

PIT Goodwill Inventory Automation

A project in collaboration with
Microsoft

Fall 2022



PennState

NittanyAi
Alliance

Key Project Details

Project Name	PIT Goodwill Inventory Automation
Partner Organization	PIT, Microsoft
Target Semester	Fall 2022
Project Type	Proof-of-Concept
AI Discipline	ML and CV
Proof-of-Concept Owner(s)	Ed Lada Goodwill
AI Alliance Director	Daren Coudriet (daren@psu.edu)
AI Advance Program Manager	Tim Hijazi (hjh5529@psu.edu)
Data Manager	TBD
Subject Matter Expert(s)	Ed Lada – Goodwill TBD - Microsoft
AI Associate(s)	Mikael Kaufman, Tomi Akindele, Samarth Terhi

Project Summary

The Public Interest Technology University Network (PIT-UN) is a partnership of colleges and universities committed to educating students who can better apply technical understanding and practice to questions of individual rights, justice, social welfare, and the public good, particularly for those members of our society least well served historically and today by existing systems and policies.

The focus of this project will be to assist Goodwill with automating its inventory of donated items, particularly shoes that are the most in demand items. The proof of concept will leverage ML/CV approaches to evaluate the condition of donated shoes, assign a monetary value, update incoming stocks, and deliver a donation receipt for tax purposes.

Problem Statement

Shoe donations are Goodwill's top in demand. Currently the process of evaluating the condition and value of donated shoes is conducted manually and is time consuming. Furthermore, the process of evaluation requires adequate staff training to yield consistent and accurate results. This proof of concept project will help Goodwill to leverage AI/ML/CV in order to have a consistent mechanism for determining the condition and value of donated shoe items as well as help their efforts to automate inventory management.

Project Objectives

The primary objective of this project is:

- 1) The focus of this project is to create a proof of concept that uses computer vision to automate capture of donated goods.
- 2) The project will be limited to shoes, capturing images and extracting data such as brand, condition, color, etc.
- 3) The project could add further value to Goodwill if it could also recommend a retail price, based on market data

Project Scope

The following define the project scope:

- 1) Confirm the business need Goodwill and shoe focus, while defining the data that needs to be created from the images.
- 2) Determine computer vision technology and approach capturing images and extracting needed data.
- 3) Define a training model that enables a user (donor) to correct the data provided by the system.

Project Deliverables

The following are the general deliverables for this project, to be confirmed with the PoC Owner:

1. Project wiki – students will update the wiki each week, so the client has a complete record of project artifacts at its conclusion.
2. Project GitHub repository – students will store any code resulting from the project for client access.
3. Sprint meeting minutes – students will conduct sprint review meetings to discuss the results and provide documented meeting minutes for each meeting.
4. Proof-of-Concept results – students will strive to create an enhanced proof-of-concept based on the client’s feedback provided at each of the bi-weekly sprint meetings.

Project Metrics for success

The following are shared metrics for success for this project:

1. Students reporting growth in one or more of the following core competency areas: multicultural awareness, systems thinking, ethical reasoning, civic responsibility, and professional development.
2. Students identified, validated, and tested existing AI/ML technologies that may be leveraged to enhance the automation of inventory management for Goodwill.

Project Data Strategy

The data for this project will be gathered from Goodwill with the assistance of Microsoft and the Faculty partner.

Project Resources & Funding

The AI Alliance will be utilizing three paid part-time students for a duration of approximately 14 weeks during the 2022 Fall semester. The students will be recruited and hired by Penn State as wage payroll employees. The AI Alliance will be responsible for management, time tracking and compensation for all students. The students will start the project on August 30th and will complete the project on December 9th.

Roles & Responsibilities

Strategic Leads: TBD – Microsoft and Ed Lada

Primary strategic leaders. Provide vision and oversight. Determine direction, evaluate options, and drive the project forward.

Proof-of-Concept Owner: Ed Lada - Goodwill

Primary client contact and decisionmaker. Attends and provides feedback at sprint review sessions. Facilitates connections with subject matter experts and data managers.

AI Advance Project Leader/Scrum Master: Daniel Clark

Primary AI Advance contacts. Project manager responsible for Associate activity and project progress. Facilitates sprint review sessions, workshops, and demonstrations. Accountable for project delivery.

Subject Matter Expert(s): TBD

Essential client contact. Attends and provides feedback at sprint review sessions related to their area of expertise. Relied upon for insight into validity of features and business process refinement.

Data Manager(s): TBD

Essential client contact. Facilitates access to required data sources. Provides data in required formats with any necessary adjustments and/or redactions to ensure project completion.

AI Associate(s): Mikael Kaufman, Tomi Akindele, Samarth Terhi

Nittany AI Advance team members specializing in Data Science, Machine Learning Natural Language Processing and Computer Vision Systems. Collaborate with each other and Project Manager to accomplish goals on time and to-spec.

Timeline & Key Dates

Our project strategy aims to ramp-up and ensure all parties are on the same page regarding goals, potential needs and checkpoints throughout the project, and necessary roles to be played by project team members.

During the project, we focus on a 14-week period within the Spring semester, ensuring maximal investment from the team and minimal intersections with significant academic milestones, such as delivery of term projects or final exam preparation. Some key dates are outlined below.

Launch Meeting: The launch meeting is designed to introduce the team to the client, discuss the problem being presented, the project objectives, scope and deliverables. The team can begin doing some homework prior to the Design Workshop.

Proposed Date: **Tuesday August 30th, 2022**

Design Workshop: The Design Workshop gets into the details of the project with the student team and solidifies a prioritized list of features/functions for the PoC. At this workshop assumptions are confirmed, and a feature backlog is generated for the team to pursue. The features are prioritized, and the team assigns levels of complexity to each item, which helps drive timeline estimates.

Proposed Date: **Tentatively September 6th, 2022**

PoC Sprint Meetings: The team works from a prioritized list of features/functions that have been pre-determined and agreed upon during the Design Workshop meeting. The results of each sprint are reviewed at the start of each sprint meeting. The client participates in each meeting, providing feedback and direction to help guide the team in the next sprint meeting. It is understood as new information is uncovered, the team's direction and work effort may be redirected.

Mid-Project Review: At approximately mid-semester, there is a project review with the client. This review is designed to reflect on the project experience thus far. This discussion is aimed at deciding on engagements for the following semester, if appropriate. We

scheduled this early enough such that the students have yet to finalize their plans for the upcoming semester should recruitment for separate internships be a priority.

Proposed Dates: **TBD, Target = Week of November 7th, 2022**

Project Wrap Up Meeting: The team presents their deliverables and summarizes the approaches and progress throughout the project: what worked (or didn't), and why. What was learned and what are some potential next steps, if any, for advancing the PoC.

Proposed Date: **TBD, Target = Week of December 5th, 2022**

Client Meeting Retrospective: Discussions at varying levels of resolution that focus on the project experience after its conclusion. What went well? What are your takeaways? What can we do better?

Proposed Date(s): **TBD, Target = Week of December 12th, 2022**

Signatures

Proof-of-Concept Owner

Nittany AI Advance Program Manager

Name:

Title:

Date:

Name: Tim Hijazi

Title: Nittany AI Advance Program Manager

Date: