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## Final Report for Online Job Portal System

## Project name: SkillConnect

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# Introduction

In today's fast-paced, digitally-driven world, the job search and recruitment process is more dynamic and interconnected than ever. Employers are constantly seeking efficient ways to connect with talented professionals, while job seekers look for platforms that offer simplicity, reliability, and a wide range of opportunities.

SillConnect is a modern solution designed to bridge the gap between job seekers and employers. Using the latest web technologies, it creates an easy-to-use experience for both candidates and employers. Job seekers can search for opportunities by category, location, or personal preferences, while employers can post job openings, review applications, and manage the recruitment process in an organized and efficient way.

## About SkillConnect

SkillConnect is a web-based platform designed to simplify the recruitment process for both employers and job seekers. It acts as a central hub where candidates can easily search, save on a wish-list, and apply for jobs, while employers can post job openings, manage applications, and track progress.

**Key Features:**

**For Job Seekers:**

* Register and create a detailed profile.
* Browse and filter job listings by category, location, or industry.
* Save job posts to a wish list for future reference.

**For Employers:**

* Create an organizational profile and post job listings.
* Filter and manage applications with ease.
* Label application statuses (e.g., "Pending," "Rejected," "Interview Scheduled").

# Background and Product Context

In Bangladesh, several job portals are popular, each serving different needs. The traditional job portals, such as BDjobs.com and Prothom-alo-jobs.com, function like free bulletin boards for job seekers. Job seekers can browse available jobs and view employer profiles, while employers pay to post job listings and search for suitable candidates. These portals typically provide a simple platform for employers to attract applications and for job seekers to find opportunities, with the employer paying for the service.

A second category of portals, like Bikroy.com, Clickbd.com, and Ekhanei.com, allows service providers to post ads for free. Employers also get free listings of service providers, earning revenue through sponsored ads displayed alongside these listings. However, unlike traditional job portals, these sites don’t often feature individual candidates offering specific skills for hire. The model is more about connecting service seekers and providers in a marketplace-like environment.

The third category is freelancing platforms like Upwork.com. On these sites, candidates post their skills, availability, and rates. Employers can browse profiles for free but must pay a fee when they hire a candidate. Freelancing platforms primarily generate revenue from candidates by taking a commission from their earnings, rather than charging employers directly.

The fourth category overlaps with social networking solutions. Platforms like LinkedIn, Facebook, and Google+ allow users to display their professional profiles. However, they don’t offer HR tools like filtering and enlisting candidates. While these social networks provide a vast database of profiles, their utility for HR professionals is limited, making them less effective for recruitment.

Given the limitations of these four categories, there’s potential to create a platform that combines the best aspects of the first three categories. This platform could be free for both employers and candidates. Employers could browse, filter, and shortlist candidates anonymously, similar to freelancing sites. They could also engage in real-time chat, voice, or video calls, view candidates' geographic locations on a map, and analyze skill distribution using heat maps. Employers would be able to plan where to set up new offices based on the availability of skilled workers in different regions. Candidates, in turn, would be able to list their skills, including formal and informal ones, and view demand trends for specific skills. They could form alliances with others who have similar skills and use mobile devices to stay available for hire at any time.

This platform could also include features that overlap with social networking services, such as the ability for candidates to post their skills, track employer searches, and take action based on demand trends. It would aim to create a more interactive, user-driven experience compared to traditional job portals, which may push it to resemble platforms like Twitter, Facebook, or LinkedIn in certain ways. However, the key challenge would be striking the right balance between interactivity and privacy. Employers would need to ensure that privacy protections are in place, while preventing unauthorized individuals from using the platform as a tool to quickly find resumes.

Designing such a platform would require careful thought. Should it resemble social networking sites with interactive features, or should it maintain the traditional, professional look of a job portal? Would it have a broad scope like a global HR management tool, or would it focus on specific industries or skill sets? These are questions that need to be addressed early in the design process, as the platform will need a robust technical infrastructure to handle features like live chat, geolocation data, and skill heat maps.

If the goal is to develop a long-term platform, it’s essential to align closely with the product vision. While technology projects focusing solely on the development of the platform may not require in-depth analysis, a product that aims to be a long-term solution needs to ensure that the development team fully understands the vision and goals of the platform. This ensures that the user experience (UX) is designed with usability, accessibility, and user satisfaction in mind, ultimately saving time and resources by reducing the need for rework.

# User Story

## Use Case 1: Hiring an HR Manager

**User:** Mrs. Nabila, Head of HR at a multinational corporation (MNC).

**Scenario:** Mrs. Nabila needs to hire an HR Manager for her company and has two options available.

**Option A: Search for Candidates on Skill Connect**

* **Action**: Mrs. Nabila logs into **Skill Connect** and starts her search for HR Manager candidates.
* **Features Used**:
  + **Advanced Search Filters**: She uses filters to search for candidates based on specific criteria such as job experience, salary range, education, and qualifications.
  + **Notifications**: Using **Skill Connect**, she can send notifications via email or mobile to shortlisted candidates, inviting them for the next steps in the recruitment process, such as interviews or exams.
  + **Real-Time Updates**: Mrs. Nabila is notified as new candidates apply, and she can track the hiring progress through **Skill Connect**.
* **Outcome**: Mrs. Nabila successfully finds and shortlists candidates, notifying them of the next steps using **Skill Connect's** built-in communication system.

**Option B: Post a Job and Let the System Match Competencies on Skill Connect**

* **Action**: Mrs. Nabila posts a job ad for the HR Manager position on **Skill Connect**, detailing the job description (JD), required skills, and qualifications.
* **Features Used**:
  + **Job Posting**: She creates a detailed job listing on **Skill Connect**.
  + **Notifications**: Mrs. Nabila can send notifications to candidates, inviting them to proceed to the next stage, such as interviews or exams.
* **Outcome**: By posting the job and utilizing the systems on **Skill Connect**, Mrs. Nabila can quickly reach out to the most suitable candidates and streamline the hiring process.

## Use Case 2:

**User:** Mr. Anik, Marketing Manager at a large retail chain.  
**Scenario:** While returning home from work, Mr. Anik's car breaks down in the middle of the road.

**Option A - Search for Nearby Mechanics:**

* **Action:** Mr. Anik logs into Skill Connect and searches for available mechanics using the location filter.
* **Real-Life Advantage:** He quickly finds a mechanic nearby, saving time in a stressful situation. The search feature ensures he gets accurate results based on his current location.

**Option B - Post a Job Request:**

* **Action:** Mr. Anik posts a job request for an emergency car repair. The system automatically notifies mechanics in the area.
* **Real-Life Advantage:** Mechanics receive the request immediately, increasing the chances of a fast response. The notification feature eliminates the need for him to manually search for help.

## Use Case 3:

**User:** Mr. Ayman, a parent seeking a tutor for his high school daughter.  
**Scenario:** Mr. Ayman wants to hire a qualified tutor to help his daughter improve her performance in mathematics.

**Option A - Search for a Tutor:**

* **Action:** Mr. Ayman logs into Skill Connect and uses the platform to search for qualified tutors in mathematics. He filters by expertise, location, and availability.
* **Real-Life Advantage:** The search results provide him with a list of tutors who match his requirements. He can easily view their profiles, qualifications, and testimonials, helping him make an informed decision.

**Option B - Post a Tutor Request:**

* **Action:** Mr. Ayman posts a job request on Skill Connect, specifying his daughter’s tutoring needs, such as subject, grade level, location, and preferred schedule.
* **Real-Life Advantage:** Interested tutors, such as Ms. Farzana, receive notifications and respond directly to the job post. This saves Mr. Ayman the hassle of searching, as suitable candidates approach him proactively.

**Outcome:** Skill Connect provides Mr. Ayman with two efficient ways to find the ideal tutor for his daughter, either by actively searching or passively receiving responses from qualified professionals like Ms. Farzana.

## Limits

1. **Scalability Challenges:** The platform may struggle to handle high traffic or a growing user base without significant infrastructure upgrades.
2. **Security Risks:** Sensitive user data like personal details and payment information require strong encryption and regular updates to prevent breaches.
3. **Limited Features Compared to Competitors:** Competitors like LinkedIn offer advanced features such as AI-driven recommendations, which may make our platform less appealing.
4. **Accessibility Issues:** Lack of features for users with disabilities, such as screen reader support, may exclude a significant audience.
5. **Dependency on Internet Connectivity:** Users in areas with poor internet may struggle to access the platform’s features effectively, limiting its reach.
6. **Dependence on Stripe for Payments:** Relying on Stripe limits payment functionality in regions where it is unavailable or unsupported, restricting expansion.
7. **User Retention and Engagement:** Keeping users engaged long-term is challenging without continuously introducing new features or addressing feedback effectively.
8. **Lack of Offline Functionality:** The platform doesn’t support offline use, which could inconvenience users who want to prepare applications or search jobs without consistent internet access.

# System Description

## Architecture

**Overview:**

The architecture of our project follows a **three-tier architecture** comprising the presentation layer, application layer, and database layer. It is designed to handle browser-based clients and provides flexibility for future integration with mobile applications or other platforms.

**Details for the Final Report:**

1. **Centralized Database:**
   * Our project uses **MySQL** as the primary database hosted on a local server via XAMPP, which stores all critical data, including user credentials, job listings, employer profiles, job seeker profiles, and application details.
   * The database schema is designed for scalability to accommodate future growth in user volume and additional features.
2. **Application Server:**
   * The **Apache server** is used to handle requests, serve static content, and execute PHP scripts for backend logic.
   * **PHP** is the primary language used for server-side scripting, ensuring secure and efficient handling of user requests and responses.
   * Middleware libraries, like **Composer** for managing Redis caching and Stripe payment integration, have been integrated into the architecture.
3. **Frontend (Presentation Layer):**
   * The user interface is built with **HTML, Bootstrap, CSS**, and **jQuery**, ensuring a responsive design for seamless user interaction across devices.
   * AJAX is used to handle live searches, lazy loading, and other dynamic interactions for a better user experience.
4. **Caching Mechanism:**
   * **Redis** is incorporated to enhance performance by caching frequently accessed data, such as the most-visited jobs and testimonials.
5. **Authentication and Integration:**
   * **OAuth-based GitHub login** provides an alternative to traditional login methods, improving user convenience and security.
   * **Stripe integration** is implemented for secure payment processing, allowing employers to post premium job listings or access premium features.
6. **Potential Scalability Considerations:**
   * The architecture is modular, allowing for the transition to a distributed system in the future.
   * Future enhancements may include the introduction of NoSQL databases, like MongoDB, to manage unstructured data (e.g., user behavior or activity logs).
7. **Performance and Security:**
   * Ensuring acceptable performance benchmarks is a priority, with optimizations in database queries and caching mechanisms.
   * Sensitive data, such as credentials, is encrypted using hashing algorithms for security.

## Front-end

A total of 8 page-templates in plan

1. Home page
2. Job List Page
3. Search Result Page
4. Job details page
5. Candidate details page
6. Job creation page
7. Register/login page
8. Candidate profile creation page
9. Employer details page

## Back end development

1. Account Creating, Password Recover:
   1. Sign up form
   2. Login
   3. Github login
   4. Forgot Password
   5. MySQL Database
2. Profile Management:
   1. DB plan design and dev: MySQL
   2. Employer’s Profile
   3. Job Seeker’s Profile
   4. Others
3. Searching facility:
   1. Job category based
   2. Location based
   3. Employee search
   4. Job Search

## Others Comments

* Mobile first design
* Bot filtering by captcha
* Privacy option for both employer and candidates.
* High level outline of requirements
* Will allow anonymous browsing for resume
* Will allow anonymous uploading of CV with just name and
* Responsive front end
* Assuming coverage area Bangladesh only
* Auto keyword generation and indexing from uploaded resume in phase 3
* Bulk download of data of list is not allowed to anonymous users. It can become allowable to paid/verified/premium category of users.

# Development Plan

Development methodology will adopt agile methodology. Each cycle will complete in exactly 2 weeks (10 working days). At the end of each cycle, developing team will release a working software version. The platform planner team, UX designer team and the developer team will meet, run the software, test and provide their feedbacks vice versa. In the next cycle, each team updates their development plan within acceptable range of change.

## Phase 1

Duration: Total 6 weeks for development and 1 week for final deployment. This phase shall develop a minimum viable product (MVP) with basic and initial UX. However, this phase will lay foundation of middleware to support SOA. Support front end plan as of April 30, 2017

### Deliverables:

At the end of this phase, customer will receive a fully deployed functional website with acceptable performance and user experience. Basic hosting choice will be governed by emphasis on performance and minimal latency. It will satisfy use cases as described in the use case section update as of April 30, 2017

## Phase 2

Phase 2 will comprise of optimization and performance targets as detailed in the solution description.

### Deliverables:

Optimized performance tuned site.

## Phase N

Phase 1 and Phase 2 will help decide goals and expectation from the next phases. The next required features can be mobile version for master push notification to job hunters or service providers who love to receive job alert or service request and respond instantly. The evolved user stories and learning from utilization gathered from 360 degrees of users all together will help guide design and development. Hence prior to this next phase it will be important to have a solid planning session.

# Hardware/Hosting Plan

Here is a list of possible cloud plans. We have to choose one that fits best and also economical.

**Table 1: Cloud hosting plans**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Cloud Provider** | **DC location** | **Latency (ms)** | **Starter description** | **Starter price**  **(USD)** | **Mobile app ext. (with Redis)** | **Mobile app ext. price (USD)** | **Total expense (USD/mo)** |
| AWS  (Amazon Inc.) | Singapore | 83 | EC2- small, EBS, Transfer 20TB, 0.12$/GB | $16.84 | 0.022/hr for a cache.t2.micro, goes lower ($0.009/hr) with 3 year term | $15.84 | $32.68 |
| Godaddy  (Godaddy Inc.) | Singapore | 80 | 1 GB memory, 1 core, 30GB SSD, 2TB Transfer | $14.99 | 512 MB memory 1 CPU 20GB SSD 1TB transfer | $5.00 | $19.99 |
| Azure (Microsoft) | Chennai | 110 | 1 core, 20 GB Disk, $0.018/hr, 0.75GB memory | $13.39 | 250MB, $0.022/hr | $16.37 | $29.76 |
| Azure (Microsoft) | Singapore | 88 | 1 core, 20 GB Disk, $0.018/hr, 0.75GB memory | $13.39 | 250MB, $0.022/hr | $16.37 | $29.76 |
| GCP  (Google Inc.) | Singapore | ?? | 1 shared vCPU .6 GB memory 10 GB disk | $4.28 | 0.6 GB memory, 10 GB disk | $4.28 | $8.56 |

# Collaboration Plan

All issues to be reported on JIRA system at [https://YourCompanyAtoZ-issues.atlassian.net/](https://ibcr-issues.atlassian.net/). YOURCOMPANYATOZ will provide access credential to XYZ team for raising issues as the development progresses.

**Table 2: Collaboration plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Schedule** | **YOURCOMPANYATOZ** | **XYZ** |
| Host dev-site and develop | ongoing basis | y |  |
| Build and release | every Thursday | y |  |
| Run Build Verification Tests (BVT) | every Sunday morning | y |  |
| Functional testing and reporting on JIRA | every Sunday morning | y | y |
| Full testing for QA check (Black box) | every alternate Sunday | y | y |
| Summary and discussion | every alternate Sunday | y | y |
| provide feedback on UI and functionality | as per need | y | y |
| use case testing | as per need | y | y |
| User data population (job, hr employer, candidates etc.) | as per need |  | y |

# Project Schedule

Phase 1 will take a total of 6 weeks from the day of start. Calculated Man-month = 8.5/4 = 2.123. Excluding front end development it will become

**Table 3: Phase 1 Schedule**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Week** | | | | | | | | | |  |
| **SL** | **Deliverable** | **1** | | **2** | | **3** | | **4** | | **5** | | **Man-week** |
| 1 | Front end development\* | - | - | - | - | - |  |  |  |  |  | 2.5 |
| 2 | Profile management |  | - | - | - |  |  |  |  |  |  | 1.5 |
| 3 | Account management |  |  |  | - | - | - |  |  |  |  | 1.5 |
| 4 | Search facility |  |  |  |  | - | - | - | - |  |  | 2.0 |
| 5 | Deployment and final release |  |  |  |  |  |  |  | - | - |  | 1.0 |
|  | **Total duration** | **1.5** | | **2.5** | | **2.5** | | **1.5** | | **0.5** | | **8.5** |

\* Assuming that front end PSD to HTML conversion will done by XYZ team

# Budgetary Price

Excluding front end development (2.5 man-week) total time plan = 6 weeks. Following table shows development expense. In addition, based on requirement as it reveals during project development YOURCOMPANYATOZ will help XYZ choose the appropriate cloud hosting. That expense is not included here.

**Table 4: Expense Breakup for Development**

|  |  |  |  |
| --- | --- | --- | --- |
| **SL** | **Deliverable** | **Expense** | **Comment** |
| 1 | UI design | xxxxx |  |
| 2 | Front end development (PSD wireframe to HTML transfer) | xxxxx |  |
| 3 | Django back-end development | xxxxx |  |
| 4 | Database design (MySQL and MongoDB) | xxxxx |  |
| 6 | Setting up middleware (Rabbit MQ) | xxxxx |  |
| 7 | UI integration ( HTML clean up and optimization) | xxxxx |  |
|  | Total | xxxxx |  |

**Note:** Price is excluding of any Tax, VAT and other levies.

# Appendix

## Contact information

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