Vision and Scope Document

for

Smart Pile Inspector System

Version 1.0

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HighSpans
ENGINEERING, INC.

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Revision History

Name	Date	Reason For Changes	Version
Alejandro Figueredo	1/29/2022	initial draft	1.0 draft 1

1. Business Requirements

1.1. Background

HighSpans Engineering, Inc., is a civil engineering consulting firm that specializes in structural design, construction engineering and inspection, and transportation materials testing. This company's design is based on three major areas: design area (computer systems/engineers), plant inspection (asphalt/concrete testers), and construction engineering inspection (CEI). HighSpans provides CEI services to government agencies and Specialty Engineering services to assure clients that their projects are built by their plans and specifications. To do these, inspectors use an apparatus called "saximeter" which calculates diesel hammer stroke or hammer blows per minute (BPM) to estimate how much strength is put into every concrete pile that is inserted on the ground; the pile that is going to be the foundation of the bridge. Taximeters have a microphone installed that allows hearing every time the hammer hits the pile and calculates BPM by listening to the sound waves of every impact. This is the most accurate way to create a pile-driving log, yet, it has some deficiencies. Outsides noises can cause the readings from the saximeter to be inaccurate and sometimes even malfunction.

1.2. Business Opportunity

HighSpans' idea is to create software that helps the CEI inspector calculate the stroke of the hammer into the concrete pile by using an automatic system that is not affected by outside factors and provides more reliable readings, helping the inspector to provide accurate results to the clients. Such system would provide the inspector with a better understanding of whether the project has fulfilled the client's requirements, or it needs further inspection.

1.3. Business Objectives

BO-1: Obtain better readings from the software system that are not being altered by outside sources like vehicle noises, people, among others.

BO-2: Create pile-driving logs that show the behavior of the Smart pile while being hammered using the information recorded by the microphone installed in the system.

1.4. Vision Statement

CEI inspectors will receive help from the system by simply reading the results from the data recorded during the hammering process. Instead of using the saximeter (which can malfunction sometimes) and plotting data manually, the software will provide a more reliable way of recording data and plotting graphs with that information.

1.5. Business Risks

RI-1: The system might not work properly, reducing the return on investment from the system development and the changes in operational procedures.

RI-2: There could be operational risks where inspectors use the software incorrectly causing errors in data, consequently wrong decision-making.

RI-3: Failing to comply with any type of law or regulation set by the client, leading to possible fines or project termination.

1.6. Business Assumptions and Dependencies

AS-1: •There is a microphone with higher technology than the one installed in the saximeter.

AS-2: •The software is going to solve the issue.

AS-3: •There is going to be financial support with this project

AS-4: •The company will benefit from the usage of the system

2. Scope and Limitations

2.1. Major Features

FE-1: Use the microphone to provide reads on the hammer blows per minute (BPM) while not being affected by outside sources.

FE-2: Save data recorded by microphone and store it on a database.

FE-3: Create pile-driving logs that show the behavior of the Smart pile using the information in the database.

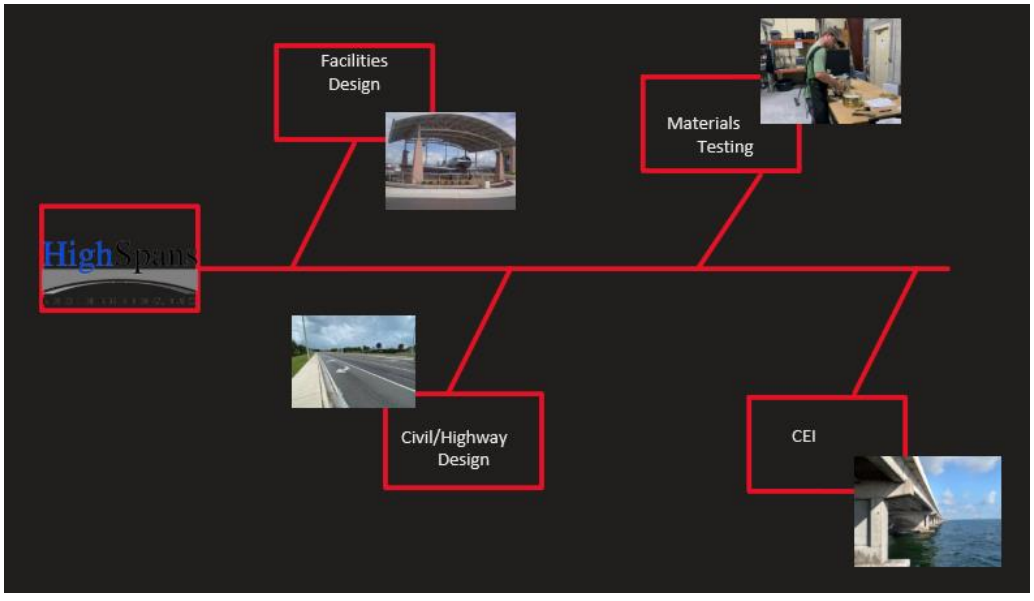

Figure 1. Business Overview.

2.2. Scope of Initial and Subsequent Releases

Feature	Release 1	Release 2	Release 3
FE-1, Reads on the hammer blows per minute			
FE-2, Save data recorded			
FE-3, Create pile-driving logs			

2.3. Limitations and Exclusions

LI-1: Software should only be used by Construction engineering inspectors and staff.

3. Business Context

3.1. Stakeholder Profiles

Stakeholder	Major Value	Attitudes	Major Interests	Constraints
Construction engineering inspectors	Test the system and determine whether it works properly			Technological knowledge
Computer system engineers	Developing and maintaining the software			Staff availability

3.2. Project Priorities

Dimension	Constraint	Driver	Degree of Freedom
Features			
Quality			
Schedule			
Cost			
Staff			

3.3. Deployment Considerations

Before launching the system, HighSpans' CEO, and other employees (including my sponsor) will test the software and determine whether it meets all the requirements and it is ready to be used in the workforce.

4. References

- Ryan Grimm. Manager of IT department in HighSpans Inc.
- https://highspans.com/
- https://www.pile.com/products/esax/
- Smart Structures, The global leader in wireless Embedded Data Collector (EDC) solutions to improve the quality of bridge pilings and deep foundations. (smart-structures.com)
- https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/programmanagement/implemented/specbooks/january2021/1-21ebook.pdf?sfvrsn=1c62cb58_2
- https://www.pm4dev.com/resources/docman/pm4dev-articles/14-the-project-constraints/file.html
- https://www.americanexpress.com/en-us/business/trends-and-insights/articles/7-business-risks-every-business-should-plan-for/

5. Acronyms and abbreviations

- FDOT: Florida Department of Transportation
- FSS: Federal Specification Standard
- CEI: Construction Engineering Inspection