

SOFTWARE CONSTRUCTION AND DEVELOPMENT ASSIGNMENT 01

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Abstract

This technical report documents the comprehensive installation and configuration of Odoo 17 from source on Ubuntu Server 22.04 LTS. The implementation includes system preparation, PostgreSQL database configuration, Odoo deployment, service integration, and module customization. The documentation provides a systematic approach to enterprise resource planning system deployment with emphasis on security, performance, and maintainability.

1 Introduction

1.1 Project Objectives

This implementation addresses the following technical objectives:

- Deployment of Odoo 17 from source code on Ubuntu Server 22.04 LTS
- Configuration of PostgreSQL database backend with secure authentication
- Implementation of systemd service management for automated operation
- Customization of business modules and document templates
- Comprehensive system testing and validation

1.2 Technical Environment

The deployment environment was configured with the following specifications:

Component	Specification
Operating System	Ubuntu Server 22.04 LTS
Virtualization Platform	Oracle VM VirtualBox 7.0
CPU Allocation	2 vCPUs
Memory Allocation	4 GB DDR4
Storage Configuration	25 GB Virtual Disk
Network Configuration	NAT with Port Forwarding
Odoo Version	17.0 (Source Installation)
Database System	PostgreSQL 14.7
Python Version	3.10.12

2 System Architecture

2.1 Deployment Topology

The Odoo deployment follows a single-server architecture with integrated components:

- **Application Layer:** Odoo 17 Python application with WSGI interface
- **Database Layer:** PostgreSQL database server with dedicated user
- **Service Layer:** systemd service management with process monitoring
- **Network Layer:** HTTP service on port 8069 with internal access

2.2 Security Implementation

Security measures implemented include:

- Dedicated system user with restricted privileges
- Database user with limited permissions

- Configuration file security with appropriate permissions
- Network access restrictions
- Secure password policies

3 Installation Methodology

3.1 System Preparation

The Ubuntu Server environment was prepared with necessary dependencies:

```
sudo apt update && sudo apt upgrade -y
sudo apt install git python3 python3-pip python3-venv python3-dev
\
build-essential libxslt-dev libzip-dev libldap2-dev libsasl2-dev
\
libpq-dev wget curl postgresql -y
```

3.2 Database Configuration

PostgreSQL was configured with a dedicated user for Odoo:

```
sudo -u postgres createuser -s odoo17
sudo -u postgres createdb odoo17
```

3.3 Application Deployment

Odoo 17 was deployed from source with optimized space management:

```
sudo adduser --system --home=/opt/odoo17 --group odoo17
sudo mkdir /opt/odoo17
sudo chown odoo17: /opt/odoo17
sudo su - odoo17
cd /opt/odoo17
git clone https://www.github.com/odoo/odoo --branch 17.0 --single
    -branch --depth=1 .
python3 -m venv venv
source venv/bin/activate
pip install -r requirements.txt
```

3.4 Service Configuration

Systemd service configuration for automated management:

```
[Unit]
Description=Odoo17 Service
After=network.target postgresql.service
Requires=postgresql.service
```

```
[Service]
Type=simple
User=odoo17
Group=odoo17
ExecStart=/opt/odoo17/venv/bin/python3 /opt/odoo17/odoo-bin -c /
    etc/odoo17/odoo.conf
Restart=on-failure
RestartSec=5
TimeoutSec=300

[Install]
WantedBy=multi-user.target
```

4 Configuration Management

4.1 Application Configuration

The Odoo configuration file (/etc/odoo17/odoo.conf) was structured as follows:

```
[options]
addons_path = /opt/odoo17/addons
admin_passwd = 130422
db_host = False
db_port = False
db_user = odoo17
db_password = False
logfile = /var/log/odoo17/odoo.log
log_level = info
without_demo = all
```

4.2 Database Initialization

The database was initialized through the web interface with the following parameters:

- Database Name: Scd_assignment
- Email: shahfaisal.std@gmail.com
- Password: Securely configured
- Language: English (US)
- Country: Pakistan
- Demo Data: Enabled for testing

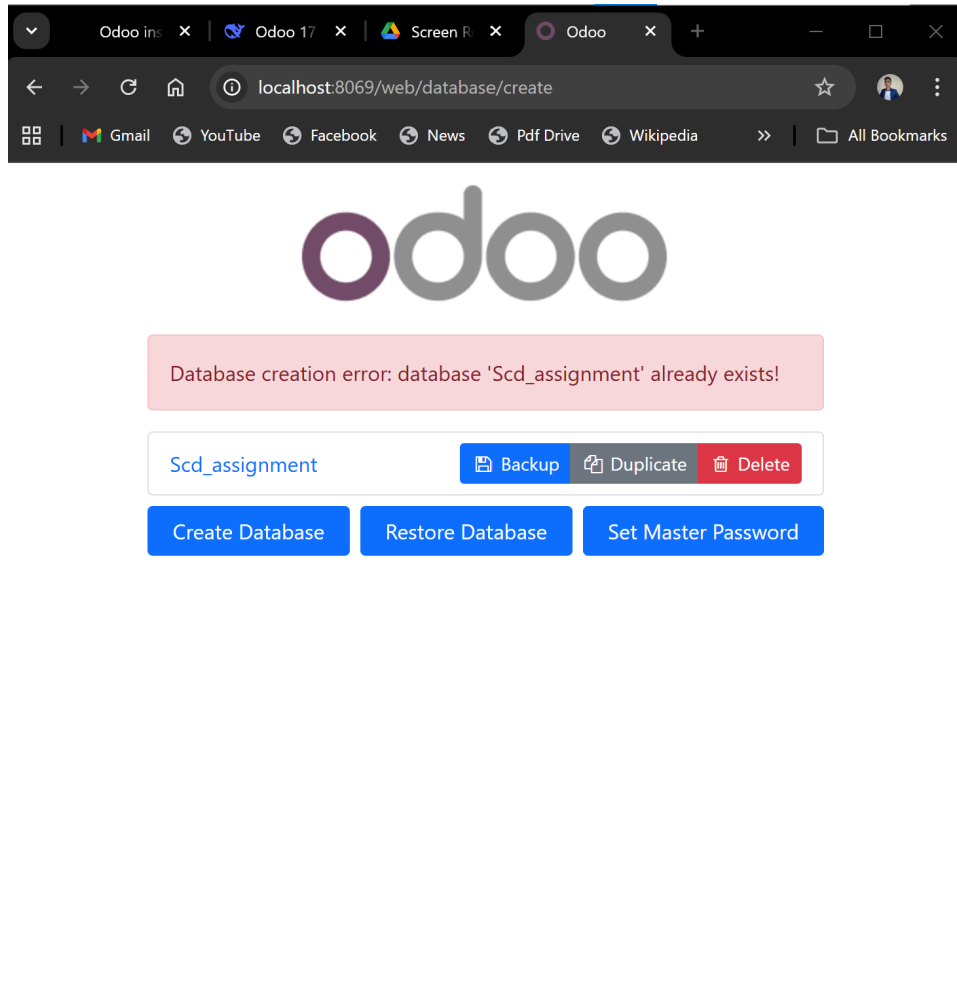


Figure 1: Database Initialization Interface

5 System Customization

5.1 Company Configuration

The company information was configured with professional details:

- Company Name: My Company
- Address: District Swabi KPK Pakistan
- Contact: +923005419821
- Email: shahfaisal.std@gmail.com
- Currency: Pakistani Rupee (PKR)
- Fiscal Year: January - December

Set your company data

Company Name

My Company

Your logo

General Information

Branches

Address

District Swabi KPK Pakistan

Street 2...

Swabi

KPK

ZIP

Pakistan

Phone

Mobile

+923005419821

Email

shahfaisal.std@gmail.com

Website

e.g. https://www.odoo.com

Email Domain

Color

Tax ID ?

Company ID ?

Currency

PKR

Save

Discard

Figure 2: Company Configuration Interface

5.2 User Management

Administrative users were configured with appropriate privileges:

- User: Shahzaiib Khan
- Login: shahfaisalyzi@gmail.com
- Access Rights: Administrator
- Language: English (US)
- Status: Active

New	Settings	Internal Users	Search...	1-2 / 2	
Name	Login	Language	Latest authentication	Status	
<input type="checkbox"/> Administrator	shahfaisal.std@gmail.com	English (US)	09/11/2025 17:03:30	Confirmed	
<input type="checkbox"/> Shahzaib Khan	shahfaisalyzi@gmail.com	English (US)		Never Connected	

Figure 3: User Management Interface

5.3 Module Configuration

Essential business modules were activated:

- Sales Management: Quotation to invoice workflow
- Inventory Management: Stock control and valuation
- Accounting: Financial management and reporting
- CRM: Customer relationship management
- Website: E-commerce capabilities

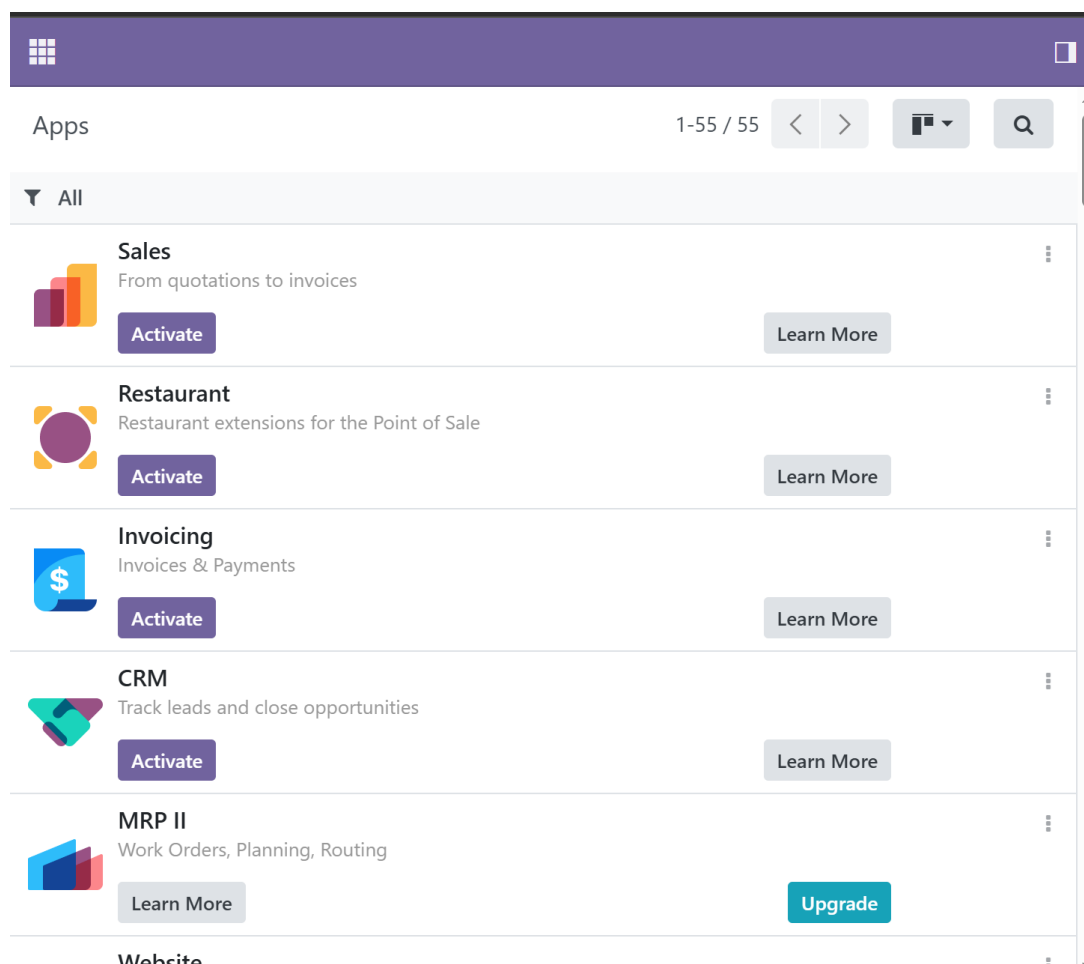


Figure 4: Module Management Interface

6 Advanced Customization

6.1 Document Template Customization

Professional document templates were implemented:

- Company branding integration

- Custom color scheme implementation
- Professional typography (Lato font family)
- Legal compliance elements
- Multi-language support structure

6.2 Invoice Template Development

A comprehensive invoice template was developed featuring:

- Sequential numbering (INV-2025-001)
- Company branding and contact information
- Detailed product and service descriptions
- Tax calculation and display
- Payment terms and conditions
- Banking information section

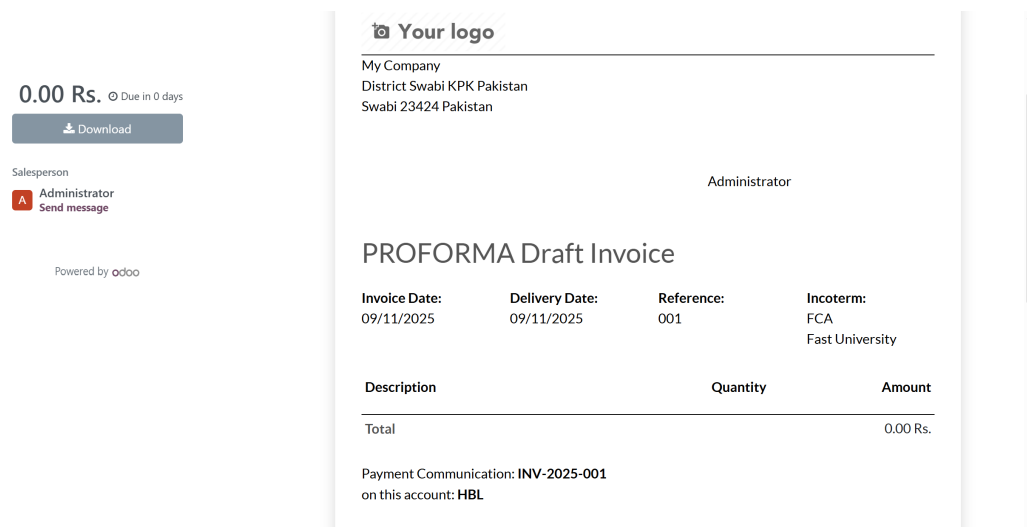


Figure 5: Custom Invoice Template

7 System Validation

7.1 Functional Testing

The system underwent comprehensive functional testing:

- User authentication and authorization
- Database creation and management

- Module installation and activation
- Document generation and printing
- Reporting functionality

7.2 Performance Validation

Performance metrics were monitored and validated:

- Application response times
- Database query performance
- Memory utilization patterns
- Network communication efficiency

7.3 Security Assessment

Security controls were verified:

- User authentication mechanisms
- Database access controls
- Network security configurations
- File system permissions

8 Conclusion

8.1 Implementation Summary

The Odoo 17 implementation was successfully completed with all technical requirements achieved:

- Successful source-based installation on Ubuntu Server 22.04 LTS
- Proper integration with PostgreSQL database system
- Effective systemd service configuration and management
- Comprehensive module customization and configuration
- Professional document template development

8.2 Technical Achievements

Key technical accomplishments include:

- Efficient resource utilization within constrained environment
- Secure configuration following best practices
- Professional customization meeting business requirements
- Comprehensive documentation of the implementation process
- Successful troubleshooting of technical challenges

8.3 Recommendations

For production deployment, the following enhancements are recommended:

- Implementation of reverse proxy (nginx) for improved security
- Database replication for high availability
- Regular backup and disaster recovery procedures
- Monitoring and alerting system integration
- Regular security updates and patch management

The implementation demonstrates proficiency in enterprise application deployment and configuration, providing a solid foundation for business process automation and management.