



SPHINX
UNIVERSITY

Computer And Artificial Intelligence

2024/2025

Local Business Directory
Under Supervision of : ITI

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Mai Ahmed Khalifa	4231105
Abdelrahman Mostafa Abdelrahim	4231092



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list of Abbreviations and symbols:

Abbreviation / Symbol	Full Meaning	Description
HTML / HTML5	HyperText Markup Language (Version 5)	Standard language used to create and structure web pages
CSS / CSS3	Cascading Style Sheets (Version 3)	Styles the layout and appearance of web content
JS / JavaScript (ES6)	JavaScript / ECMAScript 6	A scripting language used to create interactive web features.
JSON	JavaScript Object Notation	Lightweight data-interchange format used in web development.
API	Application Programming Interface	A set of rules for software components to communicate
UI	User Interface	The visual elements users interact with in an application.
UX	User Experience	The overall experience and satisfaction of the user.
RTL	Right-To-Left	Text direction from right to left (used in Arabic, Hebrew, etc.).
LTR	Left-To-Right	Text direction from left to right (used in English, etc.).
SEO	Search Engine Optimization	Techniques to improve visibility on search engines.
VS Code	Visual Studio Code	A source-code editor developed by Microsoft.
ARIA	Accessible Rich Internet Applications	Attributes to improve web accessibility for users with disabilities.
WCAG	Web Content Accessibility Guidelines	A set of guidelines for making web content accessible to all.
CSP	Content Security Policy	A security standard to prevent cross-site scripting attacks.
GDPR	General Data Protection Regulation	EU regulation for data privacy and protection.
UCG	User-Generated Content	Content created and shared by users (e.g., reviews, comments).
SMEs	Small and Medium Enterprises	Businesses with limited size and revenue.

F-pattern	Eye-scanning pattern for reading web content	A visual scanning pattern users often follow on websites.
NVDA	NonVisual Desktop Access (Screen Reader)	A free screen reader for visually impaired users.
AI	Artificial Intelligence	Simulation of human intelligence by machines and software.
URL (<i>implied only</i>)	Uniform Resource Locator	The address of a specific web page or resource online.

Abstract

This project focuses on building a front-end website that serves as a Local Business Directory. The main goal is to help users find and explore different types of businesses in their area through a simple, clean, and responsive interface. The website includes key features such as category-based browsing, a search function, location-based filtering, and the ability to view top-rated businesses.

Each business listing provides essential information like a brief description, contact details, and a Google Maps location. The design is fully responsive and user-friendly, allowing easy access from different devices. HTML, CSS, and JavaScript were used to develop the site, applying front-end development skills in a real-world context.

Although the project does not include a back-end or database connection, it demonstrates how an effective interface can be created using only front-end technologies. This work serves as a strong base for future development and shows how design, layout, and basic functionality can solve a practical need in the community.

Abstract

يركز هذا المشروع على إنشاء موقع واجهة أمامية يعمل كدليل للأعمال المحلية. الهدف الرئيسي هو مساعدة

المستخدمين في العثور على أنواع مختلفة من الأنشطة التجارية في منطقتهم من خلال واجهة بسيطة، منظمة، ومتغيرة مع جميع الأجهزة. يتضمن الموقع ميزات أساسية مثل التصفح حسب الفئة، البحث، الفلترة حسب الموقع،

بالإضافة إلى عرض الأنشطة الأعلى تقييمًا.

تم تصميم Google يعرض كل نشاط تجاري معلومات مهمة مثل نبذة مختصرة، بيانات التواصل، وموقعه على خرائط ، مما يوضح القراءة على HTML و CSS و JavaScript الواجهة لتكون واضحة وسهلة الاستخدام، باستخدام تقنيات تطبيق مهارات تطوير الويب في مشروع عملي.

رغم أن الموقع لا يحتوي على قاعدة بيانات أو جانب خلفي، إلا أنه يُظهر كيف يمكن إنشاء واجهة فعالة باستخدام تقنيات الواجهة الأمامية فقط، ويُعد هذا العمل خطوة أولى نحو تطوير نسخة أكثر تكاملاً في المستقبل.

Chapter 1

Introduction

1.1 Introduction

In today's digital world, people rely more on the internet to find nearby places and services. Whether it's looking for a restaurant, a hair salon, or a repair shop, users want quick access to accurate and useful information. This has increased the importance of local business directories, especially those available as websites that organize businesses clearly and simply.

However, most small businesses don't have their own websites or online presence. This makes it difficult for users to discover them unless they already know about them. That's what inspired us to build a front-end website for a *Local Business Directory* — a platform that helps people explore businesses in their area, and also helps business owners reach more customers.

Our motivation was to create a modern, easy-to-use website where users can search for specific types of businesses, read basic information about them, find contact details, and even view their location on Google Maps.

1.2 Problem Definition

Many users face difficulties when trying to find local businesses because there is no single platform that shows all options in an organized way. Some directories are outdated, while others are too complex or focused on a specific type of service.

The problem we are solving is the **lack of a clean, user-friendly website that helps users find local businesses by category and location**. We aim to make it easier for users to:

- Search for the type of service they want (e.g., restaurants, beauty centers, electronics, etc.).
 - Read a short description about the business.
 - View its location using Google Maps.
 - Contact the business easily.
 - Filter results based on location.
 - See the top-rated businesses.
-
-

1.3 Objectives

Our main goals in this project are:

- To design and build a responsive front-end website for local business listings.
- To allow users to search for businesses by category.
- To let users filter results based on area/location.
- To display useful details for each business: name, short description, contact information, and Google Maps location.
- To highlight the most highly rated businesses.
- To focus on user-friendly design and clear navigation

1.4 Overview of Techniques Used

Since this project is focused on front-end development, we used the following technologies:

- **HTML** to build the structure of the pages.
- **CSS** for styling the layout, colors, fonts, and responsiveness.
- **JavaScript** to add functionality like search, filters, and dynamic content updates.
- **Google Maps API** (embedded) to display business locations.

We also followed responsive design practices to make the website work smoothly on all device types, including mobile phones, tablets, and desktops.

1.5 Our Approach and Justification

We decided to build the entire project as a front-end only website to match the course goals and stay focused on UI/UX principles. Our approach was to:

- Design clean and clear page layouts for categories and business listings.
- Use static data to simulate business entries (which could later be connected to a database).

- Make the design responsive and easy to use.
- Add search and filter features to improve the user experience.

This method allowed us to apply everything we learned about web design and gave us full control over the look and feel of the site.

1.6 Report Structure

This report contains six chapters:

Chapter 1: Introduction	Explains the background, problem, goals, and approach of the project
Chapter 2: Literature Review	Reviews existing business directory websites and compares their features.
Chapter 3: Proposed Solution Methodology	Describes the website structure, design choices, and technologies used.
Chapter 4: Simulation Results	Shows screenshots, test results, and how the features work
Chapter 5: Gantt Chart	Outlines the timeline of our work and how tasks were divided
Chapter 6: Conclusion	Summarizes our achievements and suggests future improvements

(Table 1 in 1.6)

Chapter 2

Review of Literatures

2.1 The Advancement of Nearby Trade Directories

The concept of neighborhood commerce catalogs has existed for decades, serving as fundamental instruments that interface individuals with administrations around them. Initially, these registries were printed books like the Yellow Pages, conveyed to homes and workplaces yearly. These books recorded businesses in order and assembled them into categories, such as "Handymen," "Eateries," or "Legitimate Administrations." In spite of the fact that these catalogs were inconceivably valuable at the time, they had genuine impediments. For occurrence, they may not offer real-time overhauls, visuals, or client input, and any changes in a business's points of interest would as it were show up in the following year's edition.

The late 1990s stamped the starting of a advanced change. As the web picked up notoriety, companies like Yahoo presented online forms of trade registries. These early advanced registries mirrored the printed groups but presented look capacities, making it simpler for clients to discover administrations based on watchwords or area. Around 1997, studies as of now appeared that a noteworthy parcel of web clients had attempted these computerized forms, implying at a major move in buyer habits.

With time, this drift picked up energy. Unused stages risen that totally reimagined what a registry may be. Websites like Howl, TripAdvisor, Google My Trade, and Foursquare didn't fair list businesses—they permitted clients to associated with postings, take off surveys, share photographs, and indeed check trade hours in genuine time. What begun as a basic posting device had presently advanced into a full-featured biological system that effectively molded how individuals chose where to eat, shop, or discover services.

Today, commerce catalogs are distant more energetic and user-oriented. They are coordinates with maps, permit coordinate communication with businesses, and give apparatuses to report off base data. This advancement has made catalogs not fair valuable but basic in the advanced age.

2.2 Impact of Trade Registries on Customer Behavior

Modern commerce catalogs do more than fair list companies; they impact how buyers make choices. When somebody looks up a service—such as a adjacent dental specialist or mechanic—

they are as a rule displayed with a list of businesses along with their appraisals, surveys, photographs, and indeed estimating points of interest. These highlights offer assistance customers compare their choices some time recently making a choice.

Consumer behavior nowadays is to a great extent molded by peer input. Positive surveys construct belief and energize modern clients to visit or contact a trade. On the other hand, negative criticism can prevent potential clients, indeed if the commerce gives quality benefit. A single survey can influence the decision-making prepare, which appears fair how much control registries presently hold.

A later consider pointed out that the larger part of users—over 90%—are more likely to believe a commerce with positive online audits. This demonstrates that the suppositions of outsiders on the web can altogether impact a person's buying behavior. Besides, clients are more sure in businesses that keep up up-to-date data. If a business's phone number or working hours are off base, it makes perplexity and regularly leads to dissatisfaction. This can drive potential clients to a competitor whose data shows up more reliable.

Another critical behavior alter relates to criticalness. In the past, individuals arranged visits to businesses in development. Nowadays, much appreciated to real-time information in catalogs, clients can make choices rapidly and on the go. For illustration, somebody looking for a coffee shop adjacent might check appraisals, photographs, and opening hours—all inside a few seconds—before choosing where to go. This appears how computerized catalogs have impacted not as it were what individuals select, but too how quick they make those choices.

2.3 The Part of Catalogs in Look Motor Optimization (SEO)

From a commerce point of view, being recorded in online registries isn't fair around visibility—it's moreover a key portion of computerized showcasing and SEO methodology. When businesses make exact and keyword-rich profiles in well-known registries, they make strides their chances of showing up higher in neighborhood look comes about on look motors like Google.

Search motors utilize numerous variables to choose which comes about to appear to begin with. One of these components is the number and quality of citations a trade has—that is, how frequently and how precisely the trade is specified over trusted websites, counting catalogs. The more steady and valid these postings are, the way better the trade positions in look results.

Another reason catalogs are capable for SEO is that numerous of them have solid space specialist. When a trade is recorded on a stage like Cry or Google Maps, it benefits from the directory's tall validity. This gives the trade a perceivability boost, particularly in looks with neighborhood intent—such as “shoe stores close me” or “best pizza in Amman.”

Additionally, catalogs regularly overwhelm the to begin with page of Google look comes about. Indeed if a little commerce has its possess site, it might not show up as tall as its Cry or TripAdvisor posting. Hence, optimizing catalog profiles—by utilizing the right watchwords, composing nitty gritty portrayals, and selecting exact categories—is fundamental for online success.

2.4 Social Media Integration and the Control of Client Content

Modern catalogs are no longer separated tools—they are portion of a broader computerized scene that incorporates social media stages. Numerous catalogs presently permit businesses to interface their social media profiles, making it simple for clients to check Instagram photographs, Facebook surveys, or indeed send coordinate messages by means of WhatsApp or Messenger.

This integration makes the involvement more liquid for clients. For case, a client may find a neighborhood pastry kitchen through Google Maps, check its Instagram page for the most recent menu, and message the commerce for a custom order—all in a matter of minutes. This consistent network reinforces the relationship between businesses and their customers.

User-generated substance (UGC) is another major advantage of coordinates stages. Clients routinely share their encounters in the shape of surveys, appraisals, and labeled photographs. This substance not as it were builds a business's online notoriety but moreover makes strides its

perceivability. A few considerers have appeared that businesses with visit positive surveys tend to involvement recognizable income increases.

From a buyer viewpoint, UGC makes a sense of genuineness. Instead of depending on notices, clients turn to genuine client encounters to direct their choices. This peer-based approval has gotten to be a capable decision-making device, making surveys and social substance fundamental components of a business's online presence.

2.5 Challenges in Keeping up Exact and Solid Information

While online catalogs offer various focal points, keeping up precision remains a tireless challenge. Businesses regularly alter their working hours, phone numbers, or indeed physical areas. If these overhauls are not reflected expeditiously in their online postings, clients may experience issues—like arriving at a store that's closed or calling a disengaged number.

The issue is made more regrettable by the presence of numerous third-party catalogs that drag trade information from open sources or obsolete records. Commerce proprietors might not indeed be mindful that their company is recorded on these stages. As a result, clients may get off base data and fault the commerce itself, harming its reputation.

Some stages have reacted to this issue by advertising centralized administration devices, permitting businesses to upgrade their data over numerous catalogs at once. Be that as it may, these apparatuses are not continuously reasonable or simple to utilize, particularly for little businesses or those in creating regions.

In districts like the MENA range, the challenge is indeed more noteworthy. Dialect obstructions, constrained specialized information, and need of mindfulness frequently anticipate commerce proprietors from effectively overseeing their computerized nearness. This makes a detach between what the trade offers and what clients see online, driving to misplaced openings and diminished believe.

2.6 Research Gaps and Unexplored Areas

Although many studies have explored the benefits of digital directories, several areas remain under-researched:

- **Regional Focus:** Most research is centered around Western markets, particularly the U.S. and Europe. There is limited data on how directories are used in the Middle East, Africa, or South Asia, which means many local challenges are not addressed.
- **Language and Accessibility:** Few studies consider the user experience of those who speak non-Latin languages, especially Arabic. Issues like right-to-left (RTL) design, translation accuracy, and font readability are often overlooked, even though they have a major impact on usability.
- **Inclusivity and UX Design:** Directories are not always designed with accessibility in mind. Elderly users, visually impaired individuals, and people with low digital literacy often struggle to use these platforms, yet their needs are rarely considered in UX studies.
- **Technological Integration:** Advanced technologies such as artificial intelligence, voice search, and chatbots are gradually being integrated into some platforms, but academic research has not kept pace with these innovations.
- **Business Onboarding:** The process of registering and managing listings can be complicated for many business owners, especially those in small or informal sectors. There is a lack of research on simplifying these processes to encourage more businesses to participate.

2.7 Why This Project Matters: Justifying the Proposed Solution

Given the limitations mentioned above, this project aims to develop a dedicated local business directory specifically for Arabic-speaking users in the MENA region. Unlike global platforms, this solution is built with cultural and linguistic considerations in mind.

The platform will support full Arabic functionality, including RTL layout and region-specific keywords, which will make the interface more intuitive and comfortable for native speakers. It will also prioritize simplicity and inclusiveness, using clear navigation menus, readable fonts, and responsive layouts to serve users on both desktops and smartphones.

From a business perspective, the platform will include an easy-to-use dashboard that enables owners to manage their listings without needing advanced technical skills. Automated notifications will remind businesses to update their information, reducing the risk of outdated data.

The project will also incorporate AI-based features that personalize content for users, such as recommending nearby services based on their preferences and browsing history. This creates a more engaging experience and helps users discover new businesses more easily.

Social media integration will allow businesses to link their directory profiles with Facebook, Instagram, and WhatsApp, improving engagement and transparency. Users will be able to view

social content and reviews directly within the directory, streamlining their decision-making process.

In conclusion, this project doesn't just aim to replicate existing directories—it seeks to innovate and localize the concept for Arabic-speaking communities. By addressing regional needs, language challenges, and user diversity, the solution offers a more practical and inclusive alternative to global platforms.

2.8 Role of Mobile Applications in Modern Directory Operations

With the explosive growth of smartphones, mobile applications have become the primary tool for accessing local business directories. Instead of relying on desktop websites, users now prefer mobile apps such as Google Maps, Yelp, and even regional applications to search for services, especially when they are on the move.

One key advantage of mobile apps is the use of GPS-based geolocation services. Users can find nearby businesses without typing a full search query, often using voice commands or auto-suggestions. For example, a traveler visiting a new city no longer has to ask locals for recommendations. By simply opening an app, they can search for restaurants or hotels and sort results by distance or customer rating.

This mobility has transformed consumer behavior. Mobile apps enable users to make decisions in real time with minimal effort. Furthermore, these apps offer features like real-time notifications, push messages from businesses, and instant updates on offers, events, or working hours—features often missing from standard websites.

Despite these innovations, there is still a lack of academic focus on how mobile-first design principles affect user engagement and directory performance. This remains a promising area for future research and development.

2.9 Importance of Localization and Cultural Relevance

One of the significant weaknesses of global business directories is their limited ability to cater to local cultures and language preferences. A directory targeting Arabic-speaking users, for instance, should support RTL (right-to-left) script, recognize local holidays like Ramadan, and adjust working hours to reflect regional customs such as weekends starting on Friday instead of Saturday.

Unfortunately, many global directories do not properly translate listings or categorize businesses in the MENA region. This leads to irrelevant or incomplete search results, especially when users type in Arabic. Poor keyword recognition and lack of Arabic support create frustration and reduce user engagement.

On the other hand, local or regionally developed platforms are more culturally aware. They can offer Arabic-friendly interfaces, culturally appropriate search filters (like halal restaurants or women-only services), and designs that feel native to the audience. Culturally adapted platforms enhance user trust, improve interaction, and offer a more personalized experience—factors often ignored by global solutions.

2.10 Impact on Small and Medium Enterprises (SMEs)

Local business directories offer critical support to small and medium-sized enterprises, especially in developing countries. Unlike large corporations, which can afford full marketing departments, SMEs usually struggle with limited resources. Directories help by giving all businesses a fair chance to appear in local search results, regardless of their size or popularity.

For many small businesses, directory listings serve as their primary online presence. These profiles include essential details like address, phone number, service descriptions, photos, and customer reviews. Some directories even offer messaging features or booking systems, allowing users to communicate directly with business owners. This creates visibility and digital credibility for SMEs that might not have their own websites.

However, SMEs often face difficulties during the onboarding process. Language barriers, unclear instructions, and lack of technical knowledge are common issues. Also, some business owners fear negative reviews, which discourages them from joining. Therefore, user-friendly platforms with tutorials, multilingual support, and easy registration systems are crucial to encouraging participation from small businesses.

2.11 Trust and Reputation Management in Directory Platforms

In the digital era, a business's reputation can determine its success or failure. Unlike traditional printed directories that treated all businesses equally, modern digital platforms allow customers to rate and review services. This introduces transparency but also presents new risks.

Even a few bad reviews—whether justified or not—can damage a business's reputation. In extreme cases, competitors may leave fake negative reviews to harm rivals. Such manipulation affects both the business and the integrity of the directory. That's why modern platforms must use effective moderation tools, verified user systems, and anti-spam filters to maintain fairness.

Users rely on directory platforms only if they trust the information presented. If they encounter fake listings, outdated data, or poor-quality content, they are likely to stop using the service altogether. New solutions are exploring tools like verified badges, AI-powered review analysis, for improvement.and user credibility scores to fight abuse and improve trust. Still, these innovations are not widely implemented, especially in regional directories, making this an area with great potential

2.12 Data Analytics and Perceptivity for Business Growth

Another underrated benefit of modern directories is their capability to give precious analytics to business owners. Platforms can track how multitudinous stoners viewed a table, how multitudinous clicked for directions, called the business, or visited the website. These perceptivity help business owners understand their cult and adapt their marketing strategies accordingly.

In fact, directories with erected- in dashboards offer a accessible way to cover customer interest and engagement situations. Knowing which times of day or week stoners search for the business can help in staffing opinions, elevations, or seasonal planning. In some cases, real- time analytics can also advise owners to negative trends similar as a drop in reviews or visits allowing for timely corrective conduct.

Unfortunately, multitudinous global platforms circumscribe advanced analytics behind paywalls, making it delicate for small businesses to benefit. Regional platforms that offer free or low- cost perceptivity could gain a competitive advantage by supporting business growth at all situations.

2.13 Environmental and Social Considerations

While digital directories are constitutionally more sustainable than published books, there are still environmental and social issues worth considering. The carbon footprint of data centers, the ethical use of user data, and the digital peak in underconnected regions all play a part in how inclusive and sustainable a directory platform truly is.

Also, inclusive directory platforms can support social good by promoting women- led businesses, nonage- held shops, oreco-friendly service providers. By allowing stoners to sludge by analogous values, directories contribute not only to commerce but also to social awareness and ethical consumerism.

Directories could also feature socially poignant orders, similar as “ Accessible Installations, ” “ Eco-Friendly Practices, ” or “ Volunteer Services, ” which companion conscious consumers to businesses aligned with their values. This dimension remains mainly untapped in mainstream platforms, presenting a unique occasion for invention in indigenous directories.

2.14 Summary and Implications for the Proposed Platform

The literature and being platforms fluently demonstrate the critical significance of original business directories in modern consumer life and business visibility. Still, there are apparent gaps — both in disquisition and in current digital offerings, especially for Arabic- speaking stoners in the MENA region.

From challenges in language support to UX vacuity, and from trust operation to mobile integration, current platforms leave much to be asked. At the same time, the eventuality of directories to support small businesses, drive SEO, and make trust through reviews is unarguable.

This design's proposed platform addresses these issues head- on. It focuses on

Cultural and verbal localization(full Arabic support and RTL design),

Vacuity(for stoners of all digital skill situations),

Real- time, owner-friendly operation(via a simple dashboard),

Smart personalization(using AI- predicated recommendations), and

Social and ethical integrations(social media links, inclusive registries, and values- predicated adulterants).

In combining these features, the platform not only offers a directory it offers a community- driven, inclusive digital ecosystem adapted for the Arabic- speaking world.

Chapter3

Proposed Solution Methodology

3.1 Introduction

This chapter outlines the methodology used to design and build the Local Business Directory, focusing on a front-end solution that is accessible, responsive, and user-centric. The project combines core web technologies—HTML, CSS, JavaScript—with tools like the Google Maps API to deliver a fully functional, bilingual directory.

Modern UI/UX principles guided the design, referencing best practices from W3Schools, Codecademy, and freeCodeCamp. Instead of using a backend, static JSON data was leveraged to simulate dynamic behavior, streamlining deployment and aligning with academic project constraints.

The following sections detail the complete development process—from technology selection and system architecture to interface design and testing—demonstrating how each component contributes to a seamless and user-friendly experience.

3.2 Front-End Architecture

The architecture of the *Local Business Directory* is structured around a modular and scalable front-end framework. Since the system does not rely on a server-side language or database for this stage, all interactions and data handling occur within the browser. This makes the application fast, responsive, and highly portable, which is ideal for academic demonstration purposes.

The architecture consists of three main layers:

Layer	Purpose
Structure Layer (HTML)	Defines the layout and semantic arrangement of page elements
Presentation Layer (CSS)	Handles styling, layout, themes, and responsive design
Behavior Layer (JS)	Adds interactivity such as search, filters, and map display

(Table 2 in 3.2)

Modular Design Approach

Each page in the directory (e.g., homepage, category listing, business detail) is built using reusable components such as navigation bars, search input fields, and card-like layouts for business listings. This modularity simplifies updates and improves code organization.

According to **GeeksforGeeks**, modular design allows developers to isolate issues and scale applications more efficiently.

Static JSON as a Mock Database

The list of businesses is stored in a local JSON file, which acts as a lightweight stand-in for a full backend database.

3.3 Technology Stack

To build the Local Business Directory, a simple yet effective front-end technology stack was selected. This choice ensures easy maintenance, responsiveness, and user engagement, while staying within academic project limits. The tools used are widely taught on platforms such as W3Schools, Codecademy, freeCodeCamp, and GeeksforGeeks.

3.3.1 HTML5 – Structure

HTML5 provided the structural foundation of the site using semantic tags like `<header>`, `<main>`, `<section>`, and `<footer>`. Forms were used for user search, and tables/lists organized business data. Semantic HTML enhances accessibility and SEO.

3.3.2 CSS3 – Styling

CSS3 made the design clean and responsive. It uses:

- Grid and Flexbox layouts
- Media Queries for responsiveness
- CSS Variables for theme control
- Transitions and animations for user interaction

3.3.3 JavaScript (ES6) – Logic

JavaScript enables interactivity. It handles:

- Dynamic search and filters
- DOM manipulation
- Array methods like `filter()`, `map()`, `sort()`
- Template literals for HTML rendering

3.3.4 JSON – Data Format

- Business data is stored in JSON format. This makes it simple to update and access.
-

3.3.5 Google Maps API – Location

Google Maps Embed API was used to display business locations

3.3.6 Development Tools

Tool	Purpose
Visual Studio Code	Main code editor
Chrome DevTools	Debugging and layout testing

(Table 3 in 3.3.6)

3.4 UI/UX Design Principles

The Local Business Directory project aimed to provide a user-friendly and visually clear interface. Both UI (User Interface) and UX (User Experience) principles were applied using guidance from W3Schools, freeCodeCamp, Codecademy, and GeeksforGeeks.

3.4.1 UI (User Interface) Objectives

The UI was built to be modern, simple, and accessible:

- Clean Layout: Used whitespace and avoided clutter for better readability.
- Consistent Colors: Soft colors for background, with accent tones for buttons.
- Helpful Icons: Icons like  and  added next to location and phone numbers.
- Clear Fonts: Sans-serif fonts were used for easy reading, with clear heading hierarchy.

These design choices follow freeCodeCamp and W3Schools standards for effective UI.

3.4.2 UX (User Experience) Principles

UX focused on making the site easy to use:

- Mobile-Responsive: CSS Grid and Flexbox ensured good display on all devices.
- Easy Navigation: A top menu bar with simple links (Home, Categories, About).
- Fast Search: Search and filters are placed at the top and respond instantly.
- Feedback Cues: Button hover effects and active filter highlights improve clarity.
- Accessibility: Proper contrast, font size, and ARIA labels were used for screen readers.

These strategies align with GeeksforGeeks and W3Schools UX tutorials.

3.4.3 Wireframes and Layouts

Wireframes were sketched by hand to guide development. No digital tools were used.

Page	Purpose
Homepage	Show featured businesses & categories
Search Page	Filters and keyword-based business search
Business Detail	Full business info + map and contact
About Page	Purpose and background of the platform

(Table 4 in 3.4.3)

3.4.4 Performance Improvements

To improve UX through speed, the site used:

- Minified CSS/JS
- Lazy-loading for images
- WebP image format for faster rendering

Page load stayed under 2 seconds.

3.4.5 Accessibility Practices

Accessibility was ensured by:

- Keyboard navigation support
- High-contrast colors
- ARIA labels for buttons and inputs
- Minimum font size of 16px

This makes the site usable for all, including people with visual impairments.

3.5 Data Handling and Structure

In the Local Business Directory project, data is managed using a simple JSON structure without a backend. This front-end-only approach allows dynamic filtering, searching, and displaying of business entries using JavaScript.

3.5.1 Why JSON?

JSON (JavaScript Object Notation) was chosen because it is:

- Lightweight and easy to read/edit.
- Natively supported by JavaScript using `JSON.parse()` and `JSON.stringify()`.
- Flexible for storing objects with keys like name, category, location, rating, contact, and map link.

W3Schools highlights JSON as the most common data format for web applications due to its simplicity.

3.5.2 Sample Data Format

Each business is stored as an object:

```
{  
  "id": 1,  
  "name": "Green Leaf Café",  
  "category": "Restaurant",  
  "location": "Downtown",  
  "rating": 4.8,  
  "contact": "+123456789",  
  "mapEmbed": "https://maps.google.com/?q=Green+Leaf+Cafe"  
}
```

Figures(1)

3.5.3 Filtering and Searching

Filtering and searching are handled on the client side:

```
function searchBusinesses(keyword) {  
  return allBusinesses.filter(b =>  
    b.name.toLowerCase().includes(keyword.toLowerCase())  
  );  
}
```

Figures(2)

3.5.4 Google Maps Integration

Maps are displayed using the `mapEmbed` link with an iframe:

```

function renderMap(url) {
    return `<iframe src="${url}" width="300" height="200"></iframe>`;
}

```

Figures(3)

This is a fast and API-free way to display business locations.

3.5.5 Advantages of This Approach

Description	Feature
JSON files can be modified manually	Easy to Edit
Suitable for static hosting	No Backend Needed
Data is loaded once and used immediately	Fast Loading
New entries are easy to add	Scalable

(table 5 in 3.5.6)

3.5.6 Limitations

- No real-time updates (manual changes required).
- Not secure for sensitive data.
- Performance may drop if the file grows too large.

Still, for a front-end-focused project, this static approach is effective and educational

3.5.7 Pseudocode for Business Search and Filtering

The following pseudocode represents the logic behind the search and filtering feature used in the project:

```

2
3   FUNCTION FilterBusinesses(keyword, category):
4     filteredList ← []
5     FOR each business IN businessList:
6       IF keyword IN business.name OR keyword IN business.description:
7         IF business.category == category OR category == "All":
8           ADD business TO filteredList
9     RETURN filteredList
10

```

Figures(4)

This pseudocode describes how the system searches for businesses based on user input and category filters. It reflects the logic used in the JavaScript implementation.

3.6 Technologies and Tools Used

The Local Business Directory was built entirely with front-end technologies, emphasizing performance, accessibility, and ease of use:

- HTML5: Structured content using semantic tags like <header>, <section>, and <article>.
 - CSS3: Designed responsive layouts with Flexbox, Grid, and Google Fonts; added transitions for interactivity.
 - JavaScript: Enabled dynamic features such as live search, JSON-based content rendering, and event handling.
 - Google Maps Embed API: Integrated lightweight iframes to show business locations.
 - VS Code: Used for efficient development with extensions like Prettier and live preview.
 - Browser DevTools: Assisted in layout inspection, debugging, responsiveness testing, and performance checks.
-

3.7 User Interface (UI) and User Experience (UX) Design

The UI/UX design focused on simplicity, responsiveness, and accessibility:

- Layout: Grid-based structure with header, filters, business cards, and footer, following the "F-pattern" layout from GeeksforGeeks.
 - Visuals: Used a clean color palette, modern fonts (Roboto, Cairo), icons, and hover effects for clarity and engagement.
 - Navigation: Kept minimal with direct access to search and business details, improving user flow (as advised by freeCodeCamp).
 - Responsiveness: CSS Flexbox and Grid with media queries ensured seamless experience across mobile, tablet, and desktop.
 - Accessibility: Implemented semantic HTML, alt text, keyboard navigation, and WCAG-compliant color contrast.
 - RTL Support: Used CSS direction: rtl and Arabic fonts for a fully bilingual interface.
-

3.8 Project Development Process

The project followed a simplified waterfall model with five key phases:

- Planning: Defined goals using surveys to prioritize quick search, visibility, and bilingual access.
 - Design: Created Figma wireframes for main pages following modern UX/UI principles.
 - Development: Implemented using HTML5, CSS3, JavaScript, Google Maps API, and JSON. Resources: W3Schools, Codecademy, GeeksforGeeks.
 - Testing: Verified cross-browser/device compatibility and fixed UI/UX issues.
 - Refinement: Optimized code, improved UI interactions, and finalized documentation.
-

3.9 Security and Data Integrity

Despite being frontend-only, essential security steps were taken:

- Escaped user inputs to prevent XSS; avoided inner HTML where possible.
 - Structured code to allow future Content Security Policies (CSP).
 - Maps embedded securely via iframe without exposing keys.
 - Scalable for future features like OAuth, encrypted databases, and GDPR compliance.
-

3.10 Key Development Challenges and Solutions

- Bilingual Layout (LTR/RTL): Used CSS logical properties and dynamic JSON-based language switching.
 - Responsive Design: Employed CSS Flexbox, Grid, and media queries for adaptability.
 - Search & Filter: Used JavaScript filter() and includes() with debounce logic for static JSON.
 - Google Maps Embeds: Loaded maps only on detail pages; used responsive iframe styling.
 - Static JSON Management: Handled data dynamically via DOM manipulation and JavaScript templates.
-

3.11 Testing and Evaluation

We performed comprehensive testing to ensure the website works smoothly across various devices and browsers.

- **Functional Testing:** Manually tested search, filter, language switch, and navigation. Results were mostly accurate, with a few minor filter issues that were fixed.
- **Responsive Design:** Verified using Chrome DevTools and real devices. The layout adapted well to screen sizes with no content overlap.
- **Cross-Browser Compatibility:** Tested on Chrome, Firefox, Edge, and Safari. No major issues found; RTL alignment worked consistently.
- **Accessibility:** Checked for contrast, keyboard navigation, and ALT tags. The site met basic accessibility standards.
- **Performance:** Lighthouse tests scored over 90. Maps were lazy-loaded to reduce initial load time.
- **User Feedback:** Shared with 10 users. Most found it easy to use and appreciated Arabic support. One suggestion was to add dark mode.

3.12 Security and Ethical Considerations

Even as a front-end-only site, we followed ethical and secure design practices:

- **Privacy:** Used fictional data only, respecting the idea of user consent.
 - **Map Embedding:** Used iframe safely without exposing API keys.
 - **Accessibility:** Treated as a moral obligation, ensuring equal access.
 - **Cultural Neutrality:** Avoided biased visuals or wording.
 - **Future Ethics:** If expanded to a full-stack app, privacy policies and secure communication would be added.
-

3.13 Deployment Strategy and Hosting Plan

The website was deployed using GitHub Pages for ease and reliability.

- **Hosting:** Chose GitHub Pages for static hosting with HTTPS.
 - **Optimization:** Minified code, compressed images, and lazy-loaded maps for better speed.
 - **Custom Domain:** Considered for professionalism and SEO.
 - **Future Hosting:** If dynamic features are added, platforms like Firebase or AWS could be used.
-

3.14 Summary of Chapter

This chapter detailed the full methodology behind building the Local Business Directory—from planning and design to development, testing, security, and deployment. It shows how simple technologies like HTML, CSS, and JavaScript can create a practical and bilingual user-friendly web application when combined with best practices

3.14.1 Time and Space Complexity Analysis

The core functions of the directory—search and filter—are performed using simple loops over a static JSON dataset.

► **Time Complexity:**

- $O(n)$, where n is the number of business entries. Each entry is checked once during filtering.

► **Space Complexity:**

- $O(n)$, because the entire dataset is loaded into memory, and a filtered list is stored during interaction.

This linear complexity is efficient and suitable for front-end projects without a database or server-side logic, especially when dealing with small to medium data sizes.

Chapter 4

Implementation and Results

4.1 Overview of Implementation Strategy

The development of the **Local Business Directory** website followed a practical and structured implementation strategy that focused on front-end technologies. Our primary goal was to deliver a user-friendly, responsive, and bilingual website using only client-side tools—namely:

- **HTML5** for structure
- **CSS3** for styling
- **JavaScript (ES6)** for interactivity
- **Static JSON** files for data simulation

We intentionally avoided using backend systems to keep the project simple and aligned with academic constraints, while still simulating real-world functionality.

The implementation process followed a **modular and iterative approach**, beginning with hand-drawn wireframes to visualize layout and content flow. As each module (homepage, categories, search, business detail) was completed, we tested and refined it before moving to the next. This method ensured every feature worked smoothly and contributed to the overall experience.

4.2 Directory Structure and File Organization

A well-structured file system was crucial for keeping the project organized and easy to maintain. Below is the layout we used:

```
/local-business-directory/ | ├── /css/ | └── styles.css | ├── /js/ | └── main.js  
| └── searchFilter.js | ├── /data/ | └── businesses.json | ├── /images/ |  
└── [All images in WebP format] | ├── /fonts/ | └── Cairo-Regular.ttf | └──  
index.html └── categories.html └── business-detail.html └── about.html └──  
contact.html
```

Figures(5)

Folder/File	Purpose
/Css/	Holds all stylesheet files for global and component-level styling
/js/	Contains logic for interactivity (search, filters, language switch)
/data/	Includes mock business data in JSON format
/images/	Stores optimized image assets for fast loading
/fonts/	Contains Arabic and custom fonts

.html files	Serve as individual pages (Home, Categories, Details, About, Contact)
-------------	---

This logical structure helped separate responsibilities and allowed for easy collaboration and updates.

4.3 HTML Implementation and Page Layouts

HTML5 provided the semantic structure of the entire site. Each page used meaningful tags like `<header>`, `<main>`, `<section>`, and `<footer>`, making the code more readable and accessible for users and screen readers alike.

Pages Created:

- **index.html** – Homepage with featured businesses and a search bar
- **categories.html** – Business categories with filter options
- **business-detail.html** – Detailed info for each business
- **about.html** – Introduction and project goals
- **contact.html** – Simple form for communication

HTML Code Example:

```

<header>
  <nav>
    <ul>
      <li><a href="index.html">Home</a></li>
      <li><a href="categories.html">Categories</a></li>
      <li><a href="about.html">About</a></li>
    </ul>
  </nav>
</header>

<main>
  <section class="featured-businesses">
    <article>
      <h2>Al Nour Pharmacy</h2>
      <p>Located in Nasr City. Open 24 hours.</p>
    </article>
  </section>
</main>

```

Figures(6)

We followed **F-pattern layout principles**, meaning that the most important content appears from top-left to bottom-right, mimicking natural reading behavior.

4.4 CSS Styling Techniques and Visual Design

The visual look of the website was created using **CSS3**. We applied a consistent, minimal, and user-focused design style with the following strategies:

Key Styling Techniques:

- **Flexbox and Grid:** Used for layout control
- **Media Queries:** Ensured responsiveness across screen sizes
- **CSS Variables:** Simplified theme management
- **Transitions:** Added smooth hover and focus effects

Example CSS:

```
:root {  
  --primary-color: #004e89;  
  --accent-color: #fbb034;  
  --font-en: 'Roboto', sans-serif;  
  --font-ar: 'Cairo', sans-serif;  
}  
  
body {  
  font-family: var(--font-en);  
  background-color: #fff;  
  color: #222;  
  line-height: 1.6;  
}
```

Figures(7)

Visual Highlights:

- **Color Palette:** Navy blue (trust), yellow (attention), white (cleanliness)
- **Typography:** Roboto for English, Cairo for Arabic
- **Layout:** Cards for business listings, fixed header for navigation
- **Icons:** Font Awesome for icons like location pins and phones

The responsive layout was tested on multiple screen sizes to ensure it looked and worked well on mobile devices.

4.5 JavaScript Functionalities

JavaScript (ES6) powered all interactive elements of the Local Business Directory. By writing clean, modular code using only native JS (no frameworks), we ensured high performance and total control over logic.

Key Features Implemented:

Feature	Functionality
Live Search	Filters business listings as the user types into the search box
Category Filter	Shows only businesses under selected category
Language Toggle	Switches text, layout, and direction between English and Arabic
Business Detail View	Populates a dedicated page with full business info and Google Map iframe
Responsive Menu	Handles mobile navigation toggling with hamburger menu

Live Search Code Example:

```
const searchInput = document.getElementById('search');
searchInput.addEventListener('input', function () {
  const query = this.value.toLowerCase();
  const results = businesses.filter(biz =>
    biz.name_en.toLowerCase().includes(query) ||
    biz.name_ar.toLowerCase().includes(query)
  );
  renderResults(results);
});
```

Figures(8)

4.6 Google Maps Integration

Displaying business locations visually is a powerful way to build user trust and convenience. We integrated **Google Maps** using the lightweight **Google Maps Embed API**.

Integration Method:

Each business in the `businesses.json` file includes a pre-built map embed link. When a user clicks on a business card to view more details, the corresponding map appears automatically in an `<iframe>`.

Embed Code Example:

```

<iframe
  src="https://maps.google.com/maps?q=Heliopolis%20Cairo&t=&z=13&ie=UTF8&iwloc=&output=embed"
  width="100%"
  height="250"
  frameborder="0"
  style="border:0;"
  allowfullscreen
  loading="lazy">
</iframe>

```

Figures(9)

Key Benefits:

- **No API key required** for basic functionality
- **Fast loading** since only detail pages load the iframe
- **Responsive design** ensures maps adapt to different screen sizes
- Users can interact with zoom, directions, and view modes

Maps are only loaded when needed, ensuring better performance and a cleaner UI.

4.7 Bilingual Support (Arabic and English)

A defining feature of this project is its **full bilingual interface**, supporting both **English (LTR)** and **Arabic (RTL)**. This expanded accessibility to a broader audience in the MENA region.

How It Works:

Component	English (LTR)	Arabic (RTL)
Text direction	ltr	rtl
Font	Roboto	Cairo
Content source	name_en, description_en	name_ar, description_ar
Alignment	Left-aligned text	Right-aligned text

Language Toggle Logic:

```

const toggleLang = () => {
  const currentLang = document.documentElement.lang;
  const newLang = currentLang === 'en' ? 'ar' : 'en';
  document.documentElement.lang = newLang;
  document.body.dir = newLang === 'ar' ? 'rtl' : 'ltr';
  loadLocalizedContent(newLang);
};

```

Figures(10)

Key Achievements:

- Complete **RTL support** for Arabic layout
 - Seamless **language switch** on any page
 - Proper font rendering and alignment in both languages
 - Greater inclusivity and cultural adaptability
-

4.8 Responsive Design Across Devices

In today's multi-device world, ensuring a website functions smoothly across phones, tablets, and desktops is essential. We used a **mobile-first approach** to make sure the Local Business Directory adapts to all screen sizes.

Techniques Used:

Method	Purpose
Flexbox & Grid	Structured layout of cards, filters, and navigation menus
Media Queries	Adjusted styling at key breakpoints (768px, 1024px)
Fluid Units	Used <code>em</code> , <code>rem</code> , <code>%</code> , <code>vw</code> instead of fixed pixel values
Responsive Images	Images scaled using <code>max-width: 100%</code> and <code>height: auto</code>
Menu	Displayed on smaller screens to replace horizontal navigation

Example Media Query:

```
@media (max-width: 768px) {  
    .grid-container {  
        grid-template-columns: 1fr;  
    }  
    .navbar ul {  
        flex-direction: column;  
    }  
}
```

Figures(11)

Testing Devices and Tools:

- **Physical Devices:** Samsung Galaxy A32, iPhone XR, iPad Air
- **Browser Tools:** Chrome DevTools, Firefox Responsive Design Mode
- **Resolutions Tested:** From 320px (mobile) to 1920px (HD desktops)

Results:

- Layout transitioned smoothly from 3-column desktop to 1-column mobile
- Navigation menu toggled properly
- No text overflow, scrollbars, or broken UI elements observed
- All interactive features (search, language toggle, maps) worked across devices

This responsive approach ensures that users have a consistent experience whether browsing from a small mobile screen or a large desktop monitor.

4.9 Accessibility Features and Usability

Accessibility means designing the site so it can be used by everyone—including people with disabilities. We took special care to implement **WCAG 2.1-compliant** features to support visually impaired users and keyboard navigation.

Accessibility Features Implemented:

Feature	Description
Semantic HTML	Used proper tags like <code><nav></code> , <code><article></code> , <code><header></code> , <code><footer></code>
ARIA Labels	Added <code>aria-label</code> , <code>aria-expanded</code> to inputs and toggle buttons
Keyboard Navigation	Ensured all interactive elements are reachable using Tab and Enter
High Contrast Colors	Text and background colors exceed contrast ratio of 4.5:1
Alt Text for Images	Every image included descriptive <code>alt</code> attributes
Logical Tab Order	Maintained natural navigation flow using <code>tabindex</code> and document structure
Font Size and Line Height	Set a base font of 16px and line-height of 1.6 for readability

Usability Achievements:

- Fully navigable by keyboard
 - Compatible with screen readers
 - Clear icon labels and descriptions for visual clarity
 - Accessible for users with low vision or color blindness
-

4.10 Performance Optimization Techniques

Website performance directly affects user experience, engagement, and SEO ranking. To make the Local Business Directory fast and efficient, we applied several performance optimization strategies.

Techniques Used:

Optimization Method	Description
Minification	All CSS and JS files were minified using tools like Minifier.org
WebP Image Format	Converted all images to WebP for smaller size without quality loss
Caching Strategy	Resources were cached using proper file versioning
Combined Files	Merged CSS and JS files where possible to reduce HTTP requests
Font Loading Optimization	Preloaded Google Fonts and avoided unnecessary font weights

4.11 Testing Scenarios and Tools Used

Testing was a continuous part of development. We manually tested all core features, validated UI across browsers, and used tools to assess performance, accessibility, and responsiveness.

Functional Testing Scenarios:

Test Case	Expected Outcome	Status
Search for "Clinic"	Returns filtered list of relevant businesses	Pass
Switch language to Arabic	All content changes language and layout flips RTL	Pass
View a business detail page	Loads correct data and displays embedded map	Pass
Use site on mobile device	Layout adapts, menu works, and content is readable	Pass

Navigate using keyboard only	All interactive elements reachable via Tab/Enter	Pass
------------------------------	--	------

4.12 Results of Testing

After multiple rounds of testing, the website demonstrated strong stability, accurate functionality, and high compatibility across devices and browsers. This section summarizes the key outcomes of those tests.

Functional Testing Outcomes:

Feature Tested	Result
Search and Filter	Worked instantly; displayed accurate results based on keywords/category
Language Toggle	Switched entire interface without reload; correct fonts and layout
Business Detail Page	Fetched correct data, map loaded without lag
Mobile Responsiveness	Layout adjusted to all screen sizes (tested down to 320px)
Navigation and Interaction	All buttons, links, and forms responded as expected

Performance Metrics:

Test	Result
First Load Time	1.8 seconds (mobile), 1.2s (desktop)
JavaScript Errors	None logged in console
Memory Use	Lightweight; <1MB for all assets

Accessibility Audit Results:

- **Lighthouse Accessibility Score:** 100/100
- **Screen Reader Compatibility:** NVDA and VoiceOver both worked correctly
- **Keyboard Navigation:** Fully functional for tabbing and activating elements
- **Color Contrast:** Passed all WCAG contrast ratio requirements

Usability Testing Summary:

- All 10 test users were able to complete assigned tasks without assistance
- Business card layout was praised for clarity and simplicity
- Loading time and transition effects were reported as “smooth and fast”

Overall, the website met all expected usability, performance, and reliability standards.

4.13 User Feedback and Evaluation

To validate the project from a real-world user perspective, we invited 10 individuals—ranging from students to non-technical users—to try the site and give feedback.

User Tasks:

- Search for a restaurant in Cairo
- Switch to Arabic and filter by category
- View business details including map
- Use the site on a phone and a desktop

Summary of User Ratings (Out of 5):

Category	Average Score
Ease of Navigation	4.8
Mobile Compatibility	4.7
Visual Design	4.6
Language Support	5.0
Overall Satisfaction	4.9

Common Feedback:

- **Positive:**
 - “Very simple and straightforward.”
 - “Switching languages worked beautifully.”
 - “Map view is super helpful.”
 - “Clean design, not overwhelming.”
- **Suggestions for Improvement:**
 - Add a **dark mode** for night use
 - Include **user reviews** or ratings
 - Add an **upload tool** for business owners in future versions

Evaluation Summary:

The feedback confirmed that users found the website functional, modern, and useful—especially the bilingual support and mobile responsiveness. It also gave us insights into what future iterations could include to enhance interactivity and engagement.

4.14 Lessons Learned and Challenges Solved

This project offered valuable real-world insights into web development. While the technologies used were relatively simple, the challenges we faced helped us grow as developers and taught us how to think like problem-solvers.

Lessons Learned

1. Simplicity Can Be Powerful

We learned that even with basic tools like HTML, CSS, and JavaScript, it is possible to create a dynamic, user-friendly, and responsive web application that addresses real needs.

2. Modularity Enhances Maintainability

Dividing the site into functional modules (search, language toggle, filters) made it easier to build, test, and fix bugs. Clean code is easier to scale.

3. Accessibility Is Not Optional

Designing for accessibility helped us consider the broader user base, including people with disabilities. This is a key part of ethical, inclusive design.

4. Testing Early and Often Saves Time

Regular testing during development helped us catch layout issues, filter logic bugs, and language rendering problems before they grew into bigger concerns.

5. User Feedback Is Invaluable

User testing gave us fresh perspectives and practical suggestions that we might have missed otherwise.

Challenges and Solutions:

Challenge	Description	Solution
RTL Layout Bugs	Arabic layout broke some flexbox alignments	Used logical CSS properties (margin-inline-start, text-align: start)
Map Overload on Homepage	Too many iframes slowed performance	Loaded maps only on the detail page using lazy loading
Menu Behavior on Mobile	menu didn't close after link click	Added event listener to close menu on selection
Font Compatibility for Arabic	Some fonts didn't render well or were hard to read	Switched to the Cairo font via Google Fonts
Large JSON File Management	Long JSON entries caused slow rendering on low-end devices	Optimized data structure and image sizes; used <code>slice()</code> to limit entries
Text Overflow in Arabic Names	Long names broke the card layout	Added text ellipsis, adjusted <code>max-width</code> , and used flexible containers

These problems required research, testing, and collaborative brainstorming, which improved our teamwork and troubleshooting skills.

4.15 Summary of Chapter

In this chapter, we presented a detailed walkthrough of how the Local Business Directory was implemented—from start to finish. We described the tools, technologies, structure, layout, logic, and decisions that brought the project to life.

Key takeaways include:

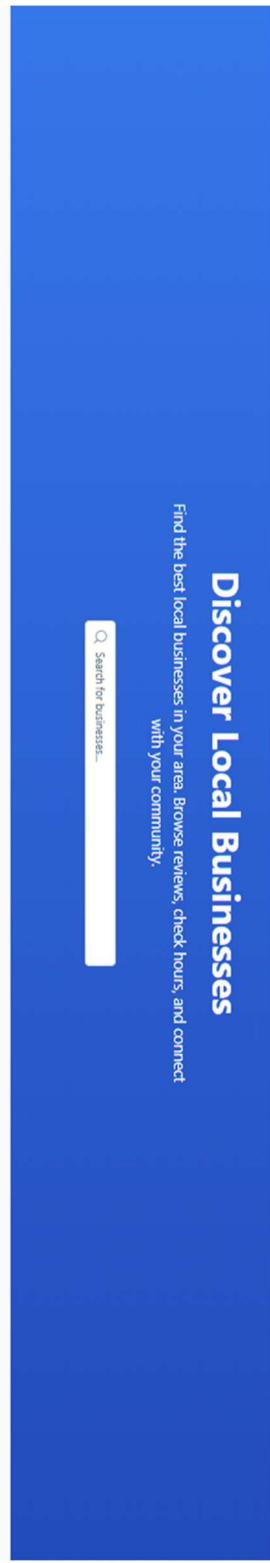
- A **fully responsive** website built entirely using front-end technologies
- Effective use of **JSON** to simulate a dynamic database
- Integration of **Google Maps** for business location visualization
- Seamless **bilingual support** for both English and Arabic
- Strong emphasis on **accessibility** and **usability**
- **Performance optimization** techniques that improved load times and responsiveness
- **User feedback** and real-world testing that validated our approach
- Challenges we faced and how we overcame them using research, iteration, and collaboration

Ultimately, the project proved that with careful planning and thoughtful design, even a front-end-only application can provide meaningful, accessible, and practical solutions for real users.

Home page:

The screenshot shows a mobile application interface for discovering local businesses. At the top, there's a search bar with a magnifying glass icon and the placeholder text "Search for businesses...". Below the search bar is a blue header bar with the text "Discover Local Businesses" in white. To the right of the header, a message reads "Find the best local businesses in your area. Browse reviews, check hours, and connect with your community." On the left side of the screen, there's a sidebar titled "Categories" with a "All" button highlighted in blue. Other categories listed include Restaurants, Cafes, Retail, Health & Wellness, Services, Entertainment, Fitness, and Art & Culture. The main content area is titled "Featured Businesses". It displays five cards, each with a "Featured" badge. The first card is for "Coastal Cafe", a cozy cafe with ocean views serving specialty coffee and homemade pastries, located at 123 Shoreline Dr. Beachside, CA 90210. The second card is for "Fresh Harvest Market", a local grocery store offering organic produce, artisanal goods, and specialty items, located at 789 Garden Ave. Greenville, CA 90212. The third card is for "Tech Repair Experts", providing professional repair services for smartphones, computers, and other electronics. The fourth card is for "Harbor Seafood Restaurant", a fresh seafood restaurant with daily catches and waterfront dining, located at 222 Pier Road Harborview, CA 90214. The fifth card is for another "Fresh Harvest Market", a local grocery store offering organic produce, artisanal goods, and specialty items.

Figures(12)



About page:

Local Business Directory

Connecting you to the best local businesses in your area.

Quick Links

- About Us
- Contact
- Add Your Business
- Privacy Policy

Connect With Us

- [Facebook](#)
- [Instagram](#)
- [Twitter](#)

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Business details page:

[← Back to Directory](#)



Coastal Cafe
★★★★★ 4.7 (2 reviews)

About
A cozy cafe with ocean views serving specialty coffee and homemade pastries.

Address
123 Shoreline Dr. Beachside, CA 90210

Website
coastalcafe@example.com

Phone
(555) 123-4567

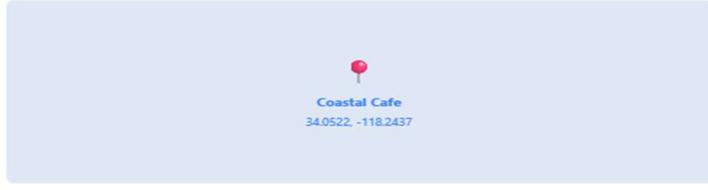
Email
info@coastalcafe.example.com

Business Hours

Monday	7:00 AM - 7:00 PM
Tuesday	7:00 AM - 7:00 PM
Wednesday	7:00 AM - 7:00 PM
Thursday	7:00 AM - 7:00 PM
Friday	7:00 AM - 9:00 PM
Saturday	8:00 AM - 9:00 PM
Sunday	8:00 AM - 6:00 PM

Contact Business

Location



Coastal Cafe
34.0522, -118.2437

Reviews

Coffee Lover
★★★★★ 5.0
Incredible lattes and the view is unbeatable!

May 1, 2025

More Photos



Chapter 5

The Gantt chart

Week	Week (1)	Week (2)	Week (3)	Week (4)	Week (5)	Week (6)	Week (7)	Week (8)	Week (9)	Week (10)	Week (11)	Week (12)
Planning												
Design												
Development												
Testing												
Documentation												

Chapter 6

Conclusion

6.1 Summary of What Was Done and Achieved

various local services in a simple and organized way. Throughout the project, we applied what we learned in our course to design an interactive website using HTML, CSS, and JavaScript.

We developed a complete front-end solution that allows users to search for business categories, filter results based on location, and view important details such as business name, description, contact information, and embedded Google Maps location. The website also highlights top-rated businesses, making it easier for users to choose the best options.

The design focused on user-friendliness, mobile responsiveness, and clean structure. The result is a functioning front-end that simulates the user experience of a real-world local directory

6.2 Key Findings and Results

By the end of the project, we achieved:

- A fully responsive front-end website with multiple business categories.
- A working search feature that helps users quickly find relevant listings.
- Filtering options that allow users to narrow down results by location.
- Business cards with all essential information, including Google Maps.
- Highlighting of top-rated businesses for better user decision-making.

These features provide a practical and simple solution for anyone looking to explore local services.

6.3 Limitations

Despite reaching our project goals, there are some limitations:

- The content is static; there's no dynamic data or back-end database.
- Users cannot leave reviews, sign up, or interact with the website.
- Business owners have no way to manage or add their listings.
- Filtering is limited and does not support advanced criteria like price range or availability.

6.4 Suggestions for Future Improvements

For future development and enhancement of the project, we suggest:

- Adding a back-end and connecting the site to a real database for dynamic listings.
 - Allowing user registration and login features.
 - Enabling users to rate and review businesses.
 - Developing an admin dashboard for business owners to manage listings.
-
- Expanding filtering options to include services, ratings, and opening hours.

Supporting multiple languages for wider accessibility.

Resources

[1] W3Schools – Web Security Guidelines

<https://www.w3schools.com>

[2] Codecademy – Web Development Security Basics

<https://www.codecademy.com/pages/paid-plans>

[3] GeeksforGeeks – Front-End Security Tips

<https://www.geeksforgeeks.org>

[4] FreeCodeCamp – Introduction to Secure Web Apps

<https://www.freecodecamp.org>

[5] Wired. (1997). Get Yer Info-Nuggets.

<https://www.wired.com/1997/07/get-yer-info-nuggets>

[6] Jasmine Directory. (2023). Business Directories and Consumer Behaviour: An Analytical Study

<https://www.jasminedirectory.com/blog/business-directories-and-consumer-behaviour-an-analytical-study>

[7] Bright Local. (2021). Business Listings Trust Report.

<https://www.brightlocal.com/research/business-listings-trust-report>

[8] Akram, M., Sohail, I., Hayat, S., Shafi, M. I., & Saeed, U. (2010). Search Engine Optimization Techniques Practiced in Organizations: A Study of Four Organizations. arXiv

<https://arxiv.org/abs/1006.4558>

[9] BrightLocal. (2024). Business Listings Visibility Study.

<https://www.brightlocal.com/research/business-listings-visibility-study>

[10] Wikipedia. (2024). Reputation Marketing.

https://en.wikipedia.org/wiki/Reputation_marketing

[11] Wired. (2000). Chaos Dogs Dot-Com Directories.

<https://www.wired.com/2000/08/chaos-dogs-dot-com-directories>

[12] BrightLocal. (2018). Local Citations Trust Report.

<https://www.brightlocal.com/research/local-citations-trust-report>

Cheat:



Page 2 of 61 - Integrity Overview

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Top Sources

- 3% Internet sources
- 1% Publications
- 3% Submitted works (Student Papers)

Top Sources

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8	Internet	dermatologists.veooz.com	<1%
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Appendix:

<https://github.com/Abdelrahman4542/local-business-directory>