Design Status

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Phase 6: Service / Maintenance	**Status:** *To be done** **Semester:**	
Phase 5: Delivery	**Status:** *To be done** **Semester:**	
Phase 4: Detailed Design	**Status:** *To be done** **Semester:**	
Phase 3: Conceptual Design	**Status:** *In Process* **Semester:** *Fall 2017*	
Phase 2: Specification Development	**Status:** *Completed* **Semester:** *Fall 2017*	☑
Phase 1: Project Identification	**Status:** *Completed* **Semester:** *Fall 2017*	☑

*Note : Identify which of the three (Completed/ In Process/ To be done) your project is in.

Project Plan

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Gantt Chart
Fall 2017

						Week											*Note: Date Listed is Friday of Week
	8/25	9/1	9/8	9/15	9/22	9/29	10/6	10/13	10/20	10/27	11/3	11/10	11/17	11/24	12/1	12/8	
Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Establish Teams																	
Establish Communication																	
Finalize List of Requirements																	
Order Bee Prototype						X											
Mid Semester Design Review & Prep																	
Submit Design Document						X											
Complete Design Review Slides							X										
Research																	
Brainstorming																	
Concept Convergence																	
Design Hive																	
Research Monitoring Options																	
Build Prototype																	
Set up Monitoring System																	
Send Prototype to Mines																	
Final Design Review & Prep																	
Submit Design Document															X		
Complete Design Review Slides																X	

Project Identification

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Description of the Community Partner

The EPICS Lakota team is partnered with students at South Dakota School of Mines and Technology (SDSMT) and Oglala Lakota College (OLC). Together, the three schools will work to address food security issues facing the Lakota people on and around the Pine Ridge Reservation in South Dakota.

We are also partnered with the Thunder Valley Community Development Corps (TVCDC). TVCDC's mission is to "empower Lakota youth and families to improve the health, culture, and environment of our communities through the healing and strengthening of cultural identity". They believe in "creating systemic change to address root causes of poverty by creating an ecosystem of opportunity". One of their initiatives under food sovereignty is a Small Demonstration Farm. This farm will serve as a model and education center at TVCDC and will include a greenhouse, poultry unit, and bees. In addition to serving as a model and hands on learning experience, TVCDC hopes this demonstration farm can be scaled and brought to various communities on the reservation. This will help improve access to local and healthy foods as well as empower community members with information about the health, environmental, and economic benefits of supporting local food systems.

Stakeholders

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Project:	Bee Box
#	Stakeholder
1	Nick Hernandez
2	Pine Ridge Reservation
3	Thunder Valley

Social Context

The USDA defines a food desert as an area where "either a substantial number or share of residents has low access to a supermarket or large grocery store". With limited access to grocery stores comes limited access to fresh fruits and vegetables, high quality grains, and other nutritious food. In addition, lack of competition means food venders in these areas can charge disproportionately high prices for the food they do provide – groceries sold in food deserts can cost an average of 10% more than groceries in suburban markets. With higher prices and lower quality of food, food deserts are also home to a wide variety of diet related health problems including diabetes, cardiovascular disease, and chronic illness, all of which can lead to lower life expectancies.

The three counties that make up the Pine Ridge Reservation – Oglala Lakota (formerly Shannon), Jackson, and Bennett – are three of the poorest counties in the United States. Approximately 80% of the population of Pine Ridge has limited access to stores and many in Rapid City, home to OLC's He Sapa campus, face similar issues. The Lakota team, with our partners at Mines and OLC, hope to assist these communities in combatting these issues.

We are also partnered with the Thunder Valley Community Development Corps (TVCDC). TVCDC's mission is to "empower Lakota youth and families to improve the health, culture, and environment of our communities through the healing and strengthening of cultural identity". They believe in "creating systemic change to address root causes of poverty by creating an ecosystem of opportunity". One of there initiatives under food sovereignty is a Small Demonstration Farm. This farm will serve as a model and education center at TVCDC and will include a greenhouse, poultry unit, and bees. In addition to serving as a model and hands on learning experience, TVCDC hopes this demonstration farm can be scaled and brought to various communities on the reservation. This will help improve access to local and healthy foods as well as empower community members with information about the health, environmental, and economic benefits of supporting local food systems.

User Needs

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Project:	Bee Box	
Need #	User Need	Stakeholder
1	*Must maximize the honey yield*	*User*
2	*Needs to be cheap*	*User*
3	*Needs to be easily repaired*	User
4	*Needs to be able to handle the harsh weather*	User
5	Needs to have a set of instructions	User

Project Objectives

Our objective is to help solve the need for food on the Pine Ridge Reservation in South Dakota. This area has a need for food, and by building bee hives, this will help maintain the bee population for growing foods, along with providing honey to the local people. This production of honey could also grow and become a way to boost the local economy.

Outcomes/Deliverables

Our final project will be functioning bee boxes that fit the user needs. We will also create a set of instructions for the bee boxes so that they can be used and repaired easily. When the project is finished, we hope to supplement the bee population and leave behind an easy way for the Pine Ridge residents to easily get honey.

Specification Development

Benchmarking/IP

There are many solutions to fix the community problem. There are countless companies that sell bee boxes that would work for this problem. However, these products are expensive and some are patented. So, they will not be able to build them on their own, with local materials. A couple boxes that they have used in the past have been from Dadant and Honey Flow. The box from Dadant is a standard bee box that will be similar to what we will be designing. The Honey Flow box was a specialized box designed to maximize the amount of honey collection without having to open the box. These boxes did not work for our community partner. So, we can compare our solution to these products because these are commercial bee boxes. During our design we will have to overcome quite a few intellectual barriers. Some patents out there for bee boxes include the Langstroth hive, the flow honey, and many other patents for the different parts and designs of the boxes. To further the point that the box we design needs to be able to be produced with local materials and people on the reservation can build they do not want us to patent it. They want to be able to share this with whoever, so that their community can flourish with honey.

Specifications

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Project:	Bee Box		
Need #	**User Need**	**Spec #**	**Specification**
1	*Maximize Honey Production*		
		1.1	*Get the most honey out of each hive*
2	*Produce locally and easily*		
		2.1	*Use local materials when possible*
		2.2	*Simple construction process*
3	*Able to withstand elements*		
		3.1	*Withstand extreme temperatures*
		3.2	*Withstand wind*
		3.3	*Withstand hail the size of baseballs*
4	*Develop instructions to build and maintain*		
		4.1	*Make a video or manual with simple step by step instructions for construction*
		4.2	*Create informational documents surrounding the maintenance of bee boxes*