

Moving Beyond Behavioral Intentions: Using TAM to Design Software for Beekeepers and Measure Adoption Rates

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Motivation

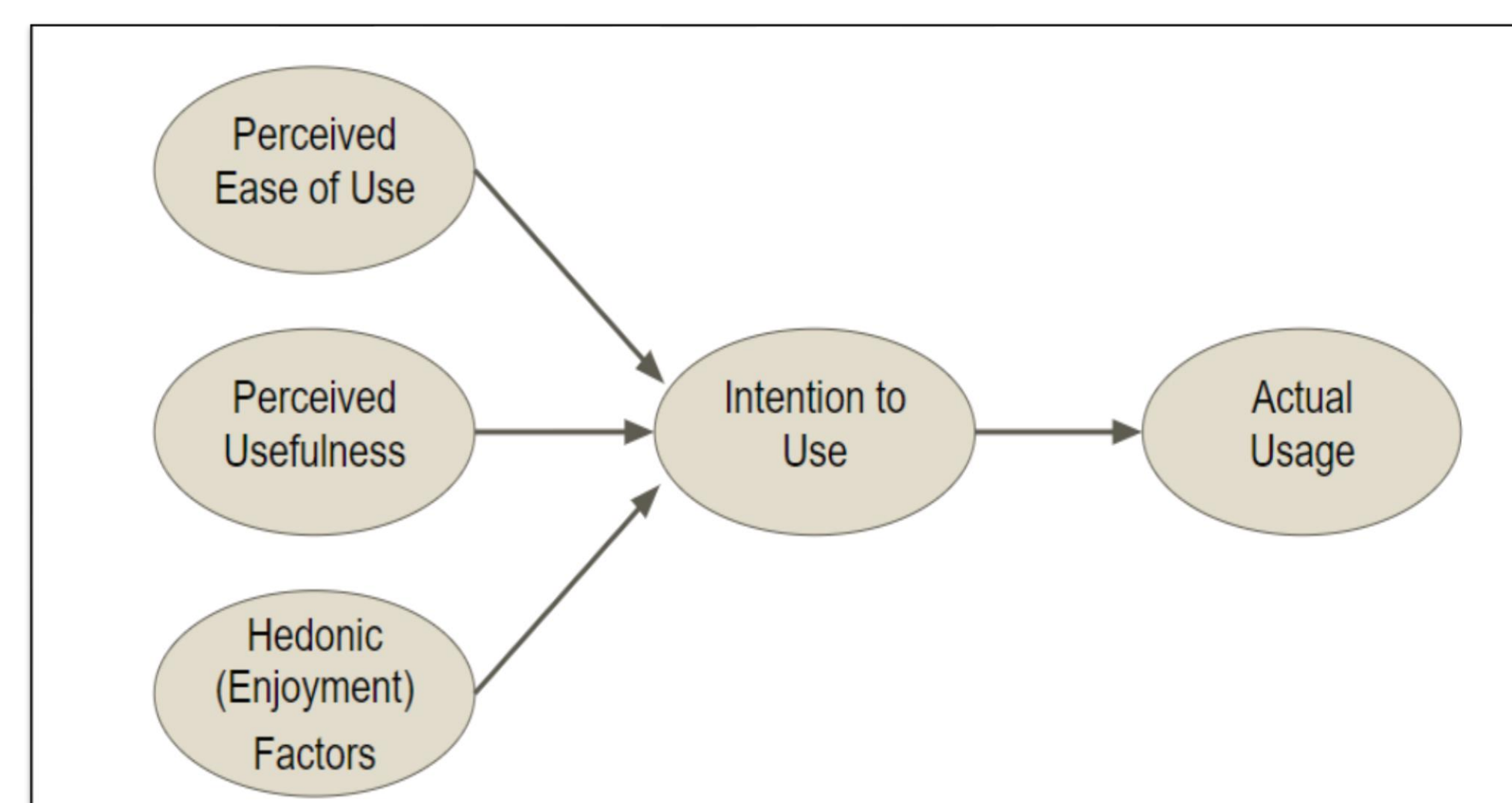
- **Bees are in trouble.** Over the last decade, beekeepers have experienced significant annual losses in their bee populations.
- **Bees Are Important to Humanity.** Bees are the primary pollinators of cultivated crops. In fact, one-third of all global agriculture relies on pollination from bees.
- **Technology can help.** Examining related industries, we can see several advantageous opportunities for impacting bee health including data collection, good data management, external data integration, and analysis of data.
- **Beekeepers have been slow to adopt new technologies.** This makes beekeepers an ideal group to test the theories of adoption and diffusion of technology because they are, as a group, at the very beginning stages of adopting new technologies to help care for their bees.

Objectives

- Study actual adoption rates of software for beekeepers using before and after acceptance rates of the original software and a new version redesigned according to key principles from the **Technology Acceptance Model (TAM)**.
- Provide recommendations to improve software adoption rates based on analysis of user feedback gathered from surveys.

Technology Acceptance Model (TAM)

TAM is a derivation of the Theory of Reasoned Action, customized for the prediction of information technology (IT) adoption and use.



Methodology

Our research partner, *Hivetracks.com*, the leading software provider to beekeepers, provides all of the data to study actual and perceived adoption rates from beekeepers.

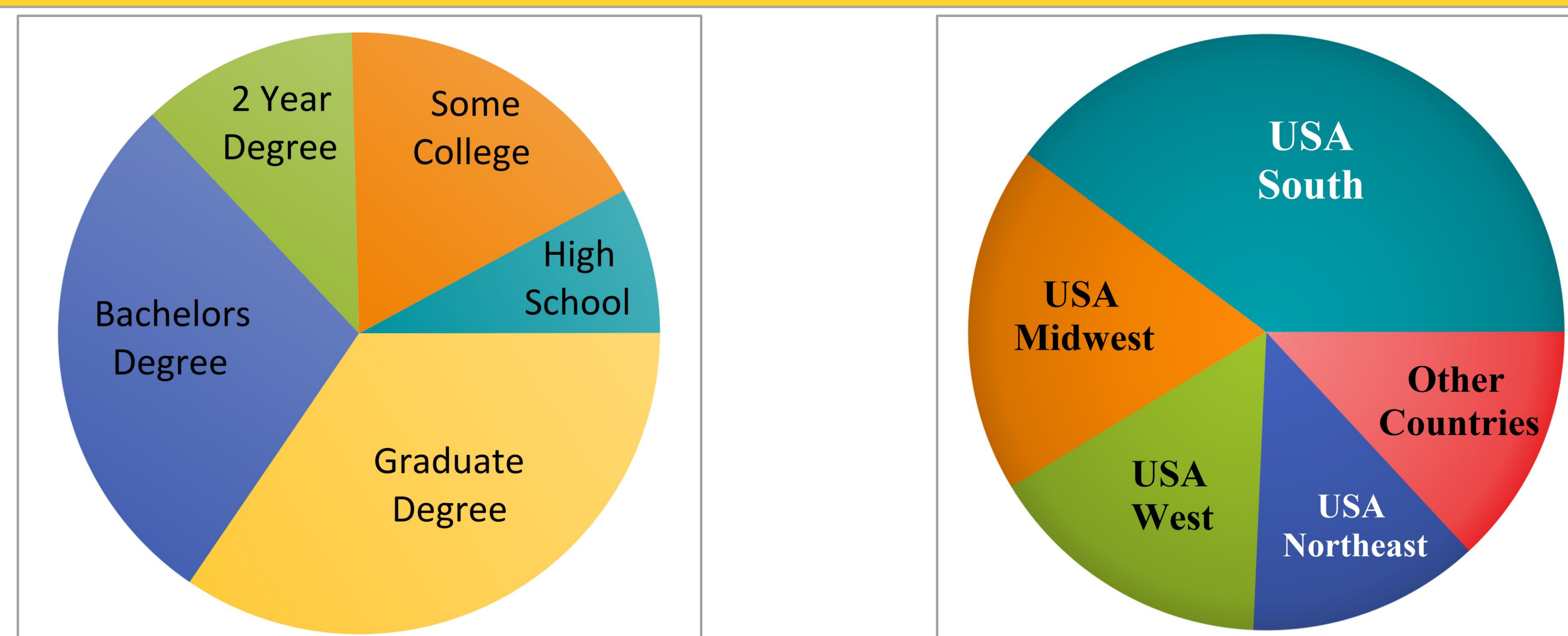
In March of 2018, Hive Tracks sent out a online survey before rollout of the new version redesigned according to key principles from the TAM. The survey asked a total of 25 questions, including scale based questions and open-ended comments for user perceived ease of use, usefulness, enjoyment, and future use along with demographic related questions.

Survey Percent Distribution of Average Scores by Category

(1 Strongly Disagree --- 7 Strongly Agree)



Survey Demographics



Survey User Feedback

Comment Category	Percentage
Hive Tracks is too expensive	27%
Hive Tracks is a great product	20%
App is difficult to use in the field	10%
App should have same functionality as the site	9%
Need tutorials or manual	6%

Recommendations

- **The software needs to provide insights.** Hive Tracks is focused on data collection and data collection is only useful if the user can pull insights from the data.
- **Create a free version**, that will expand the market to gather more valuable data that can be used in research and providing intelligence to aid beekeepers in the care of their hives.
- **Promote a citizen science program**, to take advantage of passionate hobbyists who are well educated.

Moving Forward

The next steps for this research project include:

- **Quantifying actual usage**, by using the data stored from Hive Tracks.
- **Extend TAM by connecting the perceived intention to use the software to actual usage**, by measuring before and after usage compared to their previously measured intention of use.
- **Conduct and analyze additional surveys** after the rollout of the new version redesigned according to principles from the TAM.

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Figure 2. Adoption of the Technology Acceptance Model