



CAPSTONE PROJECT REPORT

Report 6 – Software User Guides

– Ho Chi Minh City, December 2025–

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I. Project Report

1. Status Report

#	Work Item	Status	Notes (Work Item in Details)
1	Delivery packages	Completed	
2	Installation Guides	Completed	
3	User Manual	Completed	

2. Team Involvements

#	Task	Member	Notes (Task Details, etc.)
1	User Manual	NhatDM	
2	Installation Guides	KhoiPD	
3	Delivery packages	DucDT	

II. Release Package & User Guides

1. Deliverable Package

1.1 Source codes & documents

No.	Items	Sub-Items	Type	Version
Code Package				
1	LSSCTC Backend API	Web Service	Modify	10.5
2	LSSCTC Frontend Web App	User Web Application	Modify	9.3
3	LSSCTC Simulator Desktop App	User Desktop Application	Modify	3.0
Database				
1	Tables	lssctc_db_script.sql	Modify	N/A
Documents				
1	Project Introduction	Report1_Project Introduction.docx	Modify	1.0
2	Project Management Plan	Report2_Project Management Plan.docx	Modify	1.0
3	Software Requirement Specification	Report3_Software Requirement Specification.docx	Modify	1.0
4	Software Design Document	Report4_Software Design Document.docx	Modify	1.0
5	Test Documentation	Report5_Test Documentation.docx	Modify	1.0
6	Software User Guides	Report6_Software User Guides.docx	Modify	1.0
7	Final Project	Report7_FinalProjectReport.docx	Modify	1.0

No.	Items	Sub-Items	Type	Version
	Report			

1.2 Known Issues, Limitations & Restrictions

- npm install fails: Delete the node_modules folder and package-lock.json file, then run npm install again.
- Port 5173 already in use: Stop the process currently using the port or change the port number in the vite.config.js file.
- API calls fail with CORS error: Verify that the backend server is running and configured to accept requests from http://localhost:5173.
- Google OAuth not working: Ensure the Client ID in the .env file is correct and the Redirect URIs in the Google Cloud Console match your local URL.
- Blank page appears after loading: Open the browser developer tools console to check for JavaScript errors or missing environment variables.
- Module not found errors: Run npm install again to ensure all required dependencies are downloaded.

2. Installation Guides

2.1 System Requirements

2.1.1 Hardware Requirements

Component	Minimum	Recommended
CPU	At least 2 GHz x64-bit CPU	Intel Core I5, 4GHz
Memory	At least 8GB RAM	16GB RAM
Storage	10GB SSD	15GB SSD
Network	Internet Connection	500 Mbps

Table 1: Hardware Requirements

2.1.2 Software Requirements

Component	Software & Version	Description
Operating System	Windows 10/11, macOS 10.15+, or Linux (Ubuntu 20.04+)	Operating system for running project
DBMS	SQL Server 2019 or Azure SQL Database	Database management system
Server Environment	.NET 8.0 SDK	Environment for running backend API
Frontend Environment	Node.js 18.17.0 or higher	Environment for running frontend application
Package Manager	NPM 9.x or higher	Package manager for frontend dependencies
IDE	Visual Studio Code 1.80+ or Visual Studio 2022	Tool for viewing and editing code

VCS	Git 2.30+	Tool for managing code version
Web Browser	Chrome 90+, Firefox 88+, Edge 90+, or Safari 14+	Browser for accessing web application
Database Tool	SQL Server Management Studio (SSMS) 19+ or Azure Data Studio	Tool for database management

Table 2: Software Requirements

2.2 Setup Files

2.2.1 Database Files

- **lssctc_db-script-v5.sql:** Complete database schema script for SQL Server
- **seed-data.sql:** Initial seed data for system (users, roles, course categories, etc.)

2.2.2 Backend Files

- **lssctc-api.zip:** Complete backend API solution
 - Contains: Controllers, Services, Models, Repositories, and Configuration files
 - Main project: Lssctc.ProgramManagement
 - Shared library: Lssctc.Share

2.2.3 Frontend Files

- **lssctc-web.zip:** Complete frontend web application
 - Contains: React components, Pages, Routes, Layouts, and Assets
 - Main entry: src/main.jsx
 - Configuration: vite.config.js, package.json

2.2.4 Configuration Files

- **appsettings.json:** Backend API configuration (connection strings, JWT settings)
- **appsettings.Development.json:** Development-specific settings
- **.env.example:** Frontend environment variables template

2.3 Installation Instruction

2.3.1 Setup Environment

Step 1: Install Required Software

- **Download and Install .NET 8.0 SDK**
 - Visit: <https://dotnet.microsoft.com/download/dotnet/8.0>
 - Download .NET 8.0 SDK for your operating system
 - Run installer and follow installation wizard
- **Download and Install Node.js 18.17.0 or higher**
 - Visit: <https://nodejs.org/>

- Download LTS version (18.17.0 or newer)
- Run installer and follow installation wizard

- **Download and Install SQL Server 2019**

- Visit: <https://www.microsoft.com/en-us/sql-server/sql-server-downloads>
- Download SQL Server 2019 Developer Edition (free)
- Run installer and select:
 - Database Engine Services
 - SQL Server Replication
 - Client Tools Connectivity
- Configure authentication mode: **Mixed Mode** (SQL Server and Windows Authentication)
- Set SA password (remember this for connection string)
- Verify installation using SQL Server Configuration Manager

- **Download and Install SQL Server Management Studio (SSMS)**

- Visit: <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms>
- Download latest version (19.x)
- Run installer
- Launch SSMS and connect to local SQL Server instance

- **Download and Install Visual Studio Code**

- Visit: <https://code.visualstudio.com/>
- Download for your operating system
- Install recommended extensions:
 - C# Dev Kit
 - C# Extensions
 - JavaScript (ES6) code snippets
 - ESLint
 - Prettier - Code formatter
 - Thunder Client (for API testing)

- **Download and Install Git**

- Visit: <https://git-scm.com/downloads>
- Download for your operating system

- Run installer with default options

Step 2: Configure Git

- Set your name and email
 - git config --global user.name "Your Name"
 - git config --global user.email "your.email@example.com"
- Verify configuration
 - git config --list

Step 3: Connect Git with GitHub Account

- Generate SSH key (if not already exists)
 - ssh-keygen -t ed25519 -C "your.email@example.com"
- Start SSH agent
 - eval "\$(ssh-agent -s)"
- Add SSH key to agent
 - ssh-add ~/.ssh/id_ed25519
- Copy public key to clipboard (Windows)
 - clip < ~/.ssh/id_ed25519.pub
- Copy public key to clipboard (macOS)
 - pbcopy < ~/.ssh/id_ed25519.pub
- Copy public key to clipboard (Linux)
 - cat ~/.ssh/id_ed25519.pub | xclip -selection clipboard
- Go to GitHub → Settings → SSH and GPG keys → New SSH key
- Paste your public key and save

Step 4: Clone Repositories

- Create project directory
 - mkdir lssctc-project
 - cd lssctc-project
- Clone backend repository
 - git clone https://github.com/hieuvau198/lssctc-api.git
- Clone frontend repository
 - git clone https://github.com/hieuvau198/lssctc-web.git

2.3.2 Setup Database

Step 1: Create Database

- Open **SQL Server Management Studio (SSMS)**
- Connect to your local SQL Server instance
- Right-click on **Databases** → Select **New Database**
- Database name: LSSCTC_DB
- Click **OK**

Step 2: Execute Database Script

- Open **lssctc_db-script-v5.sql** in SSMS
 - File → Open → File → Select lssctc_db-script.sql
- Ensure **LSSCTC_DB** is selected in database dropdown
- Click **Execute** button or press F5
- Wait for script execution to complete
- Verify tables are created:
- USE LSSCTC_DB;
- GO
- SELECT TABLE_SCHEMA, TABLE_NAME
- FROM INFORMATION_SCHEMA.TABLES
- WHERE TABLE_TYPE = 'BASE TABLE'
- ORDER BY TABLE_NAME;
- Expected output: 40+ tables including users, roles, courses, classes, quizzes, etc.

Step 3: Execute Seed Data (Optional)

- Open **seed-data.sql** in SSMS
- Execute script to populate initial data:
 - Default admin account
 - Course categories and levels
 - Course and class codes
 - Material types
- Verify seed data:
- SELECT * FROM users;

- SELECT * FROM course_categories;
- SELECT * FROM course_levels;

Step 4: Verify Database Connection String

- Server name: localhost or (local) or .
 - Database name: LSSCTC_DB
 - Authentication: SQL Server Authentication or Windows Authentication
 - Example connection string:
 - Server=localhost;Database=LSSCTC_DB;User Id=sa;Password=YourPassword;TrustServerCertificate=True
-

2.3.3 Setup and Run Backend API

Step 1: Navigate to Backend Project

- cd lssctc-project/lssctc-api/Lssctc/Lssctc.ProgramManagement

Step 2: Configure Application Settings

- Open **appsettings.json** in text editor or VS Code
- Update your custom value for: "ConnectionStrings", "JwtConfig", "EmailSettings"
- **Generate JWT Secret Key** (recommended):
 - Generate random 32-character key using PowerShell (Windows)
 - Generate random 32-character key using openssl (macOS/Linux)
- **Configure Email Settings** (for OTP functionality):
 - Use Gmail account
 - Enable 2-Factor Authentication
 - Generate App Password: <https://myaccount.google.com/apppasswords>
 - Use App Password in configuration (not your Gmail password)

Step 3: Restore NuGet Packages

- Restore all dependencies
 - dotnet restore

Step 4: Build Project

- Build project
 - dotnet build
 - Expected output: Build succeeded.

Step 5: Run Backend API

- Run in development mode

 - dotnet run

Step 6: Verify API is Running

- Open web browser
- Navigate to: <http://localhost:5000/swagger>
- You should see Swagger UI with all API endpoints

Lssctc.ProgramManagement 1.0 OAS 3.0

Select a definition Lssctc.ProgramManagement v1

Authorize

Activities

- GET** /api/Activities
- POST** /api/Activities
- GET** /api/Activities/paged
- GET** /api/Activities/{id}
- PUT** /api/Activities/{id}
- DELETE** /api/Activities/{id}

File: screenshot_swagger_ui_homepage.png

```

{
  "openapi": "3.0.1",
  "info": {
    "title": "Lssctc.ProgramManagement",
    "version": "1.0"
  },
  "paths": {
    "/api/Activities": {
      "get": {
        "tags": [
          "Activities"
        ],
        "responses": {
          "200": {
            "description": "OK"
          }
        }
      },
      "post": {
        "tags": [
          "Activities"
        ],
        "requestBody": {
          "content": {
            "application/json": {
              "schema": {
                "$ref": "#/components/schemas/CreateActivityDto"
              }
            }
          }
        },
        "text/json": {
          "schema": {
            "$ref": "#/components/schemas/CreateActivityDto"
          }
        },
        "application/*+json": {
          "schema": {
            "$ref": "#/components/schemas/CreateActivityDto"
          }
        }
      }
    }
  }
}
  
```

4. Test authentication endpoint:

- Expand **POST /api/Authens/login-username**

- Click **Try it out**
- Enter test credentials (if seeded)
- Click **Execute**
- Verify 200 OK response with JWT token

The screenshot shows a POST request to the endpoint `/api/Authens/login-username`. The request body is a JSON object:

```
{
  "username": "admin1",
  "password": "admin1"
}
```

The 'application/json' media type is selected for the request body. At the bottom, there is a large blue 'Execute' button.

2.3.4 Setup and Run Frontend Web Application

This section outlines how to configure, run, and verify the frontend client interface.

Step 1: Installation

- Navigate to the project directory and install the required dependencies.

Step 2: Environment Configuration

- Set up the connection to the backend and external services.
- Create the configuration file:
- Windows: copy .env.example .env
- macOS/Linux: cp .env.example .env
- Edit the .env file
- Optional: Google OAuth Setup To enable "Sign in with Google," create a project in the Google Cloud Console:
 - Type: OAuth 2.0 Web Application
 - Origin: http://localhost:5173
 - RedirectURI: http://localhost:5173/auth/callback
 - Action: Paste the generated Client ID into your .env file.

Step 5: Production Build (Optional)

- To prepare the application for final deployment:

- Build: Run npm run build to generate the dist/ folder.
- Preview: Run npm run preview to test the build at http://localhost:5173.

2.3.5 Deployment to Production

Backend Deployment Options:

Option 1: Deploy to Azure App Service

1. Install Azure CLI
2. Login to Azure:
3. az login
4. Create App Service:
5. az webapp create --resource-group myResourceGroup --plan myAppServicePlan --name lssctc-api --runtime "DOTNET:8.0"
6. Deploy:
7. dotnet publish -c Release
8. az webapp deploy --resource-group myResourceGroup --name lssctc-api --src-path ./bin/Release/net8.0/publish.zip
9. Configure connection string in Azure Portal
10. Update JWT and Email settings

Option 2: Deploy to Docker Container

1. Create Dockerfile in backend project root:
2. FROM mcr.microsoft.com/dotnet/aspnet:8.0
3. WORKDIR /app
4. COPY ./publish .
5. ENTRYPOINT ["dotnet", "Lssctc.ProgramManagement.dll"]
6. Build and run:
7. dotnet publish -c Release -o ./publish
8. docker build -t lssctc-api .
9. docker run -p 5000:80 lssctc-api

Frontend Deployment Options:

Option 1: Deploy to Vercel

1. Install Vercel CLI:
2. npm install -g vercel
3. Login:

4. `vercel login`
5. Deploy:
6. `vercel --prod`
7. Configure environment variables in Vercel dashboard

Option 2: Deploy to Azure Static Web Apps

1. Build production bundle:
2. `npm run build`
3. Create Static Web App in Azure Portal
4. Connect to GitHub repository
5. Configure build settings:
 - App location: /
 - API location: (empty)
 - Output location: dist
6. Azure will automatically build and deploy on push

Option 3: Deploy to Netlify

1. Install Netlify CLI:
2. `npm install -g netlify-cli`
3. Build:
4. `npm run build`
5. Deploy:
6. `netlify deploy --prod --dir=dist`

Database Deployment:

Deploy to Azure SQL Database

1. Create Azure SQL Database in Azure Portal
2. Export local database using SSMS:
 - Right-click database → Tasks → Generate Scripts
 - Select all objects
 - Save script
3. Connect to Azure SQL Database
4. Execute script to create schema

Update connection string in backend configuration

3. User Manual

3.1 Terms and definitions

Term	Definition
LSSCTC	Learner Management and 3D Simulation System for Crane Training Center
Admin	System administrator with full access to all features and user management
Instructor	Teacher/trainer who creates course content, quizzes, and evaluates trainees
Trainee	Student enrolled in crane operation training courses
Program Manager	Role responsible for curriculum design and course orchestration
Simulation Manager	Role responsible for managing 3D simulation components and scenarios
Training Program	Complete curriculum consisting of multiple courses leading to certification
Course	Individual training module covering specific crane operation topics
Section	Subdivision within a course containing organized activities
Activity	Learning task within a section (material, quiz, or practice)
Learning Material	Educational content (PDF, video, image, URL) provided to trainees
Quiz	Assessment containing multiple-choice or single-choice questions
Practice	Hands-on simulation task for skill development and evaluation
Class	Group of trainees enrolled in a program with scheduled sessions
Timeslot	Scheduled session for class instruction with date, time, and instructor
Enrollment	Trainee's registration and participation in a specific class
Activity Record	Trainee's progress and completion status for an activity
Quiz Attempt	Trainee's submission of a quiz with scored results
Practice Attempt	Trainee's completion of a practice session with performance metrics
Simulation	3D model or asset used in crane operation simulation

Component	environment
Brand Model	Specific crane manufacturer and model configuration
JWT	JSON Web Token - authentication token for API access
OTP	One-Time Password - 6-digit code for password reset verification
WebGL	Web Graphics Library - browser technology for 3D rendering

3.2 System requirements

For End Users (Trainees, Instructors):

- Operating System:
 - Windows 10/11 (64-bit)
 - macOS 10.15 (Catalina) or later
 - Linux (Ubuntu 20.04+ or equivalent)
- Web Browser:
 - Google Chrome 90+ (Recommended)
 - Mozilla Firefox 88+
 - Safari 14+ (macOS only)
 - Microsoft Edge 90+
- Internet Connection:
 - Minimum: 5 Mbps (for video streaming and general use)
 - Recommended: 10 Mbps (for 3D simulation)
- Display Resolution:
 - Minimum: 1366x768
 - Recommended: 1920x1080 or higher
- Input Devices:
 - Mouse and keyboard (required)
 - Trackpad supported but not recommended for simulation

For Simulation Features:

- RAM:
 - Minimum: 8GB
 - Recommended: 16GB
- Graphics Card:
 - Dedicated GPU with WebGL 2.0 support
 - NVIDIA GTX 1050 or equivalent
 - AMD Radeon RX 560 or equivalent
- Storage:
 - 2GB free space for cached 3D models and textures
- CPU:
 - Minimum: Intel Core i5 or AMD Ryzen 5
 - Recommended: Intel Core i7 or AMD Ryzen 7

For System Administrators:

- All of the above, plus:
- Access to SQL Server Management Studio or Azure Data Studio
- Network access to application server and database server

Remote desktop or SSH access to servers (for on-premise deployment)

3.3 Application Usage

a. Overview

The LSSCTC system is a web-based Learning Management System integrated with 3D crane operation simulation capabilities. It consists of:

1. Frontend (Web Application): React-based single-page application
2. Backend (API): .NET 8 RESTful API with JWT authentication
3. Database: SQL Server relational database
4. 3D Engine: WebGL-based simulation environment (planned)

b. Feature 1: Authentication & User Management

Purpose: Secure user authentication with multiple login methods and role-based access control

Available Functions:

1. Login with Username/Password
2. Login with Email/Password
3. Login with Google OAuth
4. Password Reset (OTP-based)
5. Logout

Profile View and Update

c. Feature 2: Admin - Course Management

Purpose: Create, organize, and manage training courses

Available Functions:

1. View All Courses (with pagination, search, sort)
2. Create New Course
3. Edit Course Details
4. Delete Course (soft delete)
5. Assign Course to Programs

View Course Enrollments

d. Feature 3: Admin - Class Management

Purpose: Organize trainees into classes, assign instructors, and manage schedules

Available Functions:

1. View All Classes
2. Create New Class
3. Edit Class Details
4. View Class Enrollments
5. Approve/Reject Enrollments
6. Manage Class Timeslots (Schedule)

Assign Instructors

e. Feature 4: Instructor - Quiz Management

Purpose: Create assessments to evaluate trainee knowledge and understanding

Available Functions:

1. Create Quiz with Questions
2. Import Quiz from Excel Template
3. Edit Quiz and Questions
4. Delete Quiz
5. Assign Quiz to Activity

View Quiz Attempts and Results

Create Quiz:

Step-by-Step Instructions:

1. Login as Instructor
2. Navigate to Instructor Dashboard
3. Click "Quizzes" in sidebar

#	Tên	Thời gian (phút)	Điểm đậu	Tổng điểm	Thao tác
1	Quiz test	25	6 điểm	10 điểm	

4. Quizzes list page displays showing your created quizzes

The screenshot shows a user interface for managing quizzes. On the left, a sidebar menu includes 'Giảng viên' (Teacher), 'Bảng điều khiển' (Control Panel), 'Lịch dạy' (Teaching Schedule), 'Lớp học' (Class), 'Tài liệu' (Materials), 'Bài kiểm tra' (Quiz), and 'Thực hành' (Practice). The main area is titled 'Bài kiểm tra' and displays a table with one row. The table columns are '#', 'Tên' (Name), 'Thời gian (phút)' (Time in minutes), 'Điểm đầu' (Starting point), 'Tổng điểm' (Total points), and 'Thao tác' (Actions). The row contains the value 'Quiz test' under 'Tên', '25' under 'Thời gian (phút)', '6 điểm' (6 points) under 'Điểm đầu', '10 điểm' (10 points) under 'Tổng điểm', and icons for edit, delete, and view under 'Thao tác'. Below the table is a pagination bar showing '1-1 trong tổng số 1 bài kiểm tra' and '1 / page'. At the bottom left is an 'instructor' profile icon.

5. Click "Create New Quiz" button

The screenshot shows a modal window titled 'Tạo Bài kiểm tra' (Create Quiz) over a background of the 'Bài kiểm tra' page. The modal has fields for 'Tên Bài kiểm tra' (Quiz name) with placeholder 'VD: Kiến thức An toàn Cơ bản', 'Điểm đầu (diểm)' (Starting point points) with value '5', 'Thời gian (phút)' (Time in minutes) with value '20', and a 'Mô tả' (Description) field with placeholder 'Mô tả tùy chọn'. Below the modal, the 'Câu hỏi' (Question) section is visible, showing a summary: 'Tổng điểm Bài kiểm tra' (Total points Quiz) is '10.00 / 10', 'Câu hỏi' (Question) is '1', 'Tổng điểm' (Total points) is '10.00', 'TB / Câu' (Average per question) is '10.00', and 'Điểm còn lại' (Remaining points) is '0.00'. A green box at the bottom right of the 'Câu hỏi' section says 'Tổng điểm phải bằng 10' (Total points must be 10). The 'Câu hỏi 1' (Question 1) section below has fields for 'Nội dung Câu hỏi' (Question content) with placeholder 'Vui lòng nhập nội dung câu hỏi.', 'Điểm' (Points) with value '10.00', and 'Mô tả' (Description) with placeholder 'Mô tả (tùy chọn)'.

6. Quiz creation form opens (may be multi-step)

Step 1: Quiz Basic Information

X Tạo Bài kiểm tra

X Hủy

Tạo Bài kiểm tra

* Tên Bài kiểm tra

VD: Kiến thức An toàn Cơ bản

* Điểm đậu (diểm)

5

* Thời gian (phút)

20

Mô tả

Mô tả tùy chọn

Câu hỏi

Tổng điểm Bài kiểm tra

10.00 / 10

Câu hỏi

1

Tổng điểm

10.00

TB / Câu

10.00

Điểm còn lại

0.00

Tổng điểm phải bằng 10

1 Câu hỏi 1

10 điểm



Nội dung Câu hỏi *

Vui lòng nhập nội dung câu hỏi

Điểm *

10.0

Mô tả

Mô tả (tùy chọn)

7. Fill in quiz information:

- Quiz Name: "Mobile Crane Safety Assessment"
- Description: "Test your knowledge of crane safety procedures"
- Duration: 30 minutes

- Passing Score: 7

8. Click "Next"

Step 2: Add Questions

INSERT SCREENSHOT HERE: Add Questions Section

The screenshot shows a user interface for adding a question. At the top left is a blue circle with the number '1'. To its right is the text 'Câu hỏi 1'. In the top right corner, there is a blue button labeled '10 điểm' and a red trash icon. Below this, there are two input fields: 'Nội dung Câu hỏi *' containing the placeholder 'Vui lòng nhập nội dung câu hỏi' and 'Điểm *' containing '10.0'. Underneath these is a 'Mô tả' field with the placeholder 'Mô tả (tùy chọn)'. Below that is a 'Tùy chọn' section. It contains a green box with a white border. Inside the box, there is a radio button labeled 'A' next to the text 'Tùy chọn 1'. Below it is another row with a checked checkbox labeled '✓ Đáp án đúng' and a green button labeled '10.0 điểm'. A text input field below this row contains the placeholder 'Giải thích cho đáp án này (tùy chọn)'. At the bottom of the green box is a '+ Thêm câu hỏi' button. Outside the green box, at the bottom center, is another '+ Thêm câu hỏi' button.

9. Click "Add Question" button

10. Question form appears

1 Câu hỏi 1

Nội dung Câu hỏi * **Điểm ***

Vui lòng nhập nội dung câu hỏi **10.0**

Mô tả

Mô tả (tùy chọn)

Tùy chọn **+ Thêm**

A Tùy chọn 1 **Đáp án đúng** **10.0 điểm**

Giải thích cho đáp án này (tùy chọn)

+ Thêm câu hỏi

11. Fill in question details:

- Question Text: "What is the safe minimum distance from a power line for crane operations?"
- Score Points: 10
- Explanation: "Regulations often require at least 10 meters depending on voltage."

12. Add Options:

- Click "Add Option" button for each option

INSERT SCREENSHOT HERE: Add Option Interface

Tùy chọn **+ Thêm**

A Tùy chọn 1 **Đáp án đúng** **2.5 điểm**

Giải thích cho đáp án này (tùy chọn)

B Tùy chọn 2 **Đáp án đúng** **0.0 điểm**

Giải thích cho đáp án này (tùy chọn)

13. Enter options:

- Option 1: "1 meter" (not correct)
- Option 2: "3 meters" (not correct)
- Option 3: "10 meters" (check "Is Correct")
- Option 4: "50 meters" (not correct)

1 Câu hỏi 1 2.5 điểm trash

Nội dung Câu hỏi * Điểm *
What is the safe minimum distance from a power line for crane operation? 2.5

Mô tả
Regulations often require at least 10 meters depending on voltage.

Tùy chọn + Thêm

A 1 meter trash 0.0 điểm
 Đáp án đúng
Giải thích cho đáp án này (tùy chọn)

B 3 meter trash 0.0 điểm
 Đáp án đúng
Giải thích cho đáp án này (tùy chọn)

C 10 meter trash 2.5 điểm
 ✓ Đáp án đúng
Giải thích cho đáp án này (tùy chọn)

D 50 meter trash 0.0 điểm
 Đáp án đúng
Giải thích cho đáp án này (tùy chọn)

14. Click "Save Question"

15. Question is added to quiz questions list

Bài kiểm tra

1-2 trong tổng số 2 bài kiểm tra

Create quiz successfully

Nhập từ Excel

+ Tạo Bài kiểm tra

#	Tên	Thời gian (phút)	Điểm đậu	Tổng điểm	Thao tác
1	Mobile Crane Safety Assessment	30	7 điểm	10 điểm	
2	Quiz test	25	6 điểm	10 điểm	

1-2 trong tổng số 2 bài kiểm tra < 1 > 10 / page

16. Repeat steps 9-15 to add more questions

- Add at least 2-10 questions per quiz

Bài kiểm tra

1-2 trong tổng số 2 bài kiểm tra

Create quiz successfully

Nhập từ Excel

+ Tạo Bài kiểm tra

#	Tên	Thời gian (phút)	Điểm đậu	Tổng điểm	Thao tác
1	Mobile Crane Safety Assessment	30	7 điểm	10 điểm	
2	Quiz test	25	6 điểm	10 điểm	
3	Quiz 3	30	7 điểm	10 điểm	

1-2 trong tổng số 2 bài kiểm tra < 1 > 10 / page

17. Review Quiz:

- Check all questions are added
- Verify total points
- Ensure at least one correct option per question

18. Click "Save Quiz" button

19. Success message: "Quiz created successfully"

The screenshot shows a web-based quiz management system. At the top, there's a blue header bar with the title "Bài kiểm tra" and a message "Create quiz successfully". Below the header is a search bar with placeholder text "Tim kiem bài kiểm tra..." and a magnifying glass icon. To the right of the search bar are two buttons: "Nhập từ Excel" and "+ Tạo Bài kiểm tra". The main content area displays a table of quizzes:

#	Tên	Thời gian (phút)	Điểm đậu	Tổng điểm	Thao tác
1	Mobile Crane Safety Assessment	30	7 điểm	10 điểm	
2	Quiz test	25	6 điểm	10 điểm	

At the bottom of the table, there's a page navigation section with the text "1-2 trong tổng số 2 bài kiểm tra", a page number "1", and a dropdown menu "10 / page".

API Endpoint Used:

POST /api/Quizzes/with-questions

Request Body:

```
{  
  "name": "Mobile Crane Safety Assessment",  
  "description": "Test your knowledge.. .",  
  "durationMinutes": 30,  
  "passingScore": 70,  
  "isRandomizeQuestions": true,  
  "isRandomizeOptions": true,  
  "showCorrectAnswers": true,  
  "isActive": true,  
  "questions": [  
    {  
      "questionText": "What is the safe minimum distance.. .",  
      "score": 2.5,  
      "isMultiple": false,  
      "options": [  
        {"text": "A", "isCorrect": false},  
        {"text": "B", "isCorrect": true},  
        {"text": "C", "isCorrect": false},  
        {"text": "D", "isCorrect": false}  
      ]  
    }  
  ]  
}
```

```
"explanation": "Regulations often require.. .",
  "options": [
    { "optionText": "1 meter", "isCorrect": false },
    { "optionText": "3 meters", "isCorrect": false },
    { "optionText": "10 meters", "isCorrect": true },
    { "optionText": "50 meters", "isCorrect": false }
  ],
},
{ ... more questions... }
]
}
```

Response (200 OK):

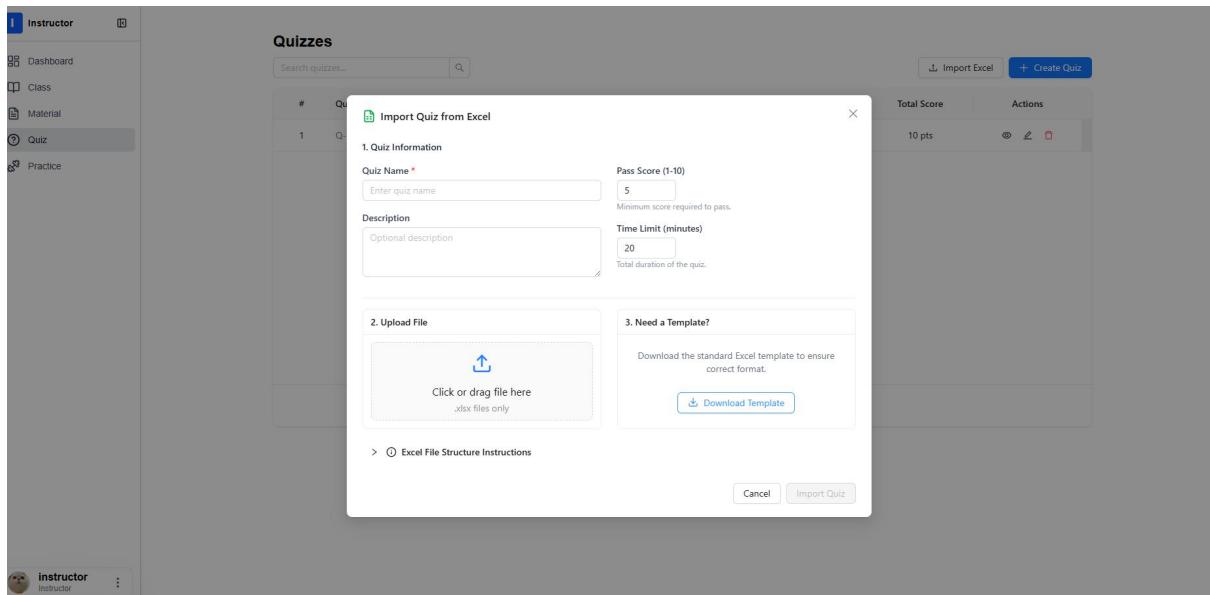
```
{
  "status": 200,
  "message": "Create quiz successfully",
  "data": { "quizId": 45 }
}
```

Import Quiz:

Import Quiz from Excel

Step-by-Step Instructions:

1. Download Excel template first:
 - Navigate to Quizzes page
 - Click "Import Quiz" dropdown
 - Select "Download Template"



2. Template Excel file downloads

Crane_Training_Quiz_Template.xlsx - Protected View - Saved to this PC

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. [Enable Editing](#)

A	B	C	D	E	F	G	H	I
Question Name	Score	Is Multiple	Description	Option Name	Is Correct	Explanation		
2. What must the operator check before operating the crane?	2.5	FALSE	Safety Check	Check engine oil, coolant, tires, and brake system.	TRUE	Mandatory safety procedure.		
3. What must the operator check before operating the crane?	2.5	FALSE	Safety Check	Just check if the key is present.	FALSE	Incorrect and dangerous.		
4. When deploying outriggers, which requirement is correct?	2.5	FALSE	Crane Technique	Fully extend outriggers and use pads on soft ground.	TRUE	Ensures maximum stability.		
5. When deploying outriggers, which requirement is correct?	2.5	FALSE	Crane Technique	Extend outriggers halfway to save space.	FALSE	Risk of tipping over.		
6. Hand signal: Arm extended, palm down, moving hand horizontally means?	2.5	FALSE	Hand Signals	Emergency Stop.	TRUE	Standard ISO signal.		
7. Hand signal: Arm extended, palm down, moving hand horizontally means?	2.5	FALSE	Hand Signals	Raise the boom.	FALSE	Incorrect signal.		
8. Which action is STRICTLY PROHIBITED when operating a crane?	2.5	FALSE	Safety Rules	Using the crane hook/bucket to lift people.	TRUE	Strictly forbidden by safety regulations.		
9. Which action is STRICTLY PROHIBITED when operating a crane?	2.5	FALSE	Safety Rules	Operating at night with proper lighting.	FALSE	Allowed if visibility is good.		
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19.								
20.								
21.								
22.								
23.								
24.								
25.								
26.								
27.								
28.								
29.								
30.								
31.								

3. Fill in template:

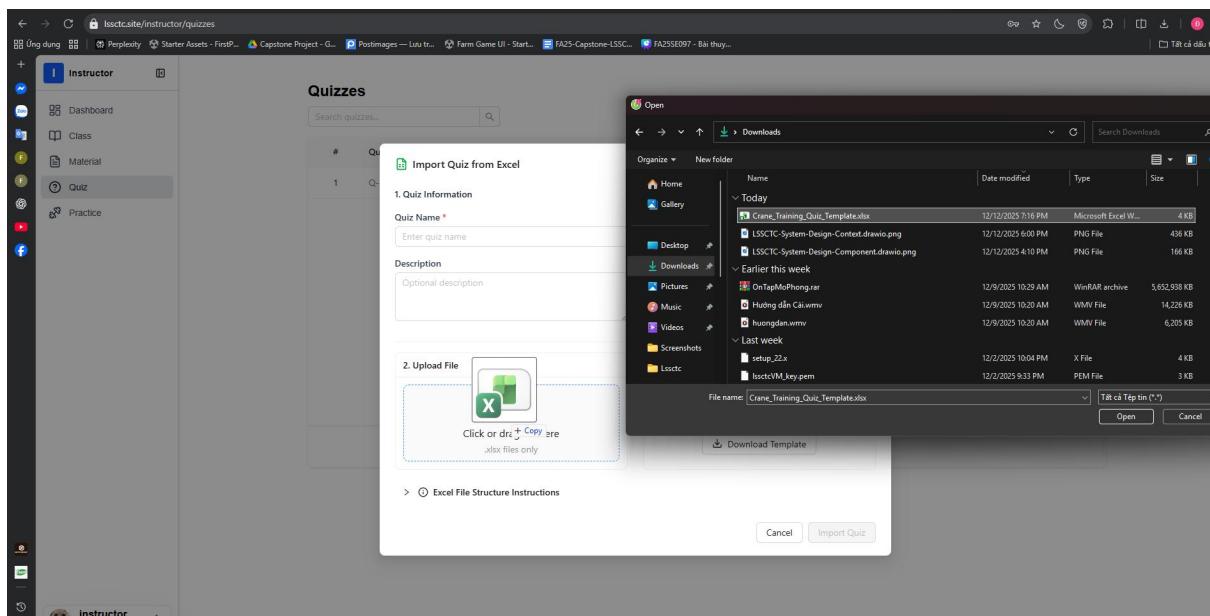
- Each question can have multiple rows (one per option)
- Question Name must be same for all options of same question
- Is Multiple: true/false
- Is Correct: true/false (only ONE true for single choice)

Crane_Training_Quiz_Template.xlsx - Protected View • Saved to this PC

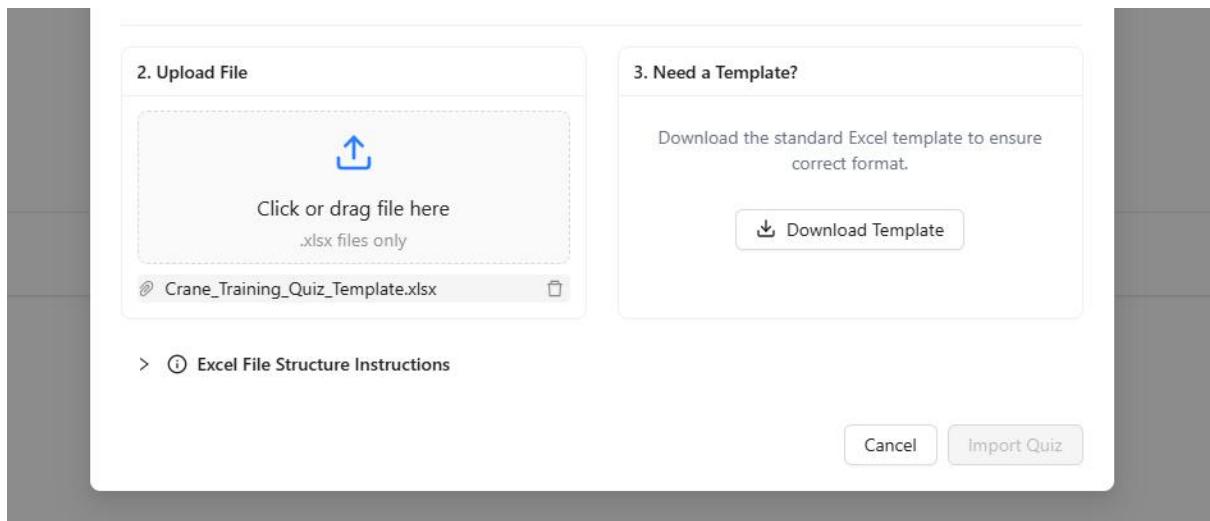
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. [Enable Editing](#)

A	B	C	D	E	F	G	H	I
Question Name	Score	Is Multiple	Description	Option Name	Is Correct	Explanation		
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Which action is STRICTLY PROHIBITED when operating a crane?	2,5	FALSE	Safety Rules	Operating at night with proper lighting.	FALSE	Allowed if visibility is good.		

4. Save Excel file as .xlsx format
5. Return to Quizzes page
6. Click "Import Quiz" → "Import from Excel"



7. Drag file into drop zone or click "Browse Files"
8. Select your filled Excel file
9. File name appears in dialog



f. Feature 5: Simulation Practice

1. Download file exe

LSSCTC Trang chủ Chương trình Mô phỏng Giới thiệu Đăng nhập Vie

Trang chủ > Simulator

Nền tảng Mô phỏng 3D

Tải xuống và cài đặt ứng dụng mô phỏng cần cầu 3D để thực hành các tình huống vận hành với vật lý thực tế và theo dõi đánh giá.

[Tải File](#) [Link Dự phòng](#)

[Phiên bản Mô phỏng Mới nhất](#)

Phiên bản: v1.0.0 • Kích thước ước tính: 450MB • Nền tảng: Windows 10/11 (64-bit)

[Tải Mô phỏng](#)

Hướng dẫn Cài đặt

- Nhập vào [Tải Mô phỏng](#) để tải trình cài đặt (.exe).
- Xác minh chữ ký file nếu chính sách của bạn yêu cầu (nhấp chuột phải → Properties → Digital Signatures).
- Chạy trình cài đặt và làm theo các bước trên màn hình. Chấp nhận các phần phụ thuộc cần thiết (Visual C++ runtime, DirectX) nếu được nhắc.
- Khởi chạy ứng dụng. Lần đầu tiên khởi động, bạn sẽ được yêu cầu nhập thông tin đăng nhập (giống như đăng nhập web).
- Cho phép truy cập ra ngoài để theo dõi dữ liệu thời gian thực (công 443).

Tổng quan Sử dụng

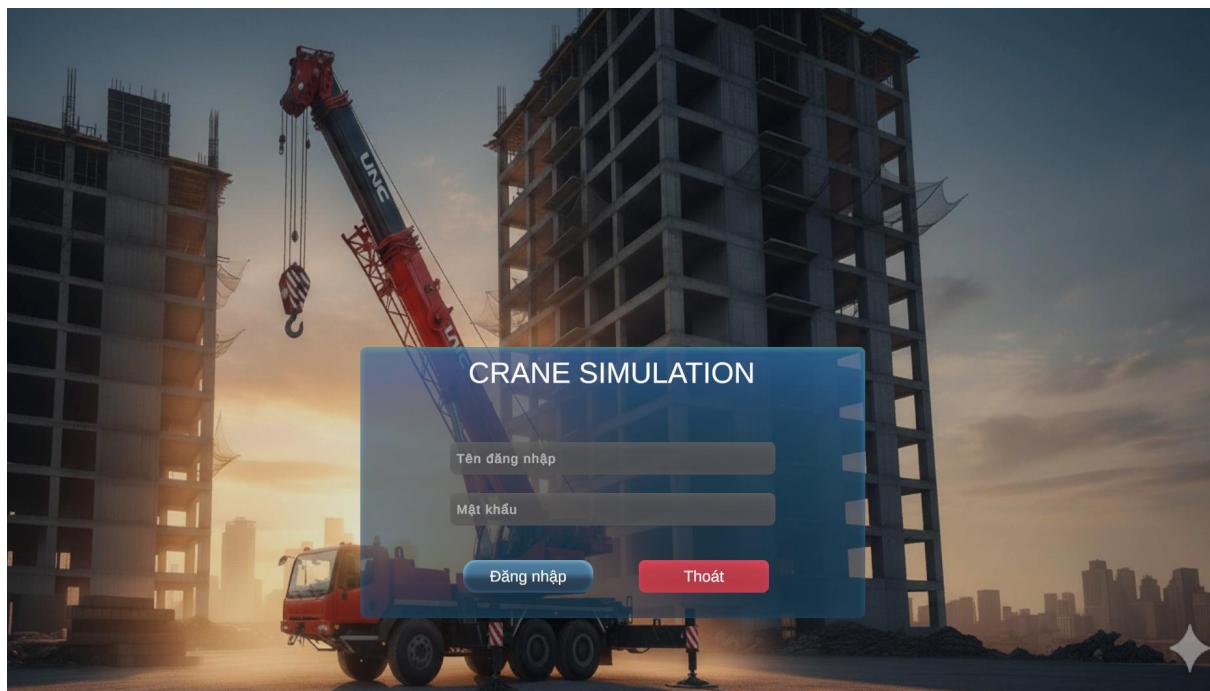
Sau khi đăng nhập, chọn một **Tình huống** từ bảng bên trái. Mỗi tình huống mô tả các mục tiêu cần thiết và ngưỡng an toàn.

- Ánh xạ Điều khiển:** Mở Settings → Controls để xem cách bố trí joystick / bàn phím.
- Bảng Telemetry:** Các chỉ số tải, góc cần cầu, tốc độ gió và lề an toàn theo thời gian thực.
- Chế độ Đánh giá:** Khi được bật, các hành động của bạn sẽ được ghi lại để giảng viên xem xét.

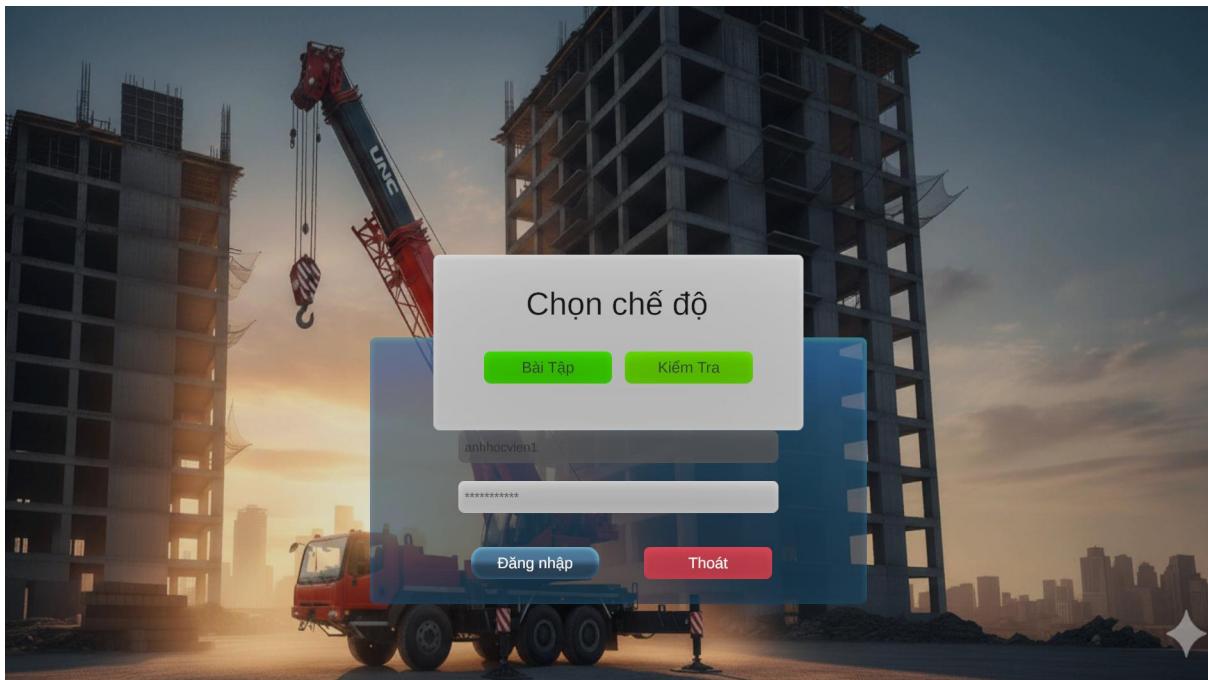
2. Open CraneSimulator.exe file

Name	Date modified	Type	Size
CraneSimulator_BurstDebugInformation....	12/12/2025 8:08 PM	File folder	
CraneSimulator_Data	12/12/2025 8:09 PM	File folder	
D3D12	12/12/2025 8:08 PM	File folder	
MonoBleedingEdge	12/12/2025 8:08 PM	File folder	
CraneSimulator.exe	12/12/2025 8:08 PM	Application	657 KB
UnityCrashHandler64.exe	12/12/2025 8:08 PM	Application	1,496 KB
UnityPlayer.dll	12/12/2025 8:08 PM	Application extens...	32,888 KB

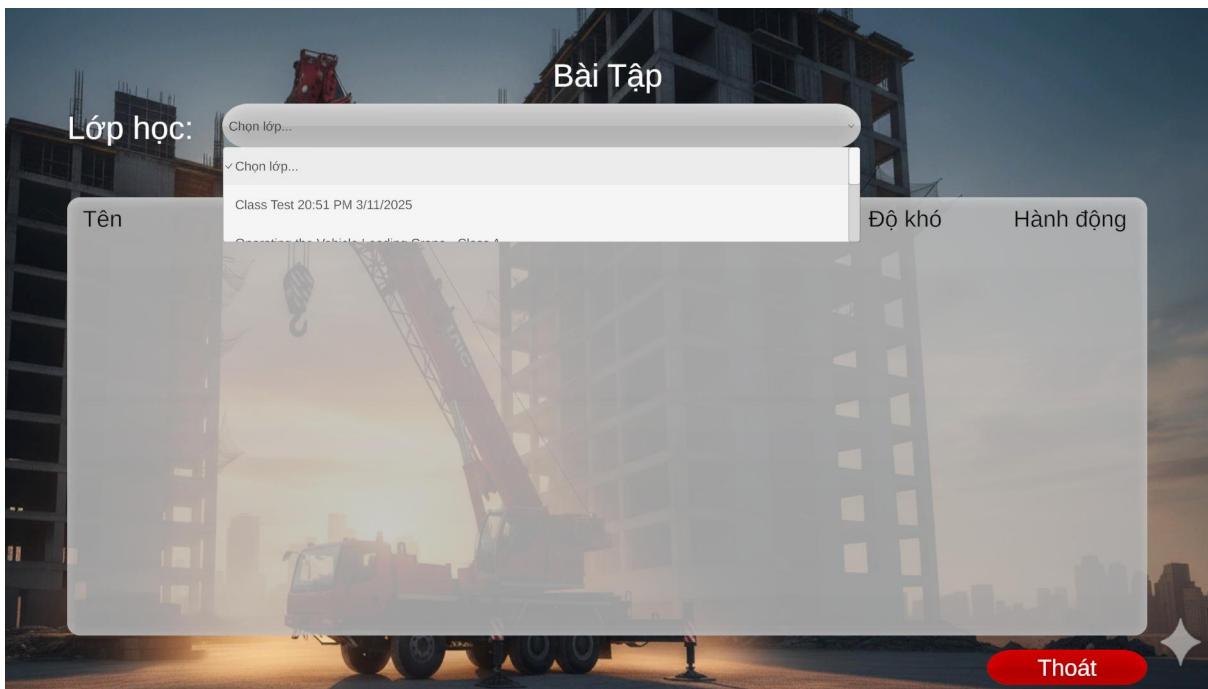
3. Login with username, password



4. Select practice mode



5. Select Class



6. Select practice to start

Bài Tập

Lớp học: Ôn tập an toàn & vận hành xe cẩu tự hành (Crane)

Tên	Mô tả	Thời gian	Độ khó	Hành động
Kiểm tra thiết bị	Học viên phải di quanh cần cẩu và kiểm tra tất cả các bộ phận như móc cẩu, cần chính, chân chống, trụ xoay và bảng điều khiển.	10 min	Cơ bản	Bắt đầu

Thoát

7. Finish practice

3.4 Troubleshooting

[Descript some common troubles while using application.]
