

哈尔滨工业大学 计算学部
2024 年秋季学期《开源软件开发实践》
Lab5 基于低代码平台的软件开发

学号	姓名	联系方式
2022212005	张沣睿	donniezfr@foxmail.com/15009886706

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1 实验要求

本次实验训练典型低代码平台的使用和利用低代码平台开发程序，具体来说：

- 掌握典型低代码平台 inBuilder 的使用
- 能够利用 inBuilder 平台进行软件产品的开发
- 熟悉 UBML 开源项目

2 掌握 inBuilder 低代码开发平台的使用

2.1 入门开发

2.1.1 开发环境搭建

安装 Java 环境

```
PS C:\Users\Donnie> java -version
java version "21.0.5" 2024-10-15 LTS
Java(TM) SE Runtime Environment (build 21.0.5+9-LTS-239)
Java HotSpot(TM) 64-Bit Server VM (build 21.0.5+9-LTS-239, mixed mode, sharing)
```

安装 Farris 开发环境

```
PS C:\Users\Donnie> node --version
v17.9.1
PS C:\Users\Donnie> npm --version
npm [WARN config global `--global`, `--local` are deprecated. Use `--location=global` instead.
8.11.0
PS C:\Users\Donnie> jit --version
1.3.144
PS C:\Users\Donnie> ng --version
```



```
Angular CLI: 7.3.9
Node: 17.9.1
OS: win32 x64
Angular:
...
Package          Version
-----
@angular-devkit/architect    0.13.9
@angular-devkit/core         7.3.9
@angular-devkit/schematics   7.3.9
@schematics/angular          7.3.9
@schematics/update           0.13.9
rxjs                          6.3.3
typescript                   3.2.4
```

安装数据库

```
PS C:\Users\Donnie> mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.32 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> |
```

环境初始

```
15:58:46.059 [main] INFO io.iec.edp.caf.common.runtime.msu.ServiceUnitConfigService - Enable service units: [DF,Order,pfcommon,main,aif,audit,Bcc,Chgdr,Prt,COMMENT,rtcommon,cs,csb,dfs,dip,ebs,epp,Ewp,Icc,inBot,iotfnd,Lcm,mcf,msg,nocode,pal,portal,rri,Schd,sg,Sys,task,Trace,wf]

:: Enterprise Digitalization Capabilities Platform ::

Powered by Cloud Application Foundation Server v5.0

PROCESSOR_ARCH: AMD64
JAVA_HOME: F:\Develop\inbuilder_community_2406_x86_64_build20240630\server\runtime\java\AMD64-win
JRE_HOME: F:\Develop\inbuilder_community_2406_x86_64_build20240630\server\runtime\java\AMD64-win
JAVA_VERSION: 1.8.0_222
IGIX_SERVER_HOME: F:\Develop\inbuilder_community_2406_x86_64_build20240630\server
SPRING_BOOT: 2.4.13 (v2.4.13)
ACTIVE_PROFILES: prod
PROCESS_ID: 38920
TOTAL_MEMORYSIZE: ${TotalMemorySize}

2024-11-12 16:01:11.261 All rest endpoints have already been registered. Now running on: 5200
2024-11-12 16:01:13.742 The iGIX server has started successfully in 149.417 seconds, Now listening on:5200 (http)
```

```
PS E:\Program Files\inbuilder_community_2406_x86_64_build20240630> .\startup-win.cmd
17:03:23.859 [main] INFO io.iec.edp.caf.common.runtime.msu.ServiceUnitConfigService - Enable service units: [DF,Order,pfcommon,main,aif,audit,Bcc,Chgdr,Prt,COMMENT,rtcommon,cs,csb,dfs,dip,ebs,epp,Ewp,Icc,inBot,iotfnd,Lcm,mcf,msg,nocode,pal,portal,rri,Schd,sg,Sys,task,Trace,wf]

:: Enterprise Digitalization Capabilities Platform ::

Powered by Cloud Application Foundation Server v5.0

PROCESSOR_ARCH: AMD64
JAVA_HOME: E:\Program Files\inbuilder_community_2406_x86_64_build20240630\server\runtime\java\AMD64-win
JRE_HOME: E:\Program Files\inbuilder_community_2406_x86_64_build20240630\server\runtime\java\AMD64-win
JAVA_VERSION: 1.8.0_222
IGIX_SERVER_HOME: E:\Program Files\inbuilder_community_2406_x86_64_build20240630\server
SPRING_BOOT: 2.4.13 (v2.4.13)
ACTIVE_PROFILES: prod
PROCESS_ID: 32420
TOTAL_MEMORYSIZE: ${TotalMemorySize}

请按任意键继续. . .
```

用户初始

The screenshot shows the 'User Information' form in a low-code platform. The 'Organization Position' tab is selected. The user has been successfully saved. The assigned position is 'Developer'.

序号	岗位编号	岗位名称
1	dev	开发岗

The screenshot shows the 'User Information' form in a low-code platform. The 'Organization Position' tab is selected. The user has been successfully saved. The assigned position is 'Developer'.

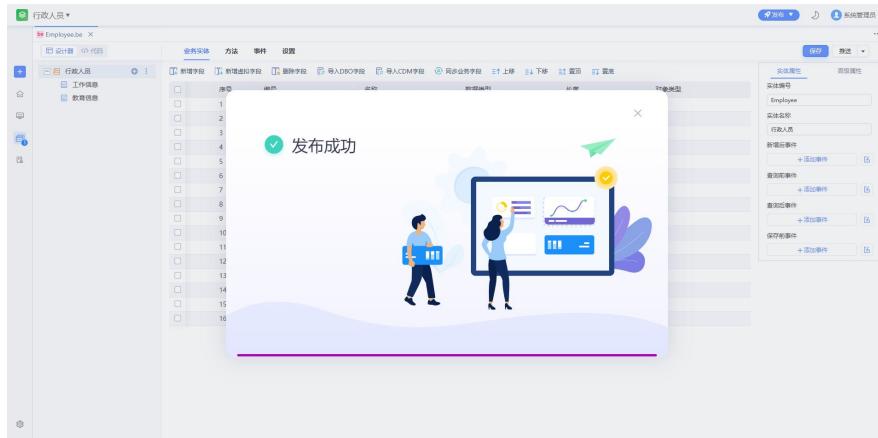
序号	岗位编号	岗位名称
1	dev	开发岗

配置初始

The screenshot shows the 'My Applications' section of the low-code platform. It lists several applications: 'Organization' (行政组织), 'Employees' (行政人员), 'Merchant' (商户), and 'Goods' (商品). A blue button at the bottom left says '+ 创建应用' (Create Application).

2.1.2 五分钟上手 inBuilder 开发

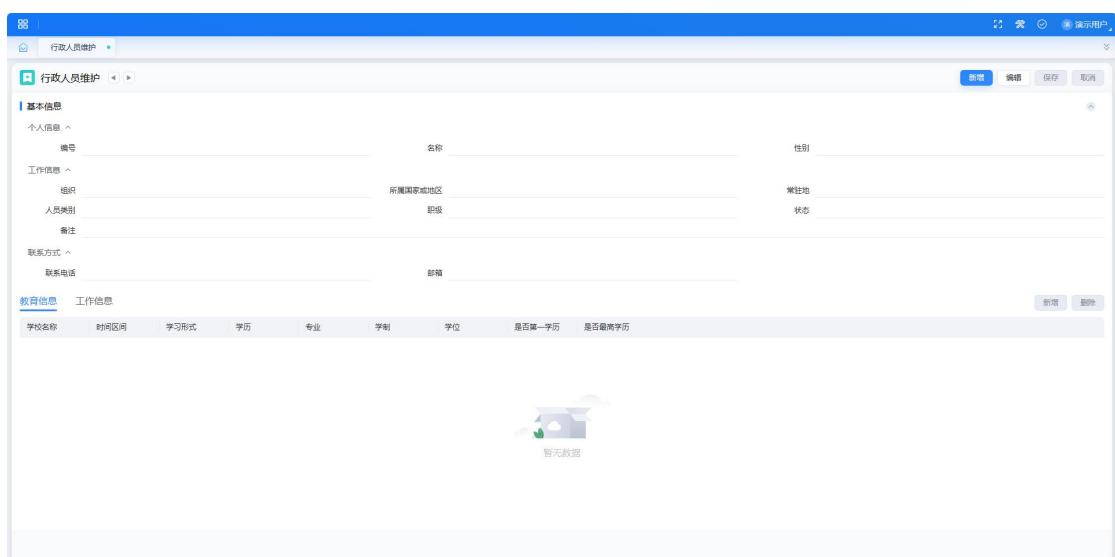
实体建模



前端页面建模



功能菜单发布



2.2 进阶开发

2.2.1 字段属性配置

功能菜单发布



2.2.2 如何设置字段分组

完成设置分组后发布



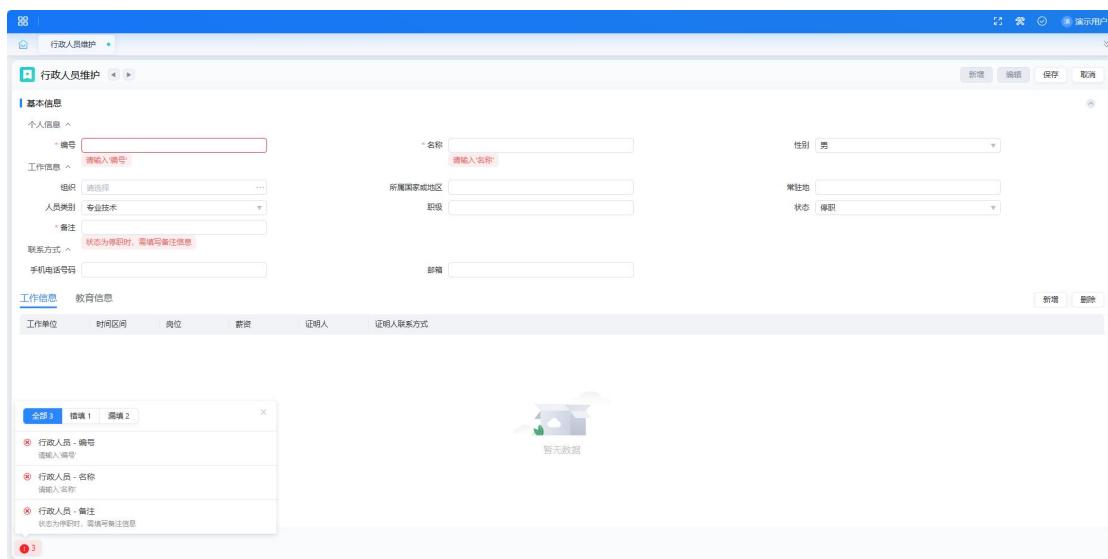
运行效果

2.2.3 如何配置必填表达式

配置必填表达式后发布

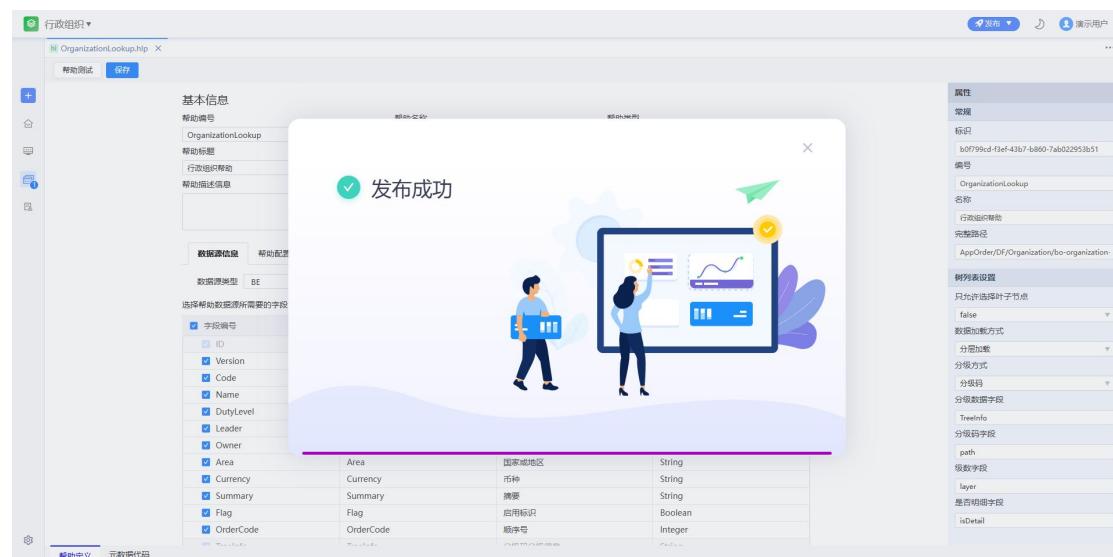


运行效果

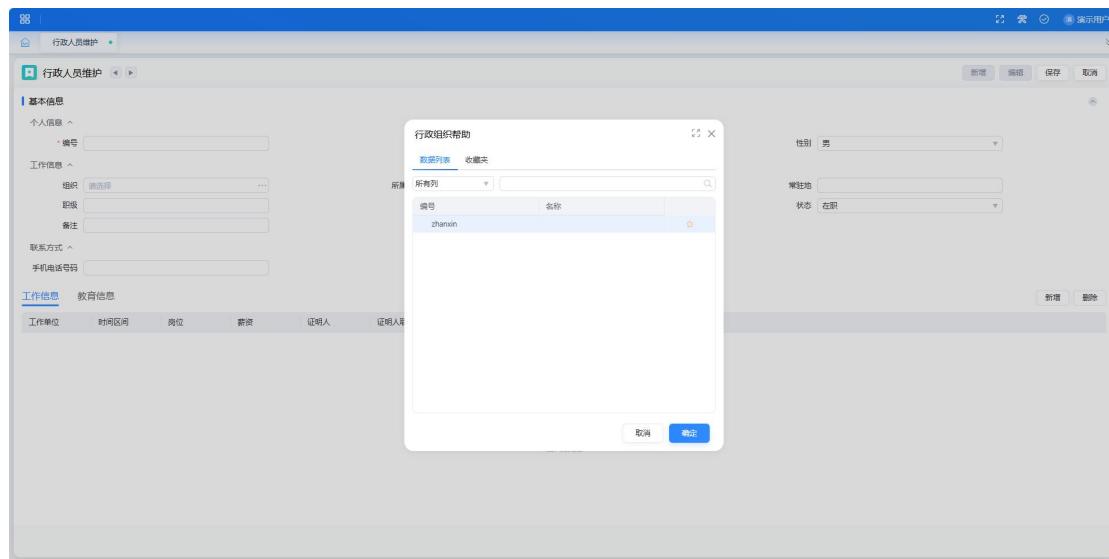


2.2.4 如何创建和使用智能帮助

智能帮助发布

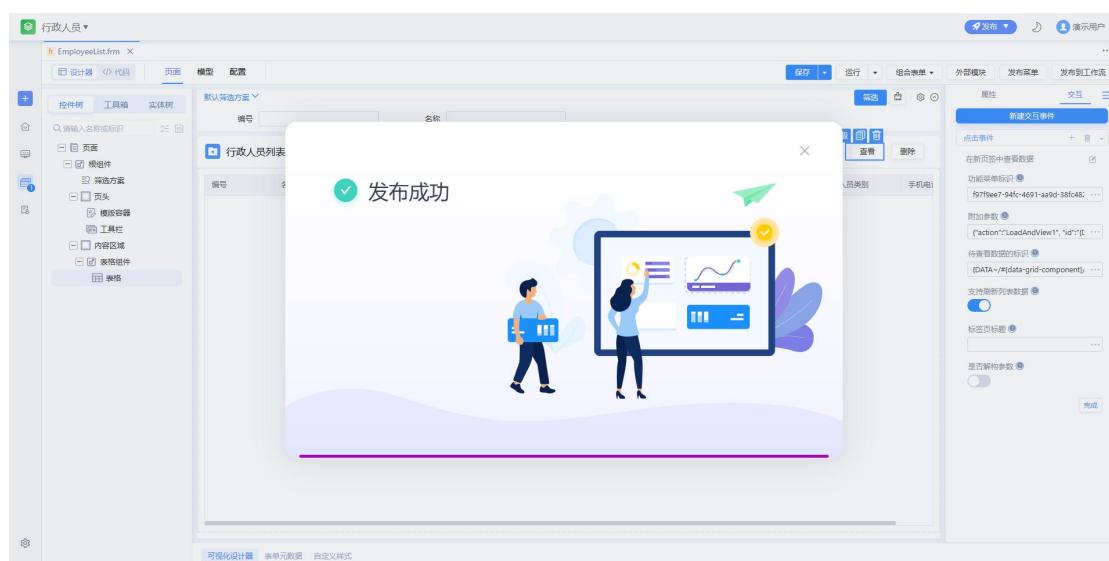


运行效果

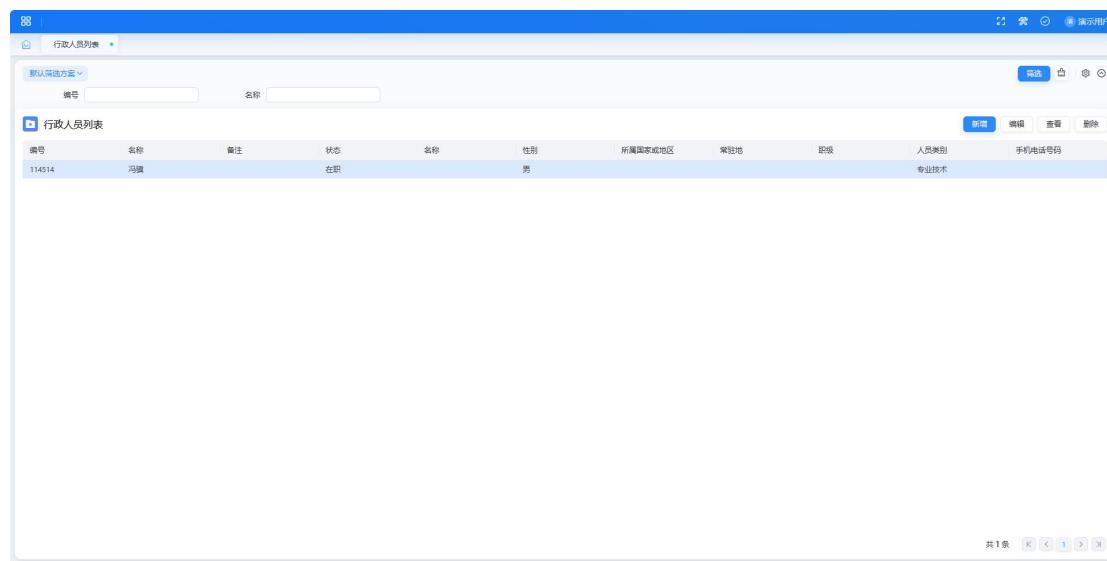


2.2.5 如何配置管理列表界面

列表界面发布

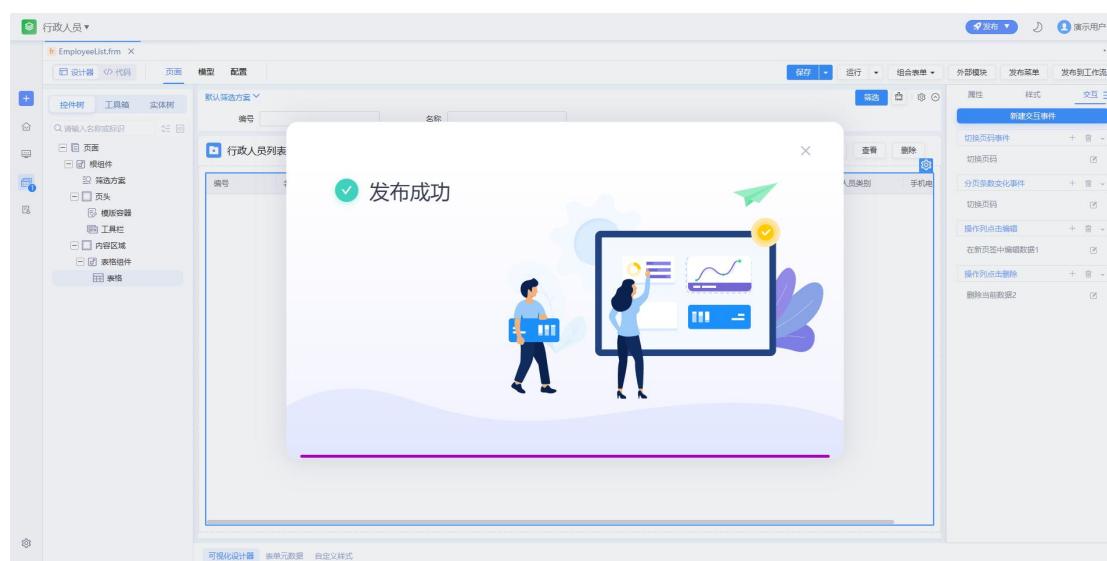


运行效果

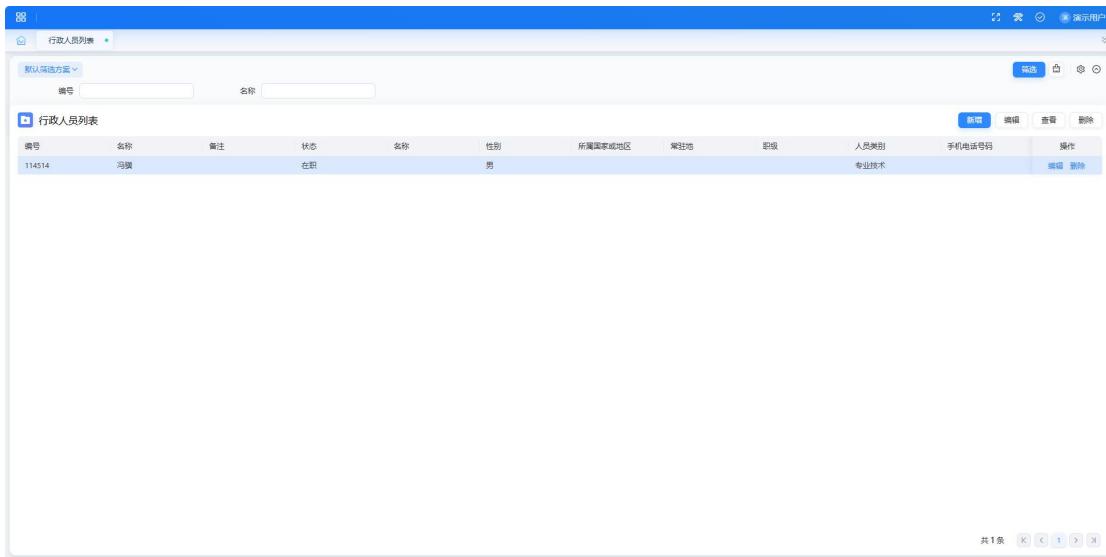


2.2.6 如何设置操作列

设置操作列后发布

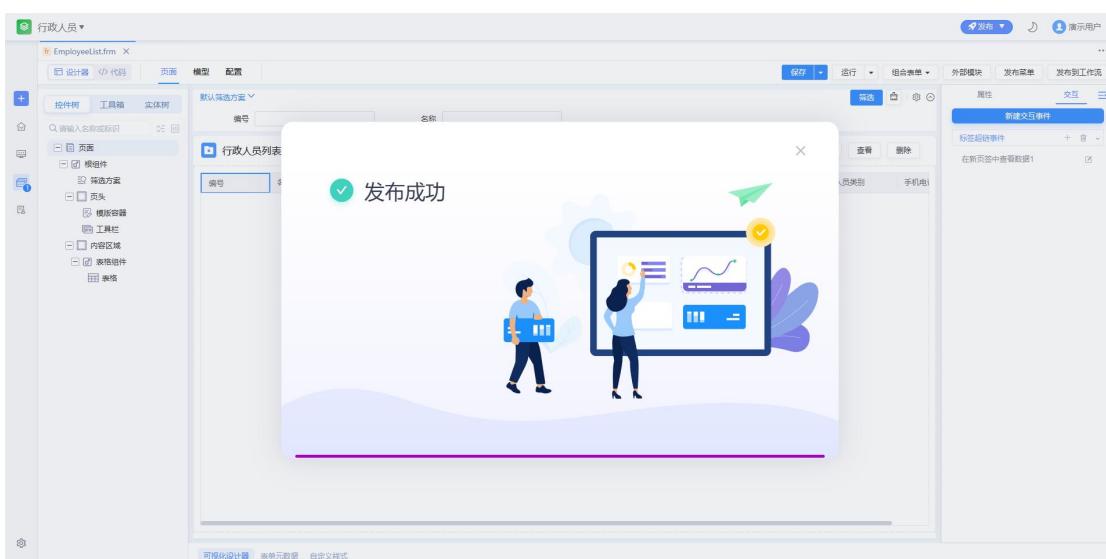


运行效果

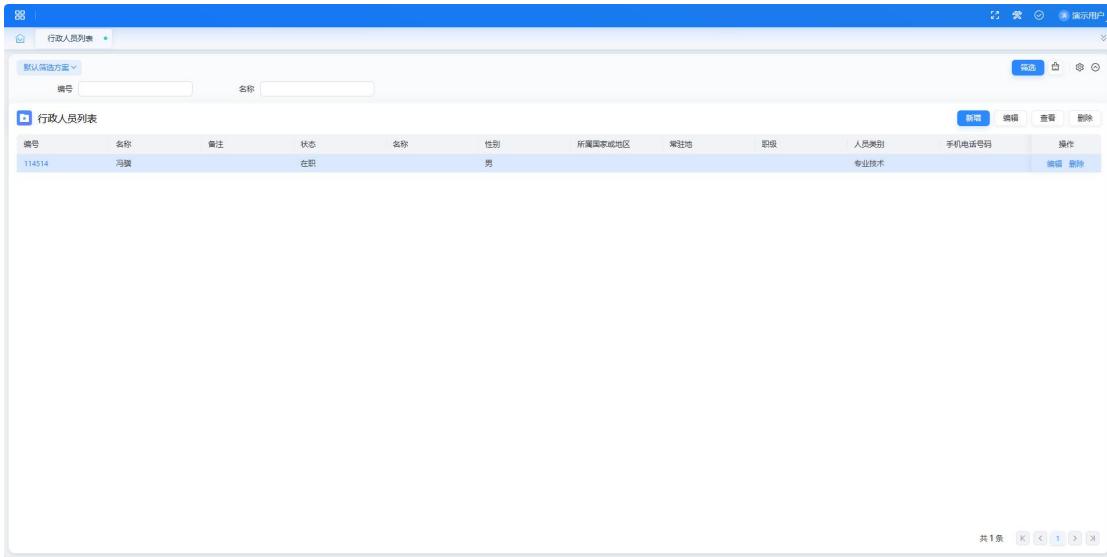


2.2.7 如何设置超链接

设置超链接后发布



运行效果

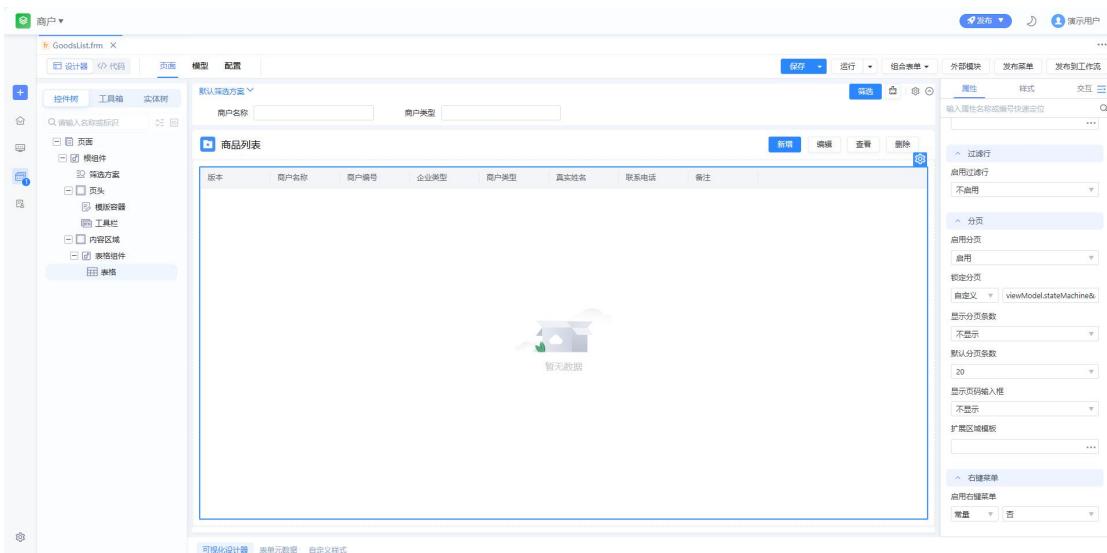


2.3 专题开发

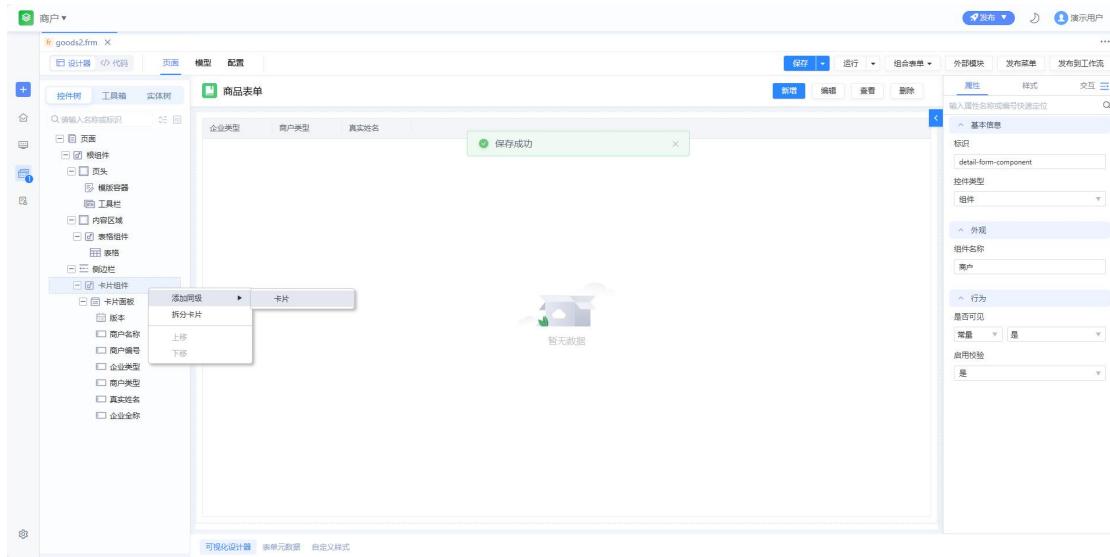
2.3.1 前端开发

一、前端模版介绍

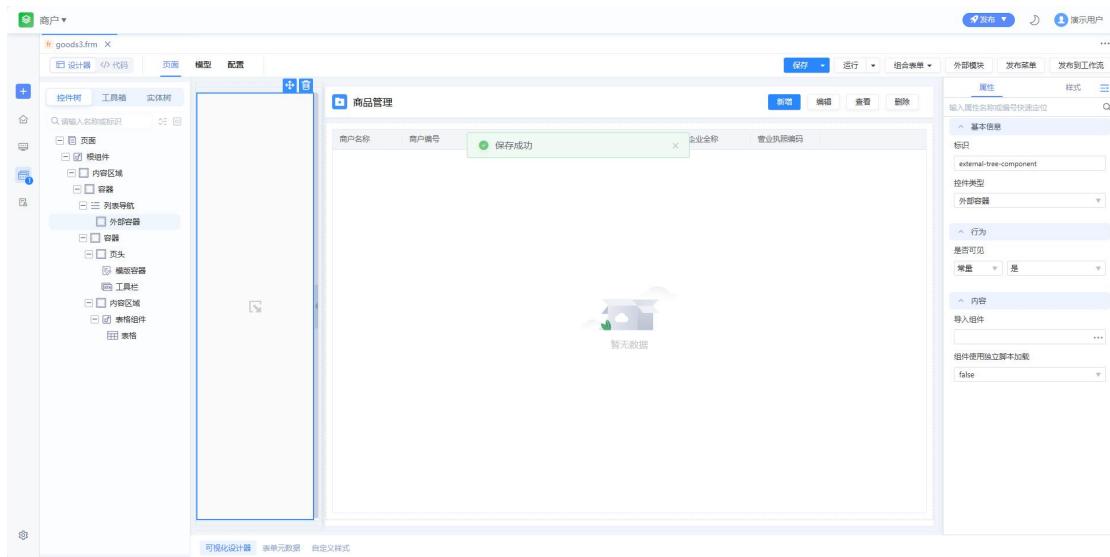
内置列表页面



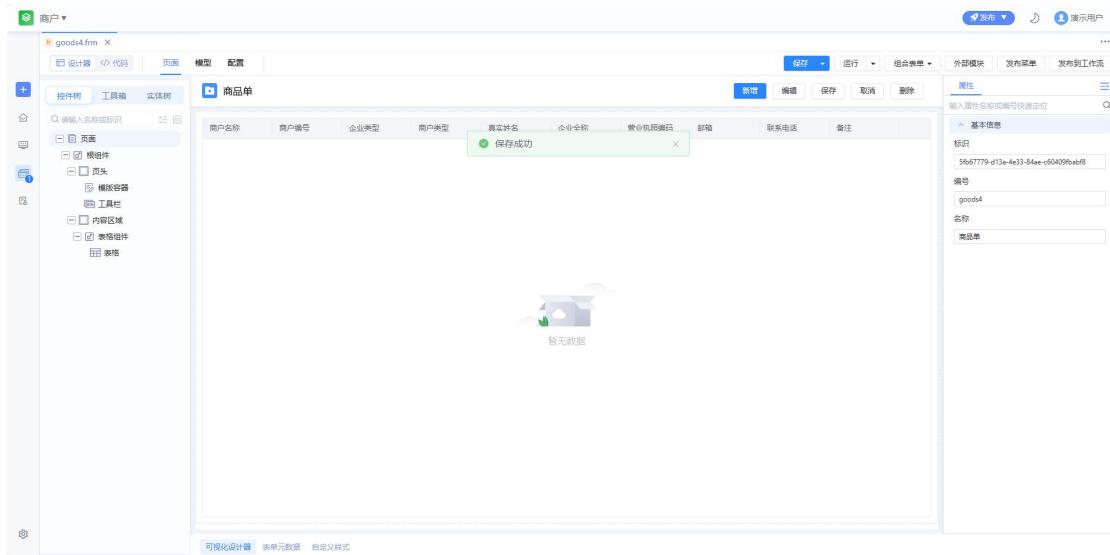
带侧边栏的列表界面



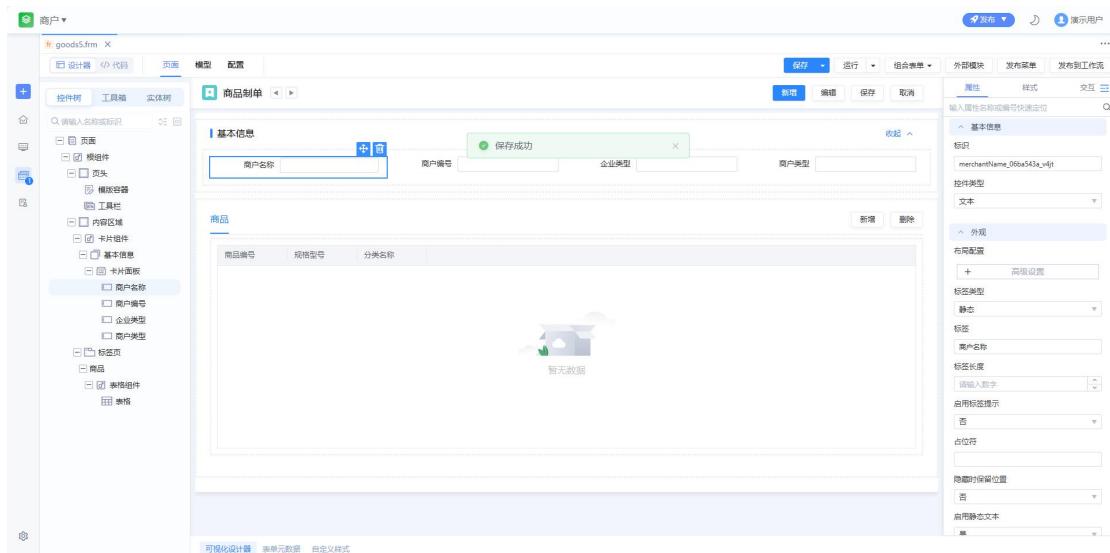
带导航的列表界面



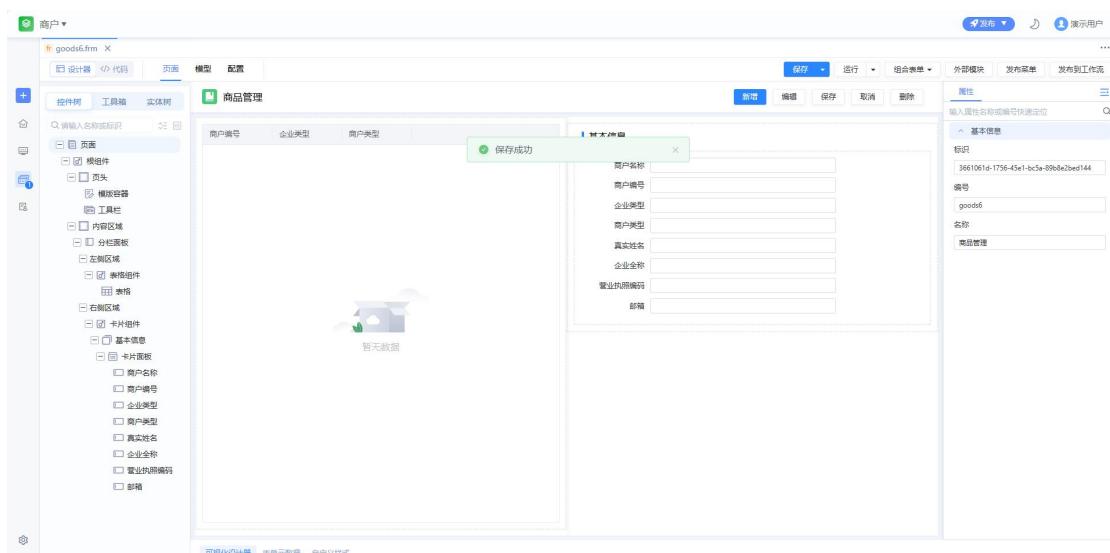
批量编辑的列表界面



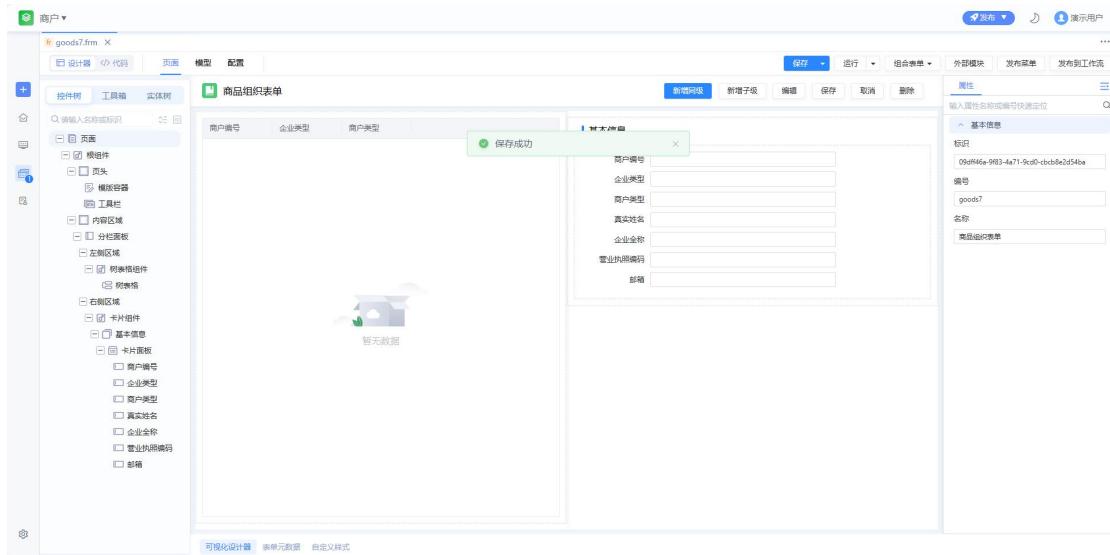
内置卡片界面



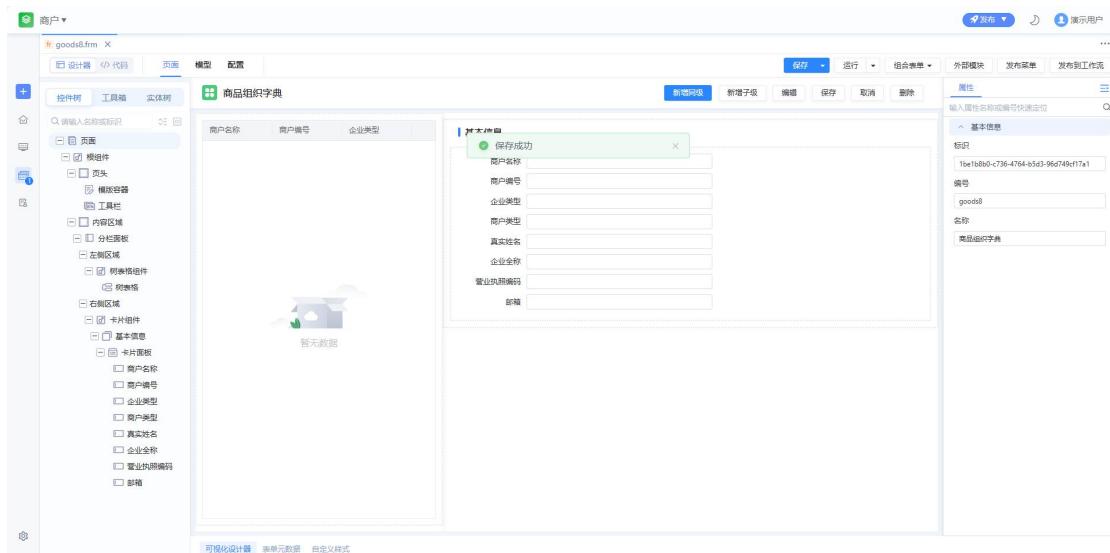
内置列表卡片界面



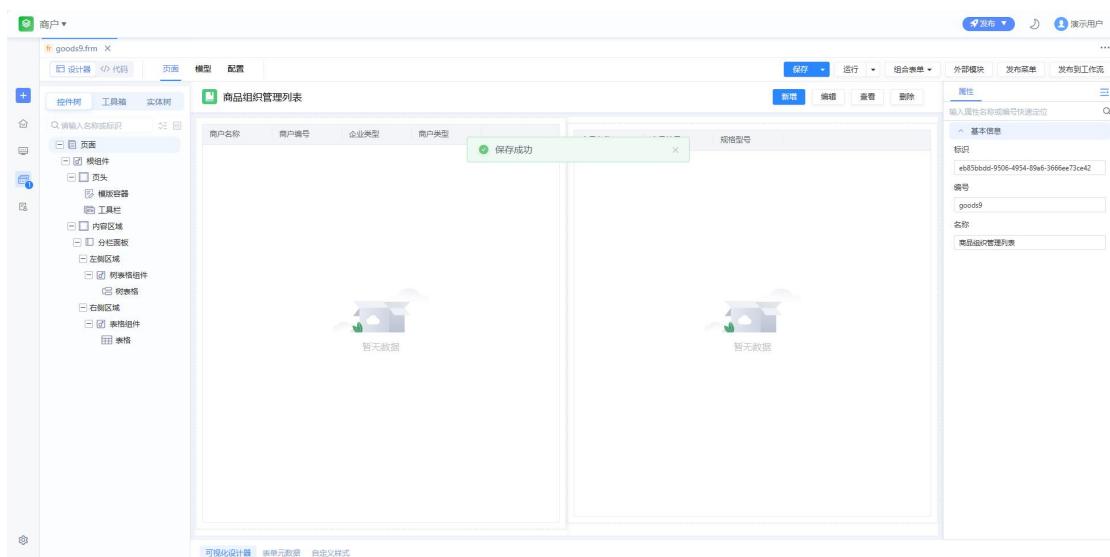
内置树卡界面



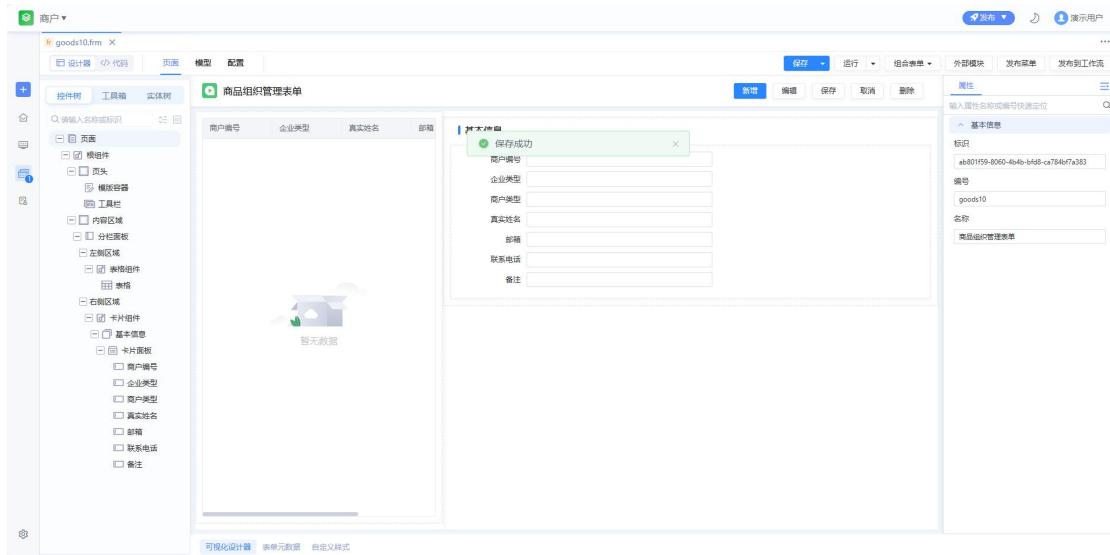
内置树字典界面



左树右列表界面

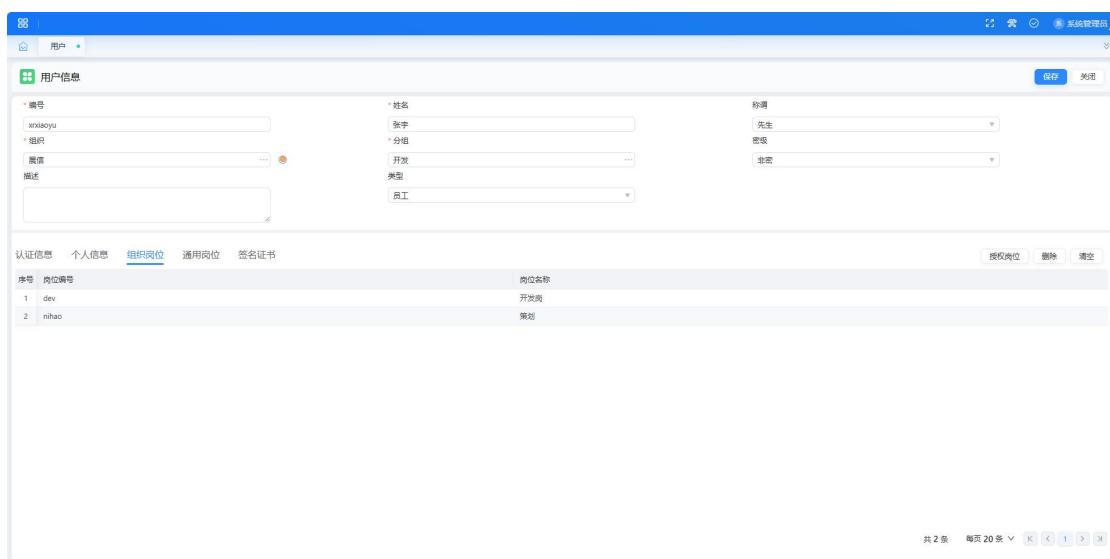


多数据源列卡界面

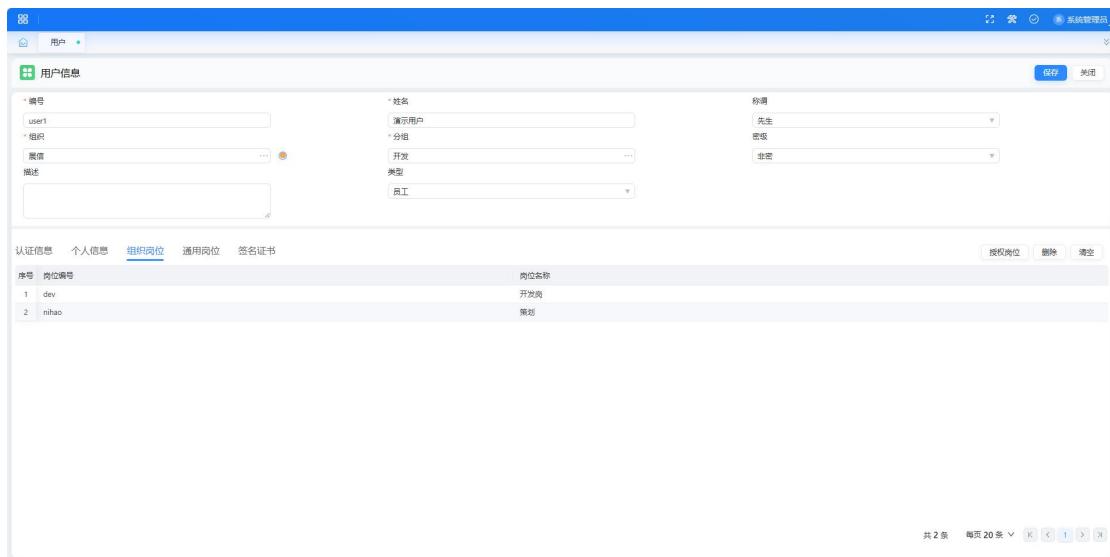


2.3.3 系统管理

新增管理员

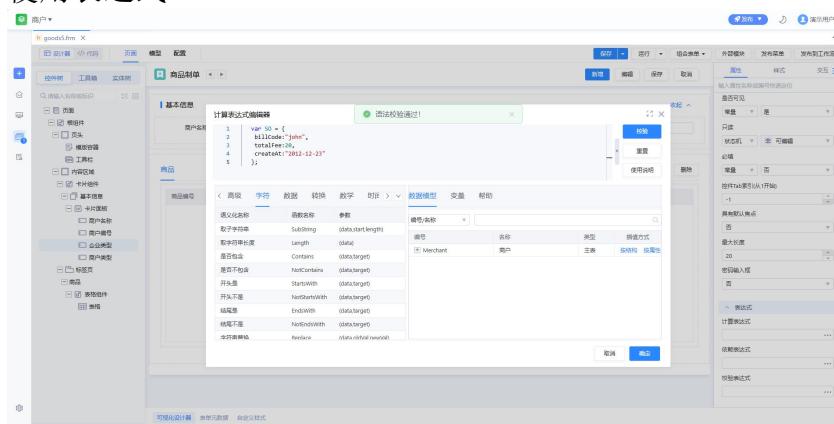


新增用户



2.3.4 系统管理

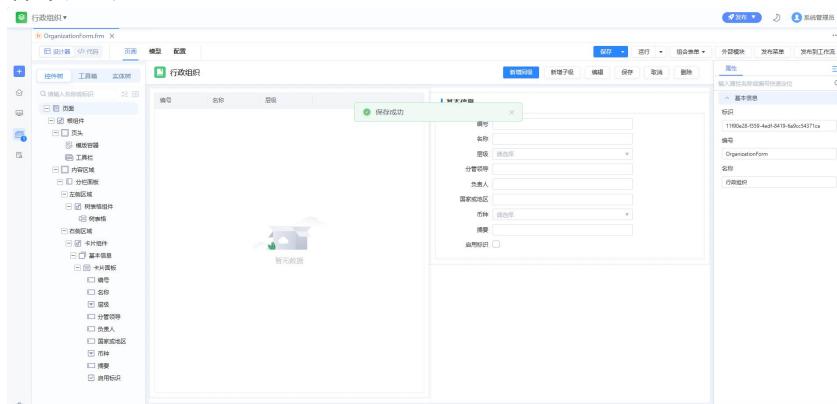
使用表达式



2.4 HandsOnLab

2.4.2 开发过程

行政组织



OrganizationForm.frm

模型 配置

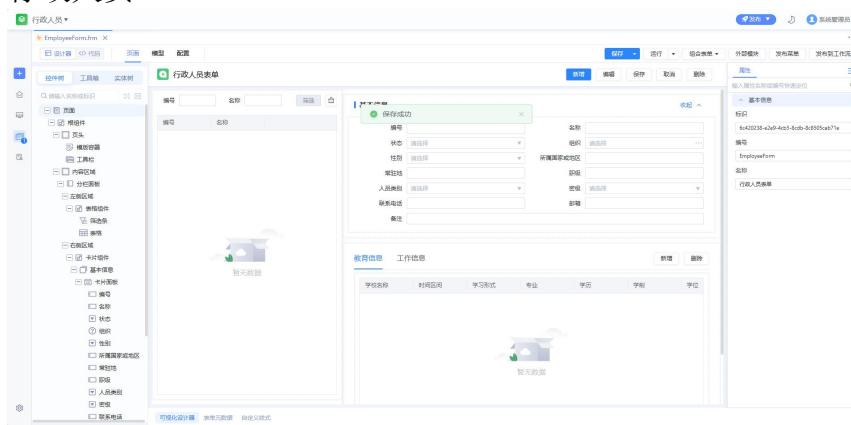
基础信息

保存成功

编号
名称
状态
负责人
所属地区
类型
摘要

基础
配置

行政人员



EmployeeForm.frm

模型 配置

基础信息

保存成功

编号
名称
状态
性别
岗位
所属地区
人员类别
联系方式
备注

基础
配置

3 利用 inBuilder 开发软件

3.1 场景描述和功能设计

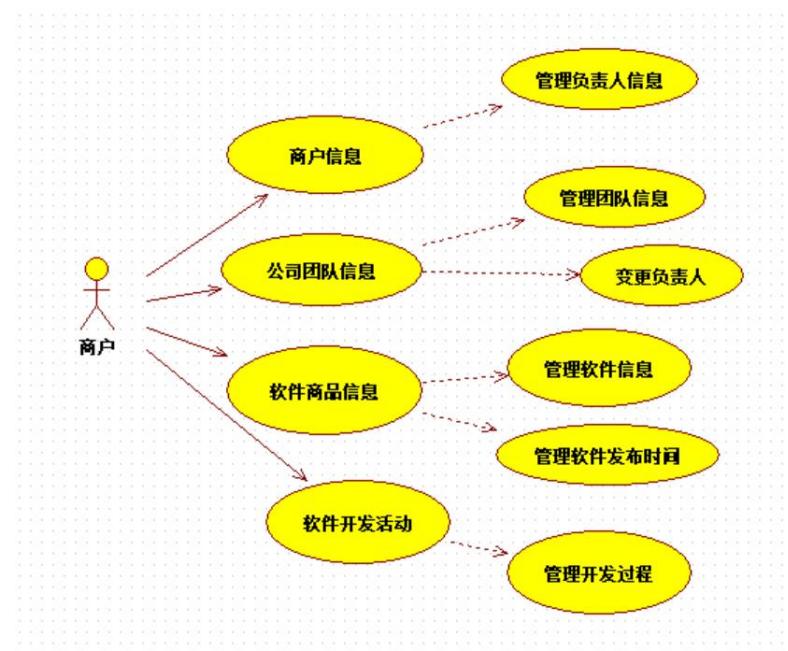


图 1 用例图示例

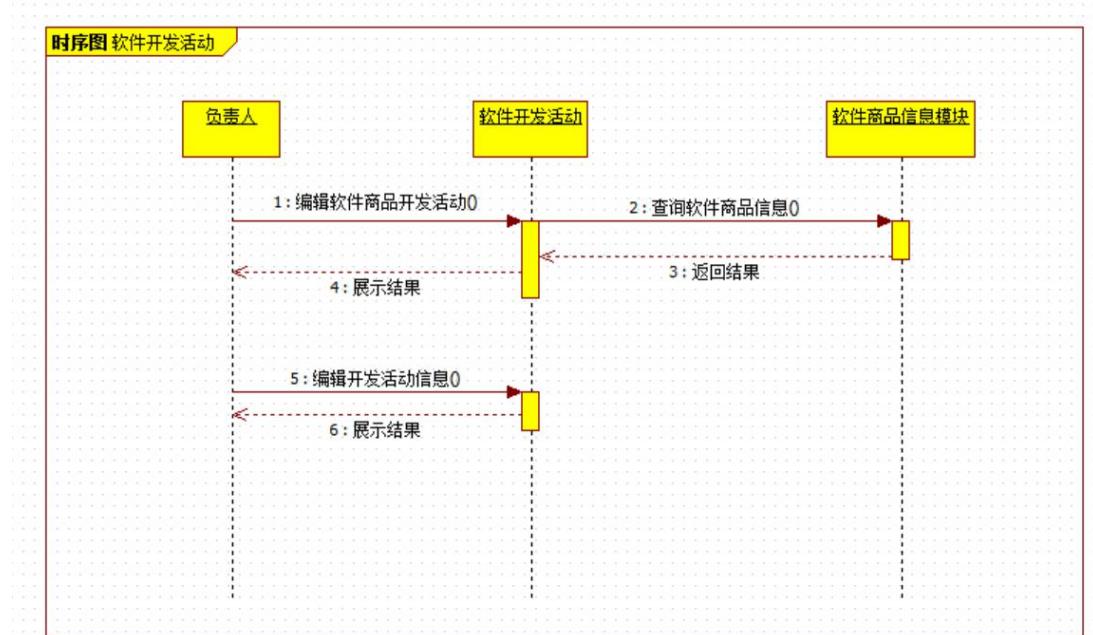


图 2 活动图示例

3.2 界面截图

商户名称：用于创建/编辑公司负责人信息

This screenshot shows a low-code platform interface for managing merchant information. The top navigation bar includes links for '商品总览', '公司总览', '商户总览', and '商户名称'. The current view is '商户名称'. The main area has tabs for '基本信息' (Basic Information) and '高级设置' (Advanced Settings). On the left, there are input fields for '商户姓名' (Merchant Name), '年龄' (Age), and '邮箱' (Email). On the right, there are fields for '性别' (Gender), '联系方式' (Contact Method), and '户籍' (Hukou). A large central text area is present. At the bottom right are buttons for '新增' (Add), '编辑' (Edit), '保存' (Save), and '取消' (Cancel).

商户总览：用于查看公司负责人信息

This screenshot shows a list of merchant information. The top navigation bar includes links for '商品总览', '公司总览', '商户总览', and '商户名称'. The current view is '商户总览'. The main area features a search bar with '姓名' (Name) and '电话' (Phone) fields, and a '筛选' (Filter) button. Below is a table titled '商户总览' (Merchant Overview) with columns: 姓名 (Name), 性别 (Gender), 年龄 (Age), 电话 (Phone), 邮箱 (Email), and 操作 (Operations). The table contains three entries:

姓名	性别	年龄	电话	邮箱	操作
扎西拉姆	男	20	15009886706	donniezfr@foxmail.com	编辑 删除
周姐	女	20	15786479753	zhouzhou@qq.com	编辑 删除
章鱼哥	男	20	18847086858	1397746428@qq.com	编辑 删除

At the bottom right, there is a page navigation bar showing '共 3 条' (3 items) and arrows for navigating through the pages.

公司名称

This screenshot shows a low-code platform interface for managing company information. The top navigation bar includes links for '商品总览', '公司总览', '商户总览', '商户名称', and '公司名称'. The current view is '公司名称'. The main area has tabs for '基本信息' (Basic Information) and '高级设置' (Advanced Settings). On the left, there are input fields for '名称' (Name), '控股人' (Controlling Shareholder), and '营业状态' (Business Status). On the right, there are fields for '注册地址' (Registration Address) and '人数规模' (Number of Employees). A large central text area is present. At the bottom right are buttons for '新增' (Add), '编辑' (Edit), '保存' (Save), and '取消' (Cancel).

公司总览

This screenshot shows the 'Company Overview' section of a low-code platform. The interface includes a header with navigation links like '商品总览', '公司总览', '商户总览', '商户名称', and '公司名称'. Below the header is a search bar and a toolbar with buttons for '筛选', '新增', '编辑', '查看', and '删除'. A table displays company information with columns: '公司名称', '注册地址', '控股人', '是否上市', and '人员规模'. Two entries are listed: 'IECS实验室' and 'RunWe实验室'.

公司名称	注册地址	控股人	是否上市	人员规模
IECS实验室	山东省威海市哈工大威海研究院1号楼中413	周姐	未上市	0~50人
RunWe实验室	山东省威海市哈工大威海研究院1号楼中501	扎西拉姆	上市	50~100人

共 2 条

商品名称

This screenshot shows the 'Product Name' creation page. The header has a '商品名称' tab selected. The main area contains a form with sections for '基本信息' (Basic Information) and '商品名称' (Product Name). Fields include '商品名称' (Product Name), '所属公司' (Company), '发布时间' (Release Date), '运行平台' (Running Platform), and '报价' (Quotation).

商品总览

This screenshot shows the 'Product Overview' section. The interface is similar to the company overview, with a header and a table displaying product information. The table columns are: '商品名称', '运行平台', '所属公司', '报价', and '发布时间'. Three products are listed: '智慧养老', '电梯维保', and '跨境电商CRM'.

商品名称	运行平台	所属公司	报价	发布时间
智慧养老	iOS、Harmony、Android	IECS实验室	3,000.00	2023年09月
电梯维保	Windows、Android	RunWe实验室	20,000.00	2024年05月
跨境电商CRM	Windows	RunWe实验室	20,000.00	2023年05月

共 3 条

商品活动

The screenshot shows a software application window titled '商品活动' (Product Activity). At the top, there is a navigation bar with links for '商品总览' (Product Overview), '公司总览' (Company Overview), '商户总览' (Merchant Overview), '商户名称' (Merchant Name), '公司名称' (Company Name), and '商品名称' (Product Name). A date '2022-12-05' is also displayed. Below the navigation bar, there is a toolbar with buttons for '新增' (Add), '编辑' (Edit), '查看' (View), and '删除' (Delete). The main content area displays a table with one row of data:

商品名称	开发状态	目前开发人数	(预计)完成时间
跨境电商CRM	开发已完成	24	2023年01月

At the bottom right of the main content area, there is a pagination indicator showing '共 1 条' (1 item total) and navigation arrows.

3.3 Demo 视频

视频地址：【基于 inbuilder 低代码平台的商品管理系统】
https://www.bilibili.com/video/BV1nCScYTEqj?vd_source=59d8aa94b6cc11ee7a65b62d079b9b2a

4 小结

在进行基于低代码平台的软件开发实验时，我通过简单的拖放组件和基本配置，成功构建了一个小型应用程序。实验过程中，我发现低代码平台的用户界面直观易懂，即使是不具备深厚编程技能的用户也能快速上手并实现应用程序的基本功能。然而，我也注意到，对于更定制化的需求，低代码平台提供的支持有限。这次实验让我深刻理解到，在追求开发效率的同时，低代码开发也需要兼顾灵活性和扩展性，以满足更多样化的业务需求。