HANDY KSA: A Home Maintenance Solution for Saudi Arabia

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1. Introduction

• The Kingdom of Saudi Arabia (KSA) is a country located on the Arabian Peninsula in western Asia

• KSA has the largest economy in the Middle East

• The booming oil-based economy makes the KSA an attractive destination for foreigners who are seeking employment

http://www.operationworld.org/files/ow/maps/lgm ap/saud-MMAP-md.png
2. Background Information

- Nearly **one third** of the adult workforce is foreign-born
- There is a significant population of illegal foreign workers in the KSA
- In 2014, the Saudi government deported 420,000 individuals over a 6-month period

Background Information (cont.)

- Illegal foreign workers particularly impact the **home services industry**
  - This field includes maintenance workers such as: plumbers, carpenters, electricians, painters, etc.

- This field is susceptible to foreign workers because it is not highly regulated
  - Most maintenance workers are self-employed
  - There is little government oversight

3. Problem Statement

- The home maintenance industry has become overrun with illegal foreign workers who:
  - Take jobs from Saudi residents
  - May not be qualified or properly certified to perform their claimed services

- Saudi residents do not have a reliable way to distinguish between local, certified workers and illegal foreign workers.

- There is no medium to give feedback after a bad experience.

- KSA residents are in dire need of a solution that allows them to find home maintenance workers who are qualified, trustworthy, and capable of producing high-quality results.
4. Project Objective

- The goal of this project is to improve the process of finding and hiring high-quality maintenance workers for the people of Saudi Arabia.
5. Stakeholders

- Customers
  - Create demand for services
  - Use system to hire maintenance workers and give feedback

- Maintenance Workers
  - Meet the demand for services
  - Use system to create merchant profiles and upload credentials

- Government
  - Guide economic policy that supports success of the system
6. System Requirements

1. The system shall connect customers to maintenance workers
2. The system shall ensure safety of customers
3. The system shall be easy/efficient to maintain
4. The system shall be easy to navigate by users
6. System Requirements

5. The system shall verify credentials of maintenance workers

6. The system shall be secure

7. The system shall assist the entire maintenance process

8. The system shall allow customers and workers to rate each other
7. Alternative Solutions

Three Alternative Solutions include:

1. The Current System
2. Home Maintenance Company
3. HANDY KSA
7. Alternative Solutions—The Current System

- Currently, there is not much regulation or organization in the hiring of home maintenance workers in KSA.

- When some kind of home maintenance service is needed, Saudi residents generally do one of the following:
  - **Word of mouth:** taking recommendations from friends, family, and neighbors.
  - **Internet search:** using search engines or social media to find maintenance workers.

- This method may lead to unqualified workers or overcharging for services.
1. Maintenance work required
2. Word of mouth
3. Internet search
4. Contact maintenance worker
5. Maintenance worker arrives, quotes price of service
6. Maintenance work completed
7. Payment

High-level Operation Concept: Simplified Diagram (G. 1.4) for the Current System
7. Alternative Solutions—Home Maintenance Company

- Local companies that specialize in home maintenance.
- The home maintenance company employs a number of maintenance workers with various specialties.
- Safer for customers because workers are guaranteed to be qualified.

High-Level Operational Concept Graphic Diagram (OV-1) for Home Maintenance Company

1. Maintenance work required
2. Contact maintenance company
3. Maintenance worker arrives, quotes price of service
4. Maintenance work completed
5. Payment

Cash
7. Alternative Solutions—HANDY KSA

- Smart phone system designed to improve transparency and customer safety in the maintenance process.

- Through the system, customers are able to
  - Search for nearby maintenance workers, view their qualifications, and read customer reviews
  - Send photos and have full consultations with maintenance workers
  - Pay for services and leave reviews
High-Level Operational Concept Graphic Diagram (OV-1) for HANDY KSA
8. Analysis of Alternative Solutions

Consist of three Steps:

1. Define the Measures of Effectiveness (MOEs) to assess alternatives

2. Assess each alternative with the MOEs

3. Analyze the results and select the best alternative
# Measures of Effectiveness

<table>
<thead>
<tr>
<th>MOE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>The system should not be harmful to its users.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>The system should function without wasting time, energy, or other resources.</td>
</tr>
<tr>
<td>Reliability</td>
<td>The system should be able to consistently perform its processes without failure or mistakes.</td>
</tr>
<tr>
<td>Cost-Efficiency</td>
<td>The system should produce the most cost-efficient results for its users.</td>
</tr>
<tr>
<td>Affordability</td>
<td>The system should not be expensive to operate or use.</td>
</tr>
<tr>
<td>Customizability</td>
<td>The system should be customizable to the desires of the user.</td>
</tr>
<tr>
<td>Accessibility</td>
<td>The system should be easily accessed by its users.</td>
</tr>
</tbody>
</table>
# MOE Analysis

<table>
<thead>
<tr>
<th>MOE</th>
<th>The Current System</th>
<th>Home Maintenance Company</th>
<th>HANDY KSA Smart Phone system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Reliability</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Cost-Efficiency</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Affordability</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Customizability</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Selected Alternative

• HANDY KSA will be the chosen alternative.
• The app will assist the entire maintenance experience.
• The app will allow customers to
  • Search for nearby maintenance workers
  • View their qualifications
  • Read customer reviews
  • Pay for services

Selected Alternative (cont.)

- Maintenance workers and customers must create an account on HANDY KSA.

- Worker identity and credentials must be verified before a worker’s account will be active.

- Maintenance workers become involved in the process only after receiving a message from a customer.
Selected Alternative (cont.)

- The KSA government is not directly involved in the maintenance process.
- The government is able to set policies that influence the operation of HANDY KSA.

9. Operational and System Overview

Broken down into three main categories:

1. Essential Operations—Customer Side
2. Essential Operations—Worker Side
3. Ongoing Management
High-Level Operational Concept Graphic Diagram (OV-1) for Essential Operational Functions—Customer Side
Customer Site Home Page
Customer Site Search Process

SmartSearch
What type of services do you require?
- Electrician
- Painter
- Plumber
- Tile Repair

Manual Search

Please enter your search criteria

Specialty:
Distance from me:
Average rating:
Customer Site Search Process (cont.)

![Search Results](image1)

1. **Omar M.**
   - 5 stars
   - 0.5 km away

2. **Ahmed M.**
   - 4 stars
   - 0.5 km away

3. **Saad A.**
   - 4 stars
   - 0.5 km away

**Omar M.**
- 5 stars
- 0.5 km away

**BIO**
- 25 years of experience

**Skills/Specialties**
- Carpenter
- Contractor
- Painter

**Reviews**
- 5 stars
- Omar was great! He painted my entire house in one day and...

**Chat**
**Bookmark**
Customer Site Chat Process

HANDY KSA
Customer Site

OMAR M.
0.5 KM AWAY

Hello, do you paint houses?

Yes, house painting is my specialty!

SEND

Are you available Monday?

Send
Photo

I'M INTERESTED

HANDY KSA
Customer Site

OMAR M.
0.5 KM AWAY

*I'M INTERESTED*

QUOTE: 3,000 SR

SEND

HANDY KSA
Customer Site

OMAR M.
0.5 KM AWAY

QUOTE: 3,000 SR

*QUOTE ACCEPTED*

Send

Monday at 10:00 AM? My address is...

Hire
Now

Keep
Looking

Pay Now
Customer Site Payment Process

![Image of a mobile application displaying a payment screen with the name Omar M., services rendered as "House Painted," and a grand total of 3,000 SR. The screen also features a "Pay Now" button.](image-url)
Customer Site Rating/Review Process
High-Level Operational Concept Graphic Diagram (OV-1) for Essential Operational Functions—Worker Side

1. Download
2. Registration
3. Verification
4. Chat
5. Payment
6. Review
Worker Site Home Page
Worker Site Chat Process

Hello, do you paint houses?

Yes, house painting is my specialty!

Send

Myriam S.
5 stars
0.5 km away

Is interested in hiring you! Please enter a quote:

3,000 SR

Send quote

Quote: 3,000 SR

*Quote accepted*

What time on Monday should I come?
Worker Site Payment Process

Handy KSA Worker Site

Myriam S.
Has paid you
3,000 SR
Please complete a
rating to receive
your payment

Review
Worker Site Rating/Review Process
Ongoing Management: HANDY KSA Company Hierarchy

CEO

- Director of Marketing and Analytics
  - Customer Service Staff
  - Verification Staff
- Director of Finances and Technology
  - IT Staff
- Director of Human Resources
### 10. HANDY KSA Risk Assessment and Matrix

<table>
<thead>
<tr>
<th>Number</th>
<th>Risk</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Glitch discovered Technological failure Servers down</td>
<td>Moderate</td>
<td>High</td>
<td>Follow risk scenario 1 protocol</td>
</tr>
<tr>
<td>2</td>
<td>Maintenance worker does not show up for job</td>
<td>Moderate</td>
<td>Low</td>
<td>Follow risk scenario 2 protocol</td>
</tr>
<tr>
<td>3</td>
<td>Maintenance worker does not complete job</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Follow risk scenario 2 protocol</td>
</tr>
<tr>
<td>4</td>
<td>Customer refuses to pay</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Investigate issue, use stored payment information if necessary</td>
</tr>
<tr>
<td>5</td>
<td>Security breach User data is leaked</td>
<td>Low</td>
<td>High</td>
<td>Secure data, notify all affected users</td>
</tr>
<tr>
<td>6</td>
<td>Violence toward customer or maintenance worker</td>
<td>Low</td>
<td>High</td>
<td>Report to local law enforcement, investigate issue, ban aggressor if necessary</td>
</tr>
<tr>
<td>7</td>
<td>Staff error</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Re-train or replace staff if necessary</td>
</tr>
</tbody>
</table>

![Risk Matrix Diagram](image)
Risk Scenario Protocols

Risk Scenario Protocol 1: Technological Failure
1. IT Staff will determine the source of failure.
2. IT Staff will resolve error by updating codes, creating a patch, etc.
3. IT Staff will perform testing to ensure system error has been corrected.
4. Customer Service staff will inform affected users via email that the issue has been resolved.

Risk Scenario Protocol 2: Physical Failure
1. User will notify HANDY KSA Customer Service Staff of the issue.
2. If the maintenance worker did not arrive or is unable to complete the job, staff will find another suitable maintenance worker, contact the new maintenance worker, attempt to negotiate a similar price, and schedule an appointment as soon as possible.
This figure illustrates the original operational activity model for HANDY KSA prior to applying lean thinking principles.
11. Lean Thinking (After)

This figure illustrates the original operational activity model for HANDY KSA after applying lean thinking principles.
12. Ethics

The most ethical consideration that must be addressed is

Access to Technology

- Saudi Arabia ranks among the highest penetration of smartphone usage in the world
  - 65 percent of the population uses a smart phone
- Trends are pointing toward phone-only services
  - Uber, etc.
## 13. Cost Analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Item</th>
<th># Needed</th>
<th>Total Yearly Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>Smart phone application development</td>
<td>1</td>
<td>$17,000</td>
</tr>
<tr>
<td>Overhead Staffing</td>
<td>Office space rental</td>
<td>1</td>
<td>$12,000</td>
</tr>
<tr>
<td></td>
<td>IT Staff</td>
<td>3</td>
<td>$153,000</td>
</tr>
<tr>
<td></td>
<td>Verification Staff</td>
<td>3</td>
<td>$75,000</td>
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<tr>
<td></td>
<td>Customer Service Staff</td>
<td>3</td>
<td>$60,000</td>
</tr>
<tr>
<td></td>
<td>CEO</td>
<td>1</td>
<td>$250,000</td>
</tr>
<tr>
<td></td>
<td>Director of Marketing and Analytics</td>
<td>1</td>
<td>$112,000</td>
</tr>
<tr>
<td></td>
<td>Director of Finances and Technology</td>
<td>1</td>
<td>$161,000</td>
</tr>
<tr>
<td></td>
<td>Director of Human Resources</td>
<td>1</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$940,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. Return on Investment (ROI)

- **Revenue** will be generated from:

  1. A service fee associated with each transaction made on HANDY KSA
  2. Advertisement space on the system interface sold to local businesses

https://www.boostmyshop.com/media/catalog/product/cache/8/image/255x/9df78eb33525d08d6c5fb8d27136e95/b/o/boost-my-shop-profit-report-for-magento.png
15. Verification

- The system shall connect customers to maintenance workers
  - Verified through testing of system’s functions from start to finish

- The system shall ensure safety of customers
  - Verified through testing of the system’s built-in security features
  - There are protocols in place to address safety threats that range from breaches in security to physical acts of intimidation or aggression

- The system shall be easy/efficient to maintain
  - Verified through testing of the HANDY KSA system over a period of time
16. Validation

- The system will not be validated from the moment it begins functioning.

- Once a sizeable community of users—both customers and maintenance workers—have registered and created profiles on the smartphone application, the system will become increasingly active.

- As system utilization increases, HANDY KSA can be validated as successfully reaching its goals.
17. Conclusion

- Growing up in Saudi Arabia, I noticed the stress and anxiety that occurred when trying to find and hire maintenance workers.

- With recent advances in technology, I felt that a smart phone application would be a perfect solution to this problem.

- My hope is that HANDY KSA will be used not only to create a more efficient means of hiring maintenance workers, but also to improve safety of consumers.
Works Cited


