rules (Rule_UUID)
;

ALTER TABLE Discount_Rules
 ADD CONSTRAINT PK_Discount_Rules
    PRIMARY KEY (Rule_UUID) USING INDEX
;

/* Create Foreign Key Constraints */

ALTER TABLE Discount_Rules
 ADD CONSTRAINT FK_Em_Create_Rules
    FOREIGN KEY (Em_ID) REFERENCES Cash_Side_Employees (Em_ID)
;
```

5.6.6 Orders

Database table in package 'Tables'

Orders
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Order_ID	CHAR(32)	True	
Order_Sum	NUMBER(8,2)	True	

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Sum_Money	NUMBER(10,2)	True	
Order_Cus_ID	VARCHAR2(50)	False	
Order_Status	VARCHAR2(50)	True	
Payment_ID	CHAR(32)	False	
EM_ID	VARCHAR2(64)	True	

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Orders	Order_ID	

TYPE / NAME	COLUMNS	COMMENTS
«index» IXFK_Payment_has_Orders_P01	Payment_ID	
«index» PK_Orders	Order_ID	

TRIGGER NAME	COMMENTS
ORDER_ID_SEQ_TRIGGER	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Payment_has_Orders_Payments	Payment_ID	

		Payments(Payment_ID)
FK_Em_Responsible_Orders	EM_ID	Cash_Side_Employees(Em_ID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */
DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'ORDERS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE ORDERS CASCADE CONSTRAINTS';
END IF;
END;



/* Create Tables */

CREATE TABLE Orders
(
    Order_ID CHAR(32) NOT NULL,
    Order_Sum NUMBER(8,2) NOT NULL,
    Sum_Money NUMBER(10,2) NOT NULL,
    Order_Cus_ID VARCHAR2(50),
    Order_Status VARCHAR2(50) NOT NULL,
    Payment_ID CHAR(32),
    EM_ID VARCHAR2(64) NOT NULL
)
```

```
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

CREATE INDEX IXFK_Payment_has_Orders_P01
 ON Orders(Payment_ID)
;

CREATE INDEX PK_Orders
 ON Orders(Order_ID)
;

ALTER TABLE orders
 ADD CONSTRAINT PK_Orders
    PRIMARY KEY (Order_id) USING INDEX
;



create or replace trigger trigger_order_id_seq
  before insert on orders
  for each row
declare
  nextid orders.Order_ID%TYPE;
begin
  IF :new.Order_ID IS NULL or :new.Order_ID='00000000000000000000000000000000' THEN
    select
    to_char(sysdate,'YYYYMMDDHH24MISS')||to_char(seq_order.nextval,'fm000000000000000
000')
    into nextid
    from dual;
    :new.Order_ID:=nextid;
  end if;
end trigger_order_id_seq;

SHOW ERRORS
;

/* Create Foreign Key Constraints */

ALTER TABLE Orders
 ADD CONSTRAINT FK_Em_Responsible_Orders
```

```
    FOREIGN KEY (EM_ID) REFERENCES Cash_Side_Employees (Em_ID)
;


ALTER TABLE Orders
 ADD CONSTRAINT FK_Payment_has_Orders
    FOREIGN KEY (Payment_ID) REFERENCES Payments (Payment_ID)
;
```

5.6.7 Payments

Database table in package 'Tables'

Payments
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Payment_ID	CHAR(32)	True	
Payment_Sum	NUMBER(16,2)	True	
PAYMENT_CHANNELSIDE_ID	VARCHAR2(64)	True	
Payment_Channel	VARCHAR2(64)	True	
EM_ID	VARCHAR2(64)	True	

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Payments	Payment_ID	

TRIGGER NAME	COMMENTS
TRIGGER_PAYMENT_ID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Em_Responsible_Payments	EM_ID	Cash_Side_Employees(Em_ID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'PAYMENTS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE Payments CASCADE CONSTRAINTS';
END IF;
END;




/* Create Tables */
```

```
CREATE TABLE Payments
(
    Payment_ID CHAR(32) NOT NULL,
    Payment_Sum NUMBER(16,2) NOT NULL,
    PAYMENT_CHANNELSIDE_ID VARCHAR2(64) NOT NULL,
    Payment_Channel VARCHAR2(64) NOT NULL,
    EM_ID VARCHAR2(64) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

create or replace trigger trigger_payment_id
  before insert on payments
  for each row
declare
  nextid payments.Payment_ID%TYPE;
begin
  IF :new.payment_id IS NULL or :new.payment_id='00000000000000000000000000000000'
THEN
    select
    to_char(sysdate,'YYYYMMDDHH24MISS')||to_char(seq_payment.nextval,'fm0000000000000
00000')
    into nextid
    from dual;
    :new.payment_id:=nextid;
  end if;
end trigger_payment_id;


SHOW ERRORS


ALTER TABLE Payments
 ADD CONSTRAINT PK_Payments
    PRIMARY KEY (Payment_ID) USING INDEX
;

/* Create Foreign Key Constraints */
```

```
ALTER TABLE Payments
 ADD CONSTRAINT FK_Em_Responsible_Payments
    FOREIGN KEY (EM_ID) REFERENCES Cash_Side_Employees (Em_ID)
;
```

5.6.8 Presents

Database table in package 'Tables'

Presents
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Present_UUID	CHAR(32)	True	
Present_Type	VARCHAR2(64)	True	
Present_Condition_Value	NUMBER(8,2)	False	
Present_Discount_Value	NUMBER(8,2)	False	
Rule_UUID	CHAR(32)	True	

PRIMARY KEY NAME	COLUMNS	COMMENTS

PK_Presents	Present_UUID	

TYPE / NAME	COLUMNS	COMMENTS
«index» IXFK_Rule_has_many_Presen01	Rule_UUID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Rule_has_many_Presents_Discount_Rules	Rule_UUID	Discount_Rules(Rule_UUID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                    */
/*  DBMS       : Oracle                                 */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'PRESENTS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE PRESENTS CASCADE CONSTRAINTS';
END IF;
END;

/* Create Tables */

CREATE TABLE Presents
(
```

```
    Present_UUID CHAR(32) NOT NULL,
    Present_Type VARCHAR2(64) NOT NULL,
    Present_Condition_Value NUMBER(8,2),
    Present_Discount_Value NUMBER(8,2),
    Rule_UUID CHAR(32) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

CREATE INDEX IXFK_Rule_has_many_Presen01
 ON Presents (Rule_UUID)
;

ALTER TABLE Presents
 ADD CONSTRAINT PK_Presents
    PRIMARY KEY (Present_UUID) USING INDEX
;

/* Create Foreign Key Constraints */

ALTER TABLE Presents
 ADD CONSTRAINT FK_Rule_has_many_Presents
    FOREIGN KEY (Rule_UUID) REFERENCES Discount_Rules (Rule_UUID)
;
```

5.6.9 Rules_Orders

Database table in package 'Tables'

Rules_Orders
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Rule_UUID	CHAR(32)	True	
Order_ID	CHAR(32)	True	

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Rules_Orders	Rule_UUID, Order_ID	

TYPE / NAME	COLUMNS	COMMENTS
«index» IXFK_Rules_Orders_Discoun01	Rule_UUID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Rules_Orders_Discount_Rules	Rule_UUID	Discount_Rules(Rule_UUID)
FK_Orders_Rules_Orders	Order_ID	Orders(Order_ID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                    */
/*  DBMS       : Oracle                                 */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */

DECLARE
  C NUMBER;
```

```
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'RULES_ORDERS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE RULES_ORDERS CASCADE CONSTRAINTS';
END IF;
END;

/* Create Tables */

CREATE TABLE Rules_Orders
(
    Rule_UUID CHAR(32) NOT NULL,
    Order_ID CHAR(32) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */

CREATE INDEX IXFK_Rules_Orders_Discoun01
 ON Rules_Orders (Rule_UUID)
;

ALTER TABLE Rules_Orders
 ADD CONSTRAINT PK_Rules_Orders
    PRIMARY KEY (Rule_UUID,Order_ID) USING INDEX
;

/* Create Foreign Key Constraints */

ALTER TABLE Rules_Orders
 ADD CONSTRAINT FK_Rules_Orders_Discount_Rules
    FOREIGN KEY (Rule_UUID) REFERENCES Discount_Rules (Rule_UUID)
;

ALTER TABLE Rules_Orders
 ADD CONSTRAINT FK_Orders_Rules_Orders
    FOREIGN KEY (Order_ID) REFERENCES Orders (Order_ID)
;
```

5.6.10 Saled_Goods

Database table in package 'Tables'

Saled_Goods
Version 1.0 Phase 1.0 提议的
邱依强 created on 2017/5/21. Last modified 2017/5/30
DBMS Oracle

COLUMN NAME	DATATYPE	NOT NULL	COMMENTS
Good_ID	VARCHAR2(64)	True	
Date	DATE	True	
Sum	NUMBER(8,2)	True	
Price	NUMBER(9,2)	True	
Order_ID	CHAR(32)	True	

PRIMARY KEY NAME	COLUMNS	COMMENTS
PK_Saled_Goods	Good_ID, Date	

TYPE / NAME	COLUMNS	COMMENTS
«index» IXFK_Order_has_many_Goods01	Order_ID	

FOREIGN KEY NAME	COLUMNS	REFERENCES
FK_Order_has_many_Goods_Orders	Order_ID	Orders(Order_ID)

```
/* ---------------------------------------------------- */
/*  Generated by Enterprise Architect Version 12.0      */
/*  Created On : 30-05-2017 16:23:08                */
/*  DBMS      : Oracle                           */
/*  Grammer Checked and Tested       */
/* ---------------------------------------------------- */

/* Drop Tables */
DECLARE
  C NUMBER;
BEGIN
SELECT COUNT(*) INTO C
FROM USER_TABLES
  WHERE TABLE_NAME = 'SALED_GOODS' ;
  IF (C > 0) THEN
    EXECUTE IMMEDIATE 'DROP TABLE SALED_GOODS CASCADE CONSTRAINTS';
END IF;
END;



/* Create Tables */

CREATE TABLE Saled_Goods
(
    Good_ID VARCHAR2(64) NOT NULL,
    Saled_Date DATE NOT NULL,
    Sum NUMBER(8,2) NOT NULL,
    Price NUMBER(9,2) NOT NULL,
    Order_ID CHAR(32) NOT NULL
)
;

/* Create Primary Keys, Indexes, Uniques, Checks, Triggers */
```

```
CREATE INDEX IXFK_Order_has_many_Goods01
 ON Saled_Goods (Order_ID)
;

ALTER TABLE Saled_Goods
 ADD CONSTRAINT PK_Saled_Goods
    PRIMARY KEY (Good_ID,Saled_Date) USING INDEX
;

/* Create Foreign Key Constraints */

ALTER TABLE Saled_Goods
 ADD CONSTRAINT FK_Order_has_many_Goods
    FOREIGN KEY (Order_ID) REFERENCES Orders (Order_ID) ON DELETE CASCADE
;
```