HCMUTE

LẬP TRÌNH WEB

CRUD - Servlet JDBC

Khoa Công nghệ Thông tin
Đại học Sư phạm Kỹ thuật TP.HCM

ThS. Nguyễn Hữu Trung

Ví dụ: CRUD cho Category Table

- Bước 1: Tạo Database: ServletCRUDMVC, Tạo cấu trúc bảng

```
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE Category(
[cate_id] [int] IDENTITY(1,1) NOT NULL,
[cate_name] [nvarchar](255) NOT NULL,
[icons] [nvarchar](255) NULL,
PRIMARY KEY CLUSTERED
(
[cate_id] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF,
IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS =
ON) ON [PRIMARY]
) ON [PRIMARY]
GO
```

Ví dụ: CRUD cho Category Table

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<!-- Servlet -->
<dependency>
<groupId>javax.servlet</groupId>
<artifactId>javax.servlet-api</artifactId>
<version>3.1.0</version>
<scope>provided</scope>
</dependency>
<dependency>
<groupId>javax.servlet.jsp</groupId>
<artifactId>javax.servlet.jsp-api</artifactId>
<version>2.3.1</version>
<scope>provided</scope>
</dependency>
<dependency>
<groupId>jstl</groupId>
<artifactId>jstl</artifactId>
<version>1.2</version>
</dependency>
```

Ví dụ: CRUD cho Category Table

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<!-- Thư viện MySQL JDBC driver -->
<dependency>
   <groupId>mysql</groupId>
   <artifactId>mysql-connector-java</artifactId>
   <version>8.0.13</version>
</dependency>
<!-- Thư viện SQL server JDBC driver -->
<dependency>
<groupId>com.microsoft.sqlserver</groupId>
<artifactId>mssql-jdbc</artifactId>
<version>9.4.0.jre8</version>
</dependency>
```

```
<dependency>
<groupId>commons-fileupload</groupId>
<artifactId>commons-fileupload</artifactId>
<version>1.4</version>
</dependency>
```

Ví dụ: CRUD cho Category Table

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<build>
<plugins>
<plugin>
<artifactId>maven-war-plugin</artifactId>
<version>3.3.2</version>
</plugin>
<plugin>
<groupId>org.apache.maven.plugins</groupId>
<artifactId>maven-compiler-plugin</artifactId>
<version>3.8.1</version>
<configuration>
<source>1.8</source>
<target>1.8</target>
</configuration>
</plugin>
</plugins>
</build>
```

Ví dụ: CRUD cho Category Table

- Bước 3: Cấu hình web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app version="3.0" xmlns="http://JAVA.sun.com/xml/ns/javaee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd">
<display-name>Shopping Servlet Service MVC</display-name>
  <welcome-file-list>
    <welcome-file>index.jsp</welcome-file>
  </welcome-file-list>
<session-config>
<tracking-mode>COOKIE</tracking-mode>
</session-config>
</web-app>
```

Ví dụ: CRUD cho Category Table

- Bước 4: Cấu hình Datasource

```
public class DBConnection {
public Connection getConnection()throws Exception {
        String url = "jdbc:sqlserver://"+serverName+":"+portNumber + "\\"
+ instance +";databaseName="+dbName;
        if(instance == null || instance.trim().isEmpty())
            url = "jdbc:sqlserver://"+serverName+":"+portNumber
+";databaseName="+dbName;
        Class.forName("com.microsoft.sqlserver.jdbc.SQLServerDriver");
        return DriverManager.getConnection(url, userID, password);
    }
    private final String serverName = "localhost";
    private final String dbName = "ShoppingServiceMVC";
    private final String portNumber = "1433";
    private final String instance="";//MSSQLSERVER LEAVE THIS ONE EMPTY IF
YOUR SQL IS A SINGLE INSTANCE
    private final String userID = "sa";
    private final String password = "1234@a$";

}
```

Ví dụ: CRUD cho Category Table

- Bước 5: Tạo Class Model: Category.java

```
package vn.iotstar.model;

public class Category {

private int cateid;
private String catename;
private String icon;

//Tạo constructor, getters/setters
}
```

Ví dụ: CRUD cho Category Table

- Bước 6: Tạo Interface DAO: CategoryDAO.java

```
package vn.iotstar.dao;
import java.util.List;
import vn.iotstar.model.Category;
public interface CategoryDao {
       void insert(Category category);
       void edit(Category category);
       void delete(int id);
       Category get(int id);
       Category get(String name);
       List<Category> getAll();
       List<Category> search(String keyword);

}
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
package vn.iotstar.dao.impl;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.ArrayList;
import java.util.List;


import vn.iotstar.dao.CategoryDao;
import vn.iotstar.connection.DBConnection;
import vn.iotstar.model.Category;

public class CategoryDaoImpl extends DBConnection implements 
CategoryDao {
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
@Override
public void insert(Category category) {
String sql = "INSERT INTO category(cate_name,icons) VALUES (?,?)";

try {
Connection con = super.getConnection();
PreparedStatement ps = con.prepareStatement(sql);
ps.setString(1, category.getName());
ps.setString(2, category.getIcon());
ps.executeUpdate();
} catch (Exception e) {
e.printStackTrace();
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
@Override
public void edit(Category category) {
String sql = "UPDATE category SET cate_name = ?, icons=? WHERE
cate_id = ?";

try {
Connection con = super.getConnection();
PreparedStatement ps = con.prepareStatement(sql);
ps.setString(1, category.getName());
ps.setString(2, category.getIcon());
ps.setInt(3, category.getId());
ps.executeUpdate();
} catch (Exception e) {
// TODO Auto-generated catch block
e.printStackTrace();
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
@Override
public void delete(int id) {
String sql = "DELETE FROM category WHERE cate_id = ?";

try {
Connection con = super.getConnection();

PreparedStatement ps = con.prepareStatement(sql);
ps.setInt(1, id);
ps.executeUpdate();
} catch (Exception e) {
e.printStackTrace();
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
@Override
public Category get(int id) {
String sql = "SELECT * FROM category WHERE cate_id = ? ";
try {
Connection con = super.getConnection();
PreparedStatement ps = con.prepareStatement(sql);
ps.setInt(1, id);
ResultSet rs = ps.executeQuery();
while (rs.next()) {
Category category = new Category();
category.setId(rs.getInt("cate_id"));
category.setName(rs.getString("cate_name"));
category.setIcon(rs.getString("icons"));
return category;
}} catch (Exception e) {
e.printStackTrace();}
return null;
}
```

Ví dụ: CRUD cho Category Table

- Bước 7: Tạo Calss DAOImpl: CategoryDAOImpl.java

```
@Override
public List<Category> getAll() {
List<Category> categories = new ArrayList<Category>();
String sql = "SELECT * FROM Category";
try {
Connection conn = super.getConnection();
PreparedStatement ps = conn.prepareStatement(sql);
ResultSet rs = ps.executeQuery();
while (rs.next()) {
Category category = new Category();
category.setId(rs.getInt("cate_id"));
category.setName(rs.getString("cate_name"));
category.setIcon(rs.getString("icons"));
categories.add(category);
}} catch (Exception e) {
e.printStackTrace();}
return categories;
}
```

Ví dụ: CRUD cho Category Table

- Bước 8: Tạo interface Service: CategoryService.java

```
package vn.iotstar.service;
import java.util.List;
import vn.iotstar.model.Category;
public interface CategoryService {
    void insert(Category category);
    void edit(Category category);
    void delete(int id);
    Category get(int id);
    Category get(String name);
    List<Category> getAll();
    List<Category> search(String keyword);
}
```

Ví dụ: CRUD cho Category Table

- ☐ Bước 8: Tạo classs Service: CategoryServiceImpl.java

```
package vn.iotstar.service.impl;
import java.util.List;
import vn.iotstar.dao.CategoryDao;
import vn.iotstar.dao.impl.CategoryDaoImpl;
import vn.iotstar.model.Category;
import vn.iotstar.service.CategoryService;
public class CategoryServiceImpl implements CategoryService {
CategoryDao categoryDao = new CategoryDaoImpl();
@Override
public void insert(Category category) {
categoryDao.insert(category);
}
@Override
public void edit(Category newCategory) {
Category oldCate = categoryDao.get(newCategory.getId());
oldCate.setName(newCategory.getName());
categoryDao.edit(oldCate);
}
```

Ví dụ: CRUD cho Category Table

- Bước 8: Tạo classs Service: CategoryServiceImpl.java

```
package vn.iotstar.service.impl;
import java.io.File;
import java.util.List;
import vn.iotstar.dao.CategoryDao;
import vn.iotstar.dao.impl.CategoryDaoImpl;
import vn.iotstar.model.Category;
import vn.iotstar.service.CategoryService;
public class CategoryServiceImpl implements CategoryService {
CategoryDao categoryDao = new CategoryDaoImpl();
@Override
public void insert(Category category) {
categoryDao.insert(category);
}
@Override
public void delete(int id) {
categoryDao.delete(id);
}
@Override
public Category get(int id) {
return categoryDao.get(id);
}
```

Ví dụ: CRUD cho Category Table

- ☐ Bước 8: Tạo classs Service: CategoryServiceImpl.java

```
@Override
public void edit(Category newCategory) {
Category oldCategory = categoryDao.get(newCategory.getId());
oldCategory.setName(newCategory.getName());
if (newCategory.getIcon() != null) {
// XOA ANH CU DI
String fileName = oldCategory.getIcon();
final String dir = "E:\\upload";
File file = new File(dir + "/category" + fileName);
if (file.exists()) {
file.delete();
}
oldCategory.setIcon(newCategory.getIcon());
}
categoryDao.edit(oldCategory);
}
```

Ví dụ: CRUD cho Category Table

- Bước 8: Tạo classs Service: CategoryServiceImpl.java

```java
@Override
public Category get(String name) {
return categoryDao.get(name);
}

@Override
public List<Category> getAll() {
return categoryDao.getAll();
}

@Override
public List<Category> search(String catename) {
return categoryDao.search(catename);
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryController.java

```
@WebServlet(urlPatterns = { "/admin/category/list" })
public class CategoryeListController extends HttpServlet {
CategoryService cateService = new CategoryServiceImpl();

@Override
protected void doGet(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
List<Category> cateList = cateService.getAll();
req.setAttribute("cateList", cateList);
RequestDispatcher dispatcher =
req.getRequestDispatcher("/views/admin/list-category.jsp");
dispatcher.forward(req, resp);
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryEditController.java

```
@WebServlet(urlPatterns = { "/admin/category/edit" })
public class CategoryeEditController extends HttpServlet {
CategoryService cateService = new CategoryServiceImpl();
@Override
protected void doGet(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
String id = req.getParameter("id");
Category category = cateService.get(Integer.parseInt(id));
req.setAttribute("category", category);
RequestDispatcher dispatcher =
req.getRequestDispatcher("/views/admin/edit-category.jsp");
dispatcher.forward(req, resp);
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryEditController.java

```
@Override
protected void doPost(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
Category category = new Category();
DiskFileItemFactory diskFileItemFactory = new
DiskFileItemFactory();
ServletFileUpload servletFileUpload = new
ServletFileUpload(diskFileItemFactory);
servletFileUpload.setHeaderEncoding("UTF-8");
try {
resp.setContentType("text/html");
resp.setCharacterEncoding("UTF-8");
req.setCharacterEncoding("UTF-8");
List<FileItem> items = servletFileUpload.parseRequest(req);
for (FileItem item : items) {
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryEditController.java

```
if (item.getFieldName().equals("id")) {
category.setId(Integer.parseInt(item.getString()));
} else if (item.getFieldName().equals("name")) {
category.setName(item.getString("UTF-8"));
} else if (item.getFieldName().equals("icon")) {
if (item.getSize() > 0) {// neu co file d
String originalFileName = item.getName();
int index = originalFileName.lastIndexOf(".");
String ext = originalFileName.substring(index + 1);
String fileName = System.currentTimeMillis() + "." + ext;
File file = new File(Constant.DIR + "/category/" + fileName);
item.write(file);
category.setIcon("category/"+fileName);
} else {
category.setIcon(null);}}}
cateService.edit(category);
resp.sendRedirect(req.getContextPath() + "/admin/category/list");
} catch (FileUploadException e) {
e.printStackTrace();
} catch (Exception e) {e.printStackTrace();}
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryAddController.java

```
@WebServlet(urlPatterns = { "/admin/category/add" })
public class CategoryAddController extends HttpServlet {
CategoryService cateService = new CategoryServiceImpl();
@Override
protected void doGet(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
RequestDispatcher dispatcher =
req.getRequestDispatcher("/views/admin/add-category.jsp");
dispatcher.forward(req, resp);
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryAddController.java

```
@Override
protected void doPost(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
Category category = new Category();
DiskFileItemFactory diskFileItemFactory = new
DiskFileItemFactory();
ServletFileUpload servletFileUpload = new
ServletFileUpload(diskFileItemFactory);
servletFileUpload.setHeaderEncoding("UTF-8");
try {
resp.setContentType("text/html");
resp.setCharacterEncoding("UTF-8");
req.setCharacterEncoding("UTF-8");
List<FileItem> items = servletFileUpload.parseRequest(req);
for (FileItem item : items) {
if (item.getFieldName().equals("name")) {
category.setName(item.getString("UTF-8"));
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryAddController.java

```
} else if (item.getFieldName().equals("icon")) {
String originalFileName = item.getName();
int index = originalFileName.lastIndexOf(".");
String ext = originalFileName.substring(index + 1);
String fileName = System.currentTimeMillis() + "." + ext;
File file = new File(Constant.DIR + "/category/" + fileName);
item.write(file);
category.setIcon("category/"+fileName);
}
}
cateService.insert(category);
resp.sendRedirect(req.getContextPath() + "/admin/category/list");
} catch (FileUploadException e) {
e.printStackTrace();
} catch (Exception e) {
e.printStackTrace();
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 9: Tạo Calss Controller: CategoryDeleteController.java

```
@WebServlet(urlPatterns = { "/admin/category/delete" })
public class CategoryeDeleteController extends HttpServlet {
CategoryService cateService = new CategoryServiceImpl();

@Override
protected void doGet(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
String id = req.getParameter("id");
cateService.delete(Integer.parseInt(id));
resp.sendRedirect(req.getContextPath() + "/admin/category/list");
}

}
```

Ví dụ: CRUD cho Category Table

- Bước 10: Chỉnh lại trang list-category.jsp

```
<c:forEach items="${cateList}" var="cate" varStatus="STT" >
<tr class="odd gradeX">
<td>${STT.index+1 }</td>
<c:url value="/image?fname=${cate.icon }" var="imgUrl"></c:url>
<td><img height="150" width="200" src="${imgUrl}" /></td>
<td>${cate.name }</td>
<td><a href="<c:url value='/admin/category/edit?id=${cate.id }'/>"
class="center">Sửa</a>
| <a href="<c:url value='/admin/category/delete?id=${cate.id }'/>"
class="center">Xóa</a></td>
</tr>
</c:forEach>
```

Ví dụ: CRUD cho Category Table

- Bước 10: Chỉnh lại trang add-category.jsp

```
<form role="form" action="add" method="post"
enctype="multipart/form-data">
<div class="form-group">
<label>Tên danh mục:</label> <input class="form-control"
placeholder="please enter category Name" name="name" />
</div>

<div class="form-group">
<label>Ảnh đại diện</label> <input type="file" name="icon" />
</div>
<button type="submit" class="btn btn-default">Thêm</button>
<button type="reset" class="btn btn-primary">Hủy</button>
</form>
```

Ví dụ: CRUD cho Category Table

- Bước 11: Chỉnh lại trang edit-Category.jsp

```
<c:url value="/admin/category/edit" var="edit"></c:url>
<form role="form" action="${edit}" method="post"
enctype="multipart/form-data">
<input name="id" value="${category.id }" hidden="">
<div class="form-group">
<label>Tên danh sách:</label> <input type="text" class="form-control"
value="${category.name }" name="name" />
</div>
<div class="form-group">
<c:url value="/image?fname=${category.icon }" var="imgUrl"></c:url>
<img class="img-responsive" width="100px" src="${imgUrl}"
alt="">
<label>Ảnh đại diện</label> <input type="file" name="icon"
value="${category.icon }" />
</div>
<button type="submit" class="btn btn-default">Edit</button>
<button type="reset" class="btn btn-primary">Reset</button>
</form>
```

Class constant: khai báo các hằng số

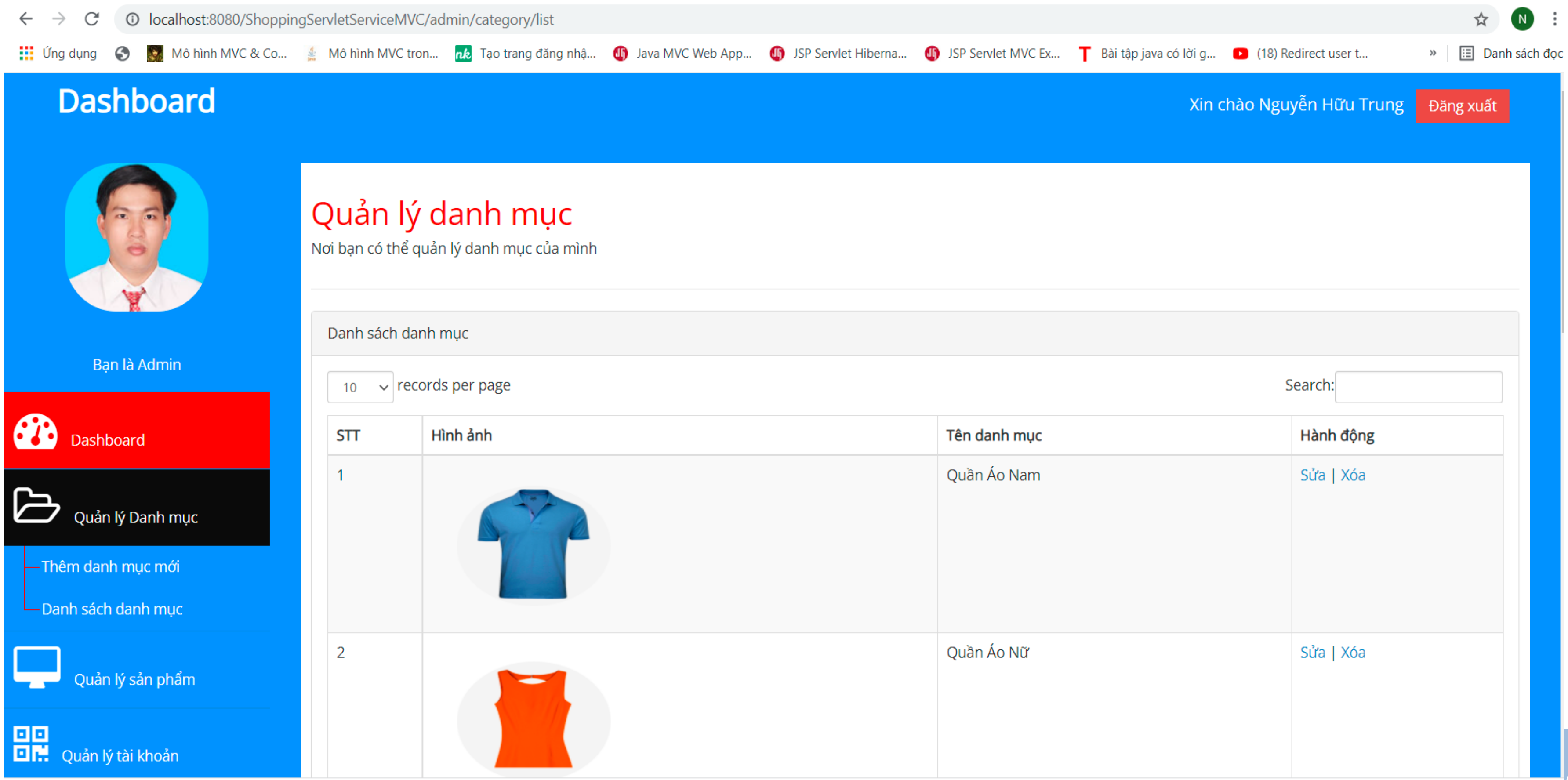
```java
package vn.iotstar.util;

public class Constant {
public static final String DIR = "E:\\upload";

}

}
```

Download file

```
@SuppressWarnings("serial")
@WebServlet(urlPatterns = "/image") // ?fname=abc.png
public class DownloadImageController extends HttpServlet {

@Override
protected void doGet(HttpServletRequest req, HttpServletResponse
resp) throws ServletException, IOException {
String fileName = req.getParameter("fname");
File file = new File(Constant.DIR + "/" + fileName);

resp.setContentType("image/jpeg");

if (file.exists()) {
IOUtils.copy(new FileInputStream(file), resp.getOutputStream());
}
}
}
```

Ví dụ: CRUD cho Category Table

- Bước 12: Kết quả


localhost:8080/ShoppingServletServiceMVC/admin/category/list
Ứng dụng
Mô hình MVC & Co...
Mô hình MVC tron...
Tạo trang đăng nhậ...
Java MVC Web App...
JSP Servlet Hiberna...
JSP Servlet MVC Ex...
Bài tập java có lời g...
(18) Redirect user t...
Danh sách đọc
Dashboard
Xin chào Nguyễn Hữu Trung
Đăng xuất
Bạn là Admin
Dashboard
Quản lý Danh mục
Thêm danh mục mới
Danh sách danh mục
Quản lý sản phẩm
Quản lý tài khoản

Quản lý danh mục

Nơi bạn có thể quản lý danh mục của mình

Danh sách danh mục

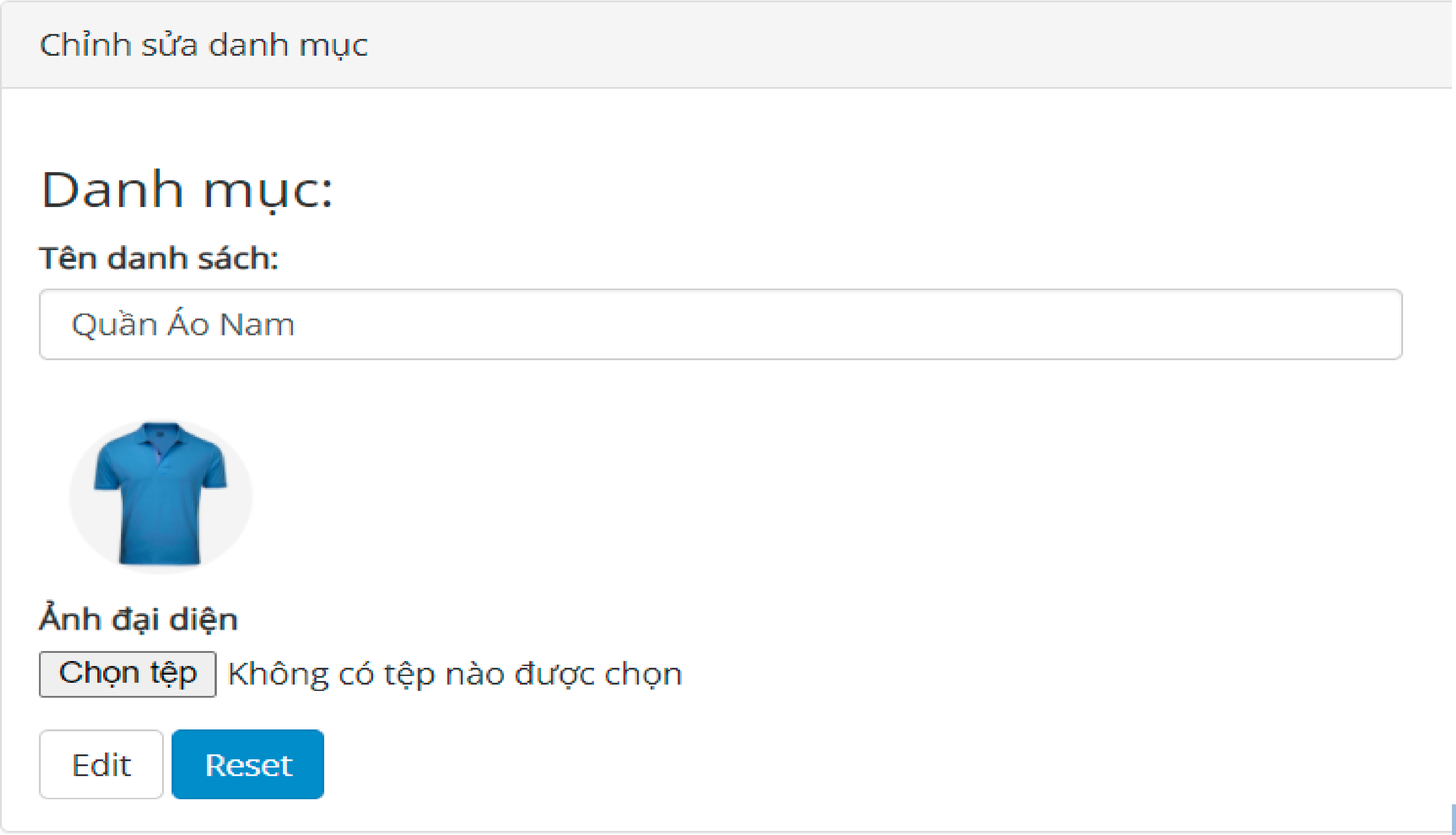
10 records per page

Search:

STT	Hình ảnh	Tên danh mục	Hành động
1		Quần Áo Nam	Sửa | Xóa
2		Quần Áo Nữ	Sửa | Xóa

Ví dụ: CRUD cho Category Table

- Bước 12: Kết quả



Chỉnh sửa danh mục

Danh mục:

Tên danh sách:

Quần Áo Nam

Ảnh đại diện

Chọn tệp
Không có tệp nào được chọn
Edit
Reset

Thông tin liên lạc

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