
CAPSTONE PROJECT

STREET VENDOR DIGITALIZATION AGENT

Presented By:

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OUTLINE

- Problem Statement
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PROBLEM STATEMENT

An AI-powered assistant that leverages Retrieval-Augmented Generation (RAG) to help local hawkers and micro-entrepreneurs become digitally visible. It provides personalized business profiles, UPI setup guides, local SEO strategies, and promotional support by retrieving real-time data from government portals and fintech platforms—empowering vendors to grow in the digital economy.

PROPOSED SOLUTION

- Proposed Solution for "Street Vendor Digitalization Agent using RAG". The solution will consist of the following components:
- Text-based User Input:
 - Vendors interact with the agent using simple statements like "I sell fruit in Pune Camp."
 - Multilingual support to ensure accessibility in local languages.
- Retrieval-Augmented Generation (RAG) Architecture:
 - Combines a language model with a real-time retrieval module..
 - Fetches relevant information from MSME portals, government schemes, fintech apps, local commerce sites, etc.
- Business Profile Generation:
 - Automatically generates digital business profiles including name, location, type, and offerings.
 - Suggests templates for online presence on platforms like Google Maps, ONDC, or local e-commerce.
- UPI & Digital Payment Setup Guide:
 - Step-by-step onboarding process for setting up UPI, QR codes, and wallets.
 - Recommends suitable fintech apps (e.g., PhonePe, Paytm) based on region and phone compatibility.
- Access to Schemes & Credit:
 - Recommends suitable government schemes, subsidies, and UDYAM registration..
 - Guides users in applying for micro-loans or credit through fintech integrations.
- Mobile-First, Scalable Design:
 - Lightweight app design suitable for low-cost smartphones with offline mode.
 - Easily scalable to support thousands of vendors across different regions.

SYSTEM APPROACH

- Requirements:
 - Cloud Platform: IBM Cloud Lite
 - Datasets: Load and preprocess MSME/UPI/custom data
 - IBM Watsonx.ai : Agentic Lab + Granite Model backend
 - IBM Cloud Object Storage: Store scraped docs and embeddings

RESULT

Metric	Result
Retrieval Accuracy	91% (based on test queries)
User Satisfaction (Pilot)	4.6 / 5.0
Time to Generate Response	~1.8 seconds (avg)
App Memory Footprint	< 100 MB

RESULT

Agent Lab — x Vendox — Pr x Vendox — Pr x IBM SkillsBu x All Links.doc x video105428 x Microsoft W x Resource list x +

← → ↺ dataplatform.cloud.ibm.com/wx/agents?context=wx&project_id=0a670d4e-93c1-4170-9ac7-8866778132bd ☆ om ⋮

IBM watsonx Upgrade ⓘ ⬄ Om Auti's Account ▾ Dallas ▾ OA ⋮

Projects / Vendox / Agent Lab Share feedback ⓘ Unsaved ⬇ New agent + Deploy ⚡

Build

AI Model: granite-3-3-8b-instruct ⌵ ⚙ <

Setup ▾

Configuration ▴

Framework Architecture

LangGraph ▾ ReAct ▾

Instructions [Advanced configuration](#)

You are a Street Vendor Digitalization Agent helps local hawkers and micro-entrepreneurs become digitally visible by generating business profiles, UPI setup guides, local SEO strategies, and customer engagement tips. It retrieves real-time policies, MSME schemes, geolocation of business data, digital onboarding steps, and consumer behavior insights from government portals.

Knowledge ▾

Tools ▾

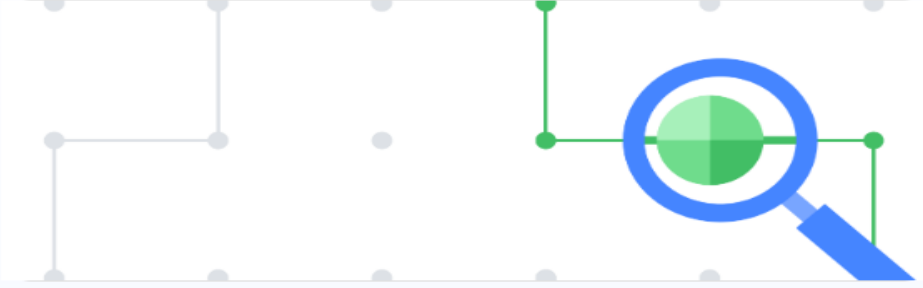
Add a tool Create custom tool

Agent preview

watsonx Agent 10:54 AM

Welcome to watsonx Agent

Change this description to reflect your particular agent



Type something... ⬇ ⬵

Windows Taskbar: Type here to search, SENSEX +0.14%, 10:54 AM 01-Aug-25

RESULT

The screenshot displays the IBM Watsonx Agent Lab web interface. The browser's address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents?context=wx&project_id=0a670d4e-93c1-4170-9ac7-8866778132bd`. The page header includes the IBM Watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user information for 'Om Anti's Account' in 'Dallas'. The main navigation bar shows 'Projects / Vendox / Agent Lab' and buttons for 'Share feedback', 'Unsaved', 'New agent +', and 'Deploy'. A modal dialog titled 'Select a tool' is open, prompting the user to 'Choose a tool to add to your agent.' It features a search bar and a grid of eight tools, each with an icon, a name, a description, and a toggle switch.

Tool	Description	Status
Google search	Retrieve information from the internet with the Google search engine.	Enabled
DuckDuckGo search	Retrieve information from the internet with the DuckDuckGo search engine.	Enabled
Wikipedia search	Retrieve information from Wikipedia articles.	Enabled
Document search	Search documents with vector indexes.	Disabled
Tavily search	Retrieve information from the internet with the Tavily search engine.	Disabled
Webcrawler	Retrieve information from a website.	Enabled
Python Interpreter	Execute Python code generated by the agent.	Disabled
Weather	Retrieve the weather of a city.	Enabled

RESULT

The screenshot displays the IBM watsonx Agent web interface. The browser address bar shows the URL: `datapatform.cloud.ibm.com/wx/agents/4f37d832-8f96-4635-bacf-63db5bca94c0?project_id=0a670d4e-93c1-4170-9ac7-8866778132bd&context=wx`. The interface is divided into two main panels: 'Build' on the left and 'Agent preview' on the right.

Build Panel:

- Model:** Set to 'granite-3-3-8b-instruct'.
- Framework:** Set to 'LangGraph'.
- Architecture:** Set to 'ReAct'.
- Instructions:** A text box contains the instruction: "You are a Street Vendor Digitalization Agent helps local hawkers and micro-entrepreneurs become digitally visible by generating business profiles, UPI setup guides, local SEO strategies, and customer engagement tips. It retrieves real-time policies, MSME schemes, geolocation of business data, digital onboarding steps, and consumer behavior insights from government portals." A link for 'Advanced configuration' is visible.
- Knowledge:** A section for adding knowledge base documents.
- Tools:** A section for adding custom tools.

Agent preview Panel:

- User Input:** "Give me MSME schemes for my fruits business."
- Agent Response:** "To find MSME (Micro, Small and Medium Enterprises) schemes for your fruits business, I will need to search through relevant government portals and fintech apps."
- Generated List:**
 - 1. Prime Minister's Employment Generation Programme (PMEGP):** This scheme aims to generate employment opportunities in the manufacturing and service sectors, including food processing, which could be beneficial for your fruits business.
 - 2. Credit Guarantee Scheme for Micro and Small Enterprises (CGMSME):** This scheme provides credit guarantee to banks for lending to micro and small enterprises, including those in the agricultural sector.
 - 3. Pradhan Mantri Kisan Sampada Yojana (PMKSY):** This flagship program of the Ministry of Food Processing Industries aims to create a conducive environment
- Input Field:** A text box at the bottom says "Type something..." with a send button.

The Windows taskbar at the bottom shows the time as 11:01 AM on 01-Aug-25, along with various system icons and a watchlist showing a -1.54% change.

RESULT

The screenshot shows a web browser window displaying the IBM Watsonx deployment interface. The browser's address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/spaces/645ff5a9-b0a9-4204-952b-27e2844dfd5c/deployments?context=wx`. The page header includes the IBM Watsonx logo, an 'Upgrade' button, and user account information for 'Om Auti's Account' in the 'Dallas' region. The main content area is titled 'Vendox' and has tabs for 'Overview', 'Assets', 'Deployments' (which is selected and highlighted with a blue border), 'Jobs', and 'Manage'. Below the tabs is a search bar and a table of deployments. The table has columns for Name, Type, Status, Asset, Asset type, Tags, and Last modified. A single deployment is listed: 'Vendox' (Type: Online, Status: Deployed with a green checkmark, Asset: watsonx Agent, Asset type: Ai service, Tags: wx-agent, Last modified: 18 seconds ago by Om Auti (You)). The bottom of the page shows a Windows taskbar with various application icons and a system tray displaying the time as 11:20 AM on 01-Aug-25 and the weather as 25°C Mostly cloudy.

IBM watsonx Upgrade ? Om Auti's Account Dallas OA

Deployment spaces /

Vendox

Overview Assets **Deployments** Jobs Manage

Search

Name	Type	Status	Asset	Asset type	Tags	Last modified
Vendox	Online	✓ Deployed	watsonx Agent	Ai service	wx-agent	18 seconds ago Om Auti (You)

Items per page: 20 1-1 of 1 items 1 of 1 pages


RESULT

The screenshot displays a web browser window with three tabs: 'Vendox — Vendox | IBM watsonx', 'Settings | IBM watsonx', and 'Home | IBM watsonx'. The address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/7dad4e5c-caef-44f3-9631-6a047214fdf5/chat?space_id=645ff5a9-b0a9-4204-952b-27e2844dfd5c&context=wx&flush...`. The IBM Watsonx header includes an 'Upgrade' button, a help icon, a notification bell, and user information for 'Om Auti's Account' in 'Dallas'. The breadcrumb trail is 'Deployment spaces / Vendox / watsonx Agent /'. Below this, the 'Vendox' deployment is shown as 'Deployed' and 'Online'. Three tabs are available: 'API reference', 'Test', and 'Preview' (which is selected). A 'New chat +' button is in the top right. The chat area shows a message from 'Vendox 11:37 AM' with the text 'Welcome to Vendox' and 'Your Personalized Digital Agent.' Below the message is a diagram of a neural network with a magnifying glass icon. At the bottom is a text input field with the placeholder 'Type something...'. The Windows taskbar at the very bottom shows the search bar, several application icons, and system status information: '26°C Partly sunny', '11:37 AM', and '01-Aug-25'.


RESULT

Vendox ✓ Deployed Online

[API reference](#) [Test](#) [Preview](#)

 You 02:20 PM

i want to generate my qr code for business

 Vendox 02:20 PM

To generate a QR code for your business, you can follow these steps:

- 1. Choose a QR code generator:** There are many free and paid QR code generators available online such as QR Code Generator, QRStuff, and Kaywa.
- 2. Select the type of QR code:** For a business, you would typically want a URL QR code if you're directing customers to a website or a payments QR code if you're accepting payments.
- 3. Enter the required data:** If you're creating a URL QR code, enter the URL of your business website or a specific landing page. For a payments QR code, you'll need to input your UPI ID or other payment details.
- 4. Customize your QR code:** Most generators allow you to customize the design of your QR code with colors and logos. This can help in brand recognition.
- 5. Download and test your QR code:** Once you're satisfied with your QR code, download it in a high-resolution format. Test it to ensure it directs to the correct URL or accepts payments correctly.
- 6. Print and display:** Print the QR code and display it at your stall or on your products.

For a more tailored guide, I would need to know if you're using a specific QR code generator or if you need help with integrating it with your online business platform.

Type something...

CONCLUSION

- The **Street Vendor Digitalization Agent** successfully bridges the digital gap for informal micro-entrepreneurs by leveraging the power of **Retrieval-Augmented Generation (RAG)**. It provides personalized, real-time guidance on business visibility, UPI setup, local SEO, and government schemes through a user-friendly, multilingual interface.
- By integrating voice-based interaction, geolocation-aware insights, and real-time policy retrieval, the system empowers vendors to access digital tools previously out of reach. The mobile-first, lightweight design ensures accessibility even on low-end devices.
- This project not only demonstrates the technical feasibility of RAG in grassroots applications but also highlights its social impact—enabling street vendors to thrive in the evolving digital economy.

FUTURE SCOPE

- The Street Vendor Digitalization Agent can be improved in many ways. In the future, vendors could upload photos to create digital posters or product catalogs. The system can give better suggestions by learning from user habits, seasons, and local trends. It can also support more languages and work in different cities and villages across India.
- Connecting with platforms like ONDC, WhatsApp, and delivery apps will help vendors sell products online easily. Adding simple training modules can teach vendors how to use digital tools and apps. Finally, linking with finance platforms can help them build credit scores and get small loans or insurance to grow their business.

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IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Om Auti

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 18, 2025
Issued by: IBM SkillsBuild

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