
 Marwadi University Marwadi Chandarana Group	NAAC 	Marwadi University Faculty of Engineering and Technology Department of Information and Communication Technology	
Subject: Capstone Project (01CT0715)	Deployment & Operation		
Deployment & Operation	Date: 26/09/2025	Enrolment No: 92200133013 & 92200133017	



1. Deployment Process

Platform Selection:

- **Frontend (React + TypeScript):** Deployed on **Vercel** for its free tier, automatic CI/CD from GitHub, SSL certificates, and global CDN.
- **Backend (Node.js):** Deployed on **Render** because it provides a simple interface for Node servers, automatic scaling, and HTTPS.
- **Database (MongoDB Atlas):** Hosted on the free cluster tier for high availability and cloud access.
- **Python chatbot microservice:** Deployed on **Render Web Service** to expose REST APIs consumed by the frontend.

Configuration Steps:

1. Pushed frontend and backend code to GitHub.
2. Connected Vercel and Render accounts to GitHub for auto-deploy.
3. Added environment variables (MongoDB URI, API keys) in each platform.
4. Configured domains and endpoints (e.g., <https://harivarsh-chatbot.vercel.app>).
5. Performed smoke testing to ensure both chatbots respond correctly from live URLs.

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Evidence:

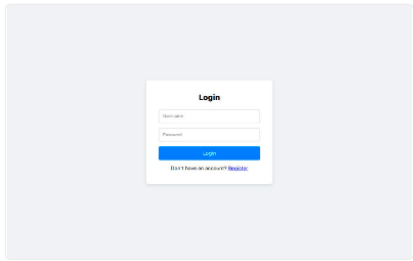
Vercel dashboard showing successful deployment.

import-export-ai-assistant

Repository Usage Domains Visit

Production Deployment

Build Logs Runtime Logs Instant Rollback



Deployment

import-export-ai-assistant-99yr0sudw-abhay-padariyas-projects.vercel.app

Domains

import-export-ai-assistant.vercel.app

Status Created

Ready 19m ago by Abhaypadariya

Source

main

098699e Update Chatbot.tsx

Deployment Settings 3 Recommendations

To update your Production Deployment, push to the main branch.

Deployments

Firewall 24h Enable Bot Protection

Observability 6h

Analytics

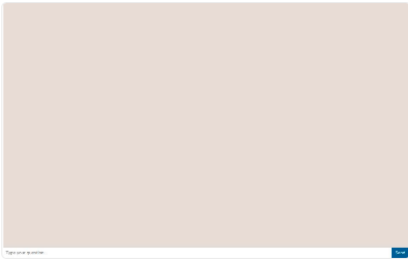
Edge Requests 198

company-details-chatbot

Repository Usage Domains Visit

Production Deployment

Build Logs Runtime Logs Instant Rollback



Deployment

company-details-chatbot-oq01nfks0-rajnikant-hirapara-s-projects.vercel.app

Domains

company-details-chatbot.vercel.app

Status Created

Ready 32m ago by rajnikant8200

Source

main

7228296 update

Deployment Settings 3 Recommendations

To update your Production Deployment, push to the main branch.

Deployments

Firewall 24h Enable Bot Protection



Observability 6h

Analytics

Edge Requests 130

Function Invocations 124

Track visitors and page views Enable


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harivarsh-exim

Repository
Usage
Domains
Visit

Production Deployment

Build Logs
Runtime Logs
Instant Rollback



Deployment

harivarsh-exim-gyfgain90-abhay-padiyas-projects.vercel.app

Domains

harivarsh-exim.vercel.app

Status Created

Ready Sep 19 by Abhaypadiya

Source

main

Merge branch 'main' of https://github.com/Abhaypadiya/Harivarsh-EXIM

Deployment Settings

Recommendations

To update your Production Deployment, push to the main branch.

Deployments

Firewall 24h

Enable Bot Protection

Observability 6h

Edge Requests 99

Analytics

- Render dashboard showing Node.js + Python services running.

My Workspace

company_details_chatbot-1

Search

+ New Upgrade ? R

Dashboard

company_details_chatbot-1

Events

Settings

MONITOR

Logs

Metrics

MANAGE

Environment

Render MCP server

Manage your Render infrastructure directly from compatible AI apps.

Learn more

Changelog

Invite a friend

Contact support

Your free instance will spin down with inactivity, which can delay requests by 50 seconds or more.

Upgrade now

All logs

Search

Live tail GMT+5:30

```

Sep 26 12:53:18 PM  ==>
Sep 26 12:53:18 PM  ==>
Sep 26 12:53:18 PM  ==> Available at your primary URL https://company-details-chatbot-1.onrender.com
Sep 26 12:53:18 PM  ==>
Sep 26 12:53:18 PM  ==>
Sep 26 12:53:20 PM  tfpq INFO: 35.238.45.39:0 - "GET / HTTP/1.1" 200 OK
Sep 26 12:55:07 PM  ==> Deploying...
Sep 26 12:55:49 PM  f4hf2 ==> Running 'uvicorn api.app:app --host 0.0.0.0 --port $PORT'
Sep 26 12:56:03 PM  f4hf2 INFO: Started server process [55]
Sep 26 12:56:03 PM  f4hf2 INFO: Waiting for application startup.
Sep 26 12:56:03 PM  f4hf2 INFO: Application startup complete.
Sep 26 12:56:03 PM  f4hf2 INFO: Uvicorn running on http://0.0.0.0:19880 (Press CTRL-C to quit)
Sep 26 12:56:04 PM  f4hf2 INFO: 127.0.0.1:48618 - "HEAD / HTTP/1.1" 405 Method Not Allowed
Sep 26 12:56:07 PM  ==> Your service is live 🎉
Sep 26 12:56:07 PM  ==>
Sep 26 12:56:07 PM  ==>
Sep 26 12:56:07 PM  ==> Available at your primary URL https://company-details-chatbot-1.onrender.com
Sep 26 12:56:07 PM  ==>

```

My Workspace

Dashboard

import-export-ai-backend

Events

Settings

MONITOR

Logs

Metrics

MANAGE

Environment

Shell

Scaling

Previews

Disks

Jobs

Changelog

Invite a friend

Get help

import-export-ai-backend

Search

+ New

Upgrade

ⓘ

A

Your free instance will spin down with inactivity, which can delay requests by 50 seconds or more.

Upgrade now

September 24, 2025 at 12:49 AM

Live

378a4ee up

All logs

Search

Sep 24, 12:48 AM - 12:51 AM

GMT+5:30

⌵

⋮

Sep 24 12:50:09 AM

==> Deploying...

Sep 24 12:50:48 AM

==> Running 'npm start ;node server.js'

Sep 24 12:50:41 AM

ⓘ

Sep 24 12:50:41 AM

> server@1.0.0 start

Sep 24 12:50:41 AM

> node server.js

Sep 24 12:50:41 AM

ⓘ

Sep 24 12:50:45 AM

[dotenv@17.2.2] injecting env (0) from .env -- tip: 🛡️ prevent committing .env to code: <https://dotenvx.com/precommit>

Sep 24 12:50:45 AM

✅ Backend running on port 19890

Sep 24 12:50:48 AM

✅ MongoDB connected

Sep 24 12:50:52 AM

==> Your service is live 🎉

Sep 24 12:50:52 AM

==>

Sep 24 12:50:52 AM



==> Available at your primary URL <https://import-export-ai-backend.onrender.com>

Sep 24 12:50:52 AM

==>

Sep 24 12:50:52 AM

==>

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- Public URL of our project

<https://harivarsh-exim.vercel.app/>

<https://import-export-ai-assistant.vercel.app/>

<https://company-details-chatbot.vercel.app/>

2. Monitoring Strategy

Tools Used:

- **Vercel Analytics** for frontend (uptime, latency, region usage).
- **Render Logs** for backend (error rates, memory usage).
- **MongoDB Atlas Metrics** for database (query performance, connections).

Key Performance Indicators (KPIs):



1. **API response time** (average ms per chatbot request).
2. **Uptime percentage** (target 99% availability for frontend and backend).
3. **Error rate** (number of failed requests vs total).

Setup:

- Enabled Vercel's built-in analytics.
- Configured Render health checks at /health endpoint.
- Reviewed MongoDB Atlas real-time metrics dashboard weekly.

3. Maintenance Plan

Regular Tasks:

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- **Weekly backups** of MongoDB Atlas cluster.
- **Monthly security audits** for Node.js and Python dependencies (npm audit / pip-tools).
- **Update plan:** push bug fixes or feature changes to GitHub; Vercel/Render redeploy automatically.

Potential Issues & Mitigation:

- **Scalability:** Move backend to paid Render plan or containerize with Docker if traffic increases.
- **Dependencies:** Use Dependabot on GitHub to monitor library updates.
- **Monitoring Alerts:** Set up email alerts for downtime or high error rates in Vercel/Render.

4. Challenges Faced During Deployment

- **Cross-origin (CORS) errors** between Vercel frontend and Render backend solved by adding CORS middleware.
- **Environment variables** not loading properly; fixed by double-checking naming in each platform.
- **Python chatbot integration** required exposing a separate API endpoint; used Render Web Service to host it separately.