

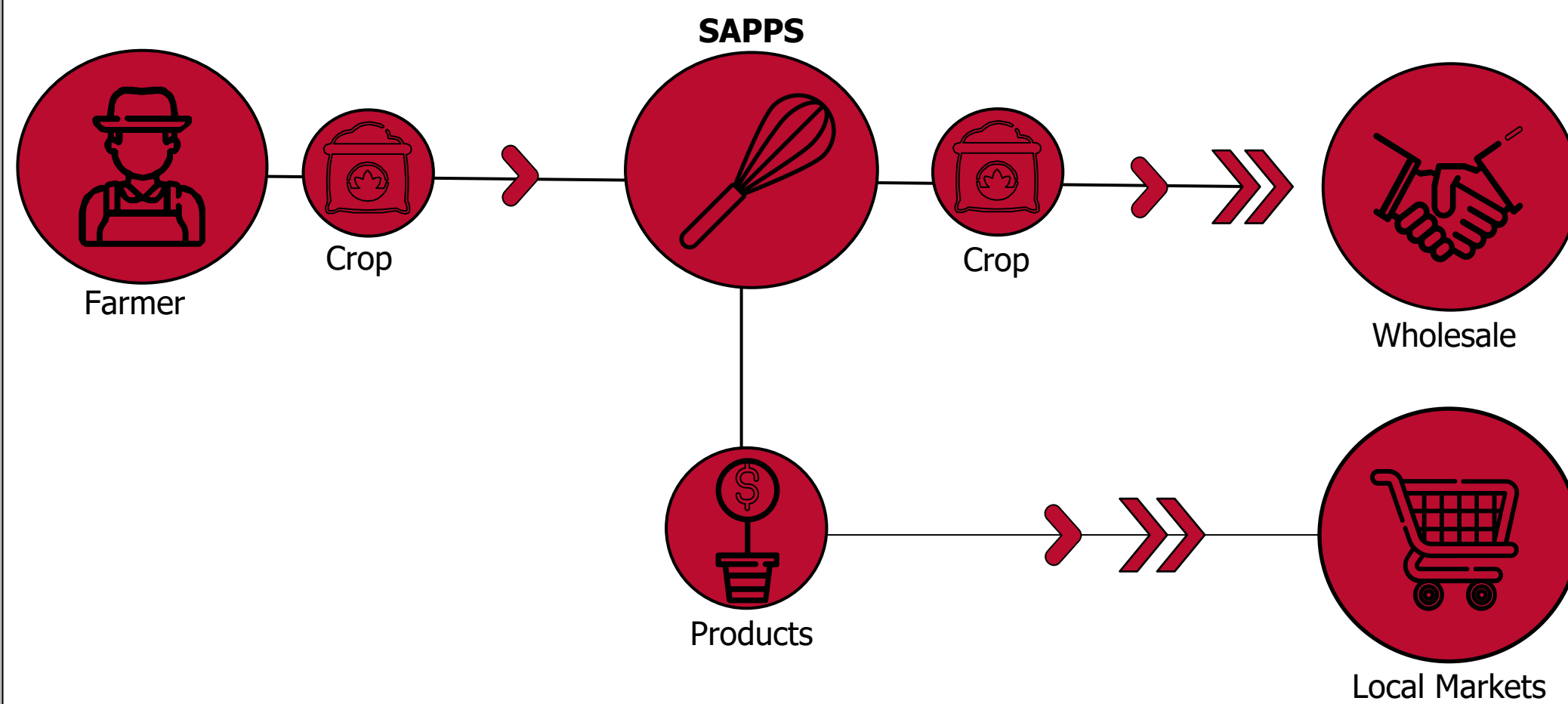
SAPPS - Small-scale Automated Peanut Processing System

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Introduction

- Due to a naturally occurring carcinogen called Aflatoxin, the sale of peanuts to consumers is regulated by the FDA unless peanuts undergo a "Kill Step".
- Current processing methods are not economical for farmers leading them to wholesale their crop, often receiving as little as \$0.26/lbs.
- SAPPS aims to bring farmers closer to consumers by enabling them to produce market-ready peanut products on farm.



Specifications

User Needs	Requirements
On farm/market system	Fluid system, singular system
Raw Peanut converted into Marketable Product	Minimal operation needs and small enough to fit in a farmer's market
Increases profit margin on raw peanut crop	4 Main processes: Frying, Seasoning, Processing, and Packaging
Minimal Investment	Only additional material ingredients and electricity needed to operate the system upon purchase
Interactive or engaging to user	Food grade materials (Stainless) in line with FDA regulations concerning food safety
Easily sanitized and maintained	Must be reproducible and affordable for small-scale farmers
Fluid system, singular system	Visible processes that allow customers to observe each step while the system is operating

Prototyping

- The system was broken down into four processing steps: Frying, Seasoning, Mixing, and Processing, and installed on a portable frame
- Sensor-based automation was integrated into each component to allow the peanuts to transition from one phase to the next, seamlessly.

Our current prototype, which creates peanut butter, is shown below in further detail:

Phase 1: Frying



- Peanut dispenser drops peanuts into a retrofitted Belshaw Donut Fryer. The fryer's automated conveyor moves peanuts through oil

Phase 2: Seasoning



- Peanuts exit fryer and slide under seasoning dispenser, triggering the dispenser to dispense into mixer bowl

Phase 1: Mixing



- A retrofitted stand mixer is activated when peanuts & seasoning enter. A trap door on the bottom of the bowl opens & peanuts exit

Phase 4: Processing



- Peanuts are dropped into grinder. The grinder grinds them into peanut butter and deposits the peanut butter into a container

The Integrated Unit:

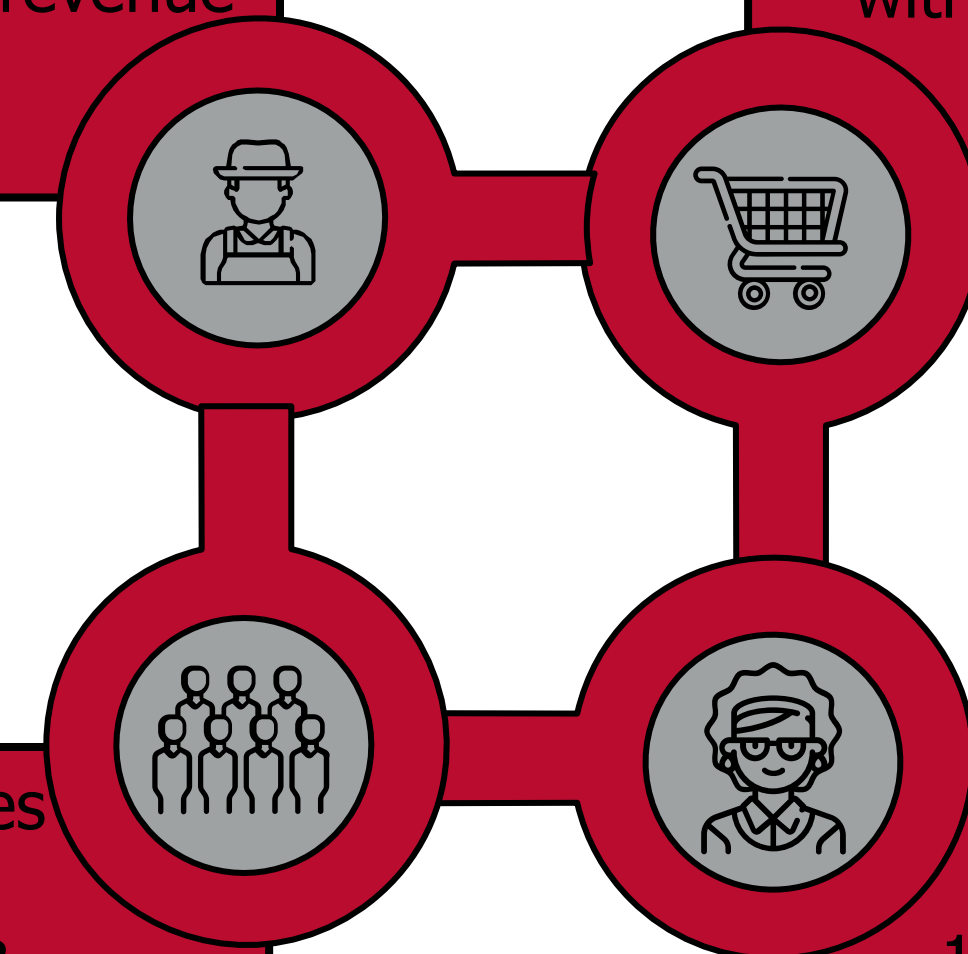


- All components are mounted on a portable aluminum extrusion frame allowing for modular positioning of each component. All electrical components are powered by a single 240v, 50 Amp power cord and subpanel.

Impact

Farmers now have the opportunity to explore more profitable revenue streams.

Local markets & farm stores provide farmers with a direct channel to retail



Rural communities see increase in economic value & opportunity to engage younger generations

Retail sales allow farmers to see a 1500% increase in revenue/lbs compared to wholesale

