



intuit®

TECH  
INNOVATION  
CHALLENGE

---

TEPPER SCHOOL OF BUSINESS

TEAM ANMT  
MARLO ABRAMOWITZ  
VEDIKA NARAYANAN  
REBECCA MOURA  
SAMANTHA TRAN

## The Customer

For small businesses, effective cash flow management and working capital are critical for business survival.

A key element of cash flow management is accounts receivable management. On average, small businesses have 27 days of cash flow reserves and take 21 days to get paid, with 81% of unpaid invoices at 30 days past due (JP Morgan).

**The longer receivables go uncollected, the less likely they are ever to be collected.**

Having a cash collection strategy is essential. Customers with overdue balances typically fall into one of the following categories:

- Have financial issues but typically pay on time
- Spread out their payments due to having many payments due at once
- Avoid paying altogether

It is crucial for small businesses to categorize late-paying customers and strategize accordingly.

Currently, businesses using Quickbooks can invoice customers and track payments and balances. The “Reminder” tool in Quickbooks automates email reminders to customers. If balances remain unpaid, an employee will typically need to follow up with a collection call, and in many cases, multiple unpleasant calls. In the worst cases, small businesses outsource to a collection agency or end up writing off the balances altogether. The collection process is time and labor-intensive.

By leveraging AI/ML, we designed a human-centered solution to streamline accounts receivable management to optimize cash flow.

# 82%

of small businesses fail  
due to cash flow  
problems

## The Market

As chat and voice assistants become ubiquitous, customers expect to interact with companies through Customer User Interface (CUI) tools, and continue to demand more personalized connections. **Sentiment Analysis is a powerful advancement in this space.** By leveraging AI, chatbots and voice assistants are able to analyze and manipulate the tone of a message to offer better customer engagements. Intuit is already creating a speech recognition software with these capabilities - Mumbler.

These advancements are not being leveraged within competitor's tools today. Current offerings primarily depend on the business creating a standardized email reminder to send to their customers at the same time each month. This is the trend across all Intuit competitors that we have seen (including Wave, Freshbooks, and Sage), and is already part of the core offering of QuickBooks.

Through this process there is no option to know when to send an email, or what message will be most effective. Mumbler's user sentiment analysis and AI technology will allow Intuit to fill this gap - **reducing the burden on small businesses** and providing unparalleled customer experiences.

# Introducing Tilly

A smart and humanized CUI designed to give businesses time (and money) back



## The Product

We've designed Tilly to:

**Automate** the collection call process using a voice assistant CUI, and use sentiment analysis to gain insights on the customer and personalize the call

**Accurately predict** customer behavior and dynamically manage customer credit risk, using machine learning and data analytics

Tilly will have the following features:

- **Machine learning and data analytics** to create a credit risk scoring framework and also determine optimal times to call the customer based on past behavior
- **Natural language processing** technology to analyze syntax, semantics, and tone to identify trends and signals associated with payment behavior
- **Negotiation abilities** and an understanding of when it's the right time to settle for a payment that is less than what is due
- **Ability to synthesize conversations** to update invoice records and send follow-up emails to the customer with the agreed upon terms.



## The Impact

**43% of small business owners cite cash flow as a main source of stress.**

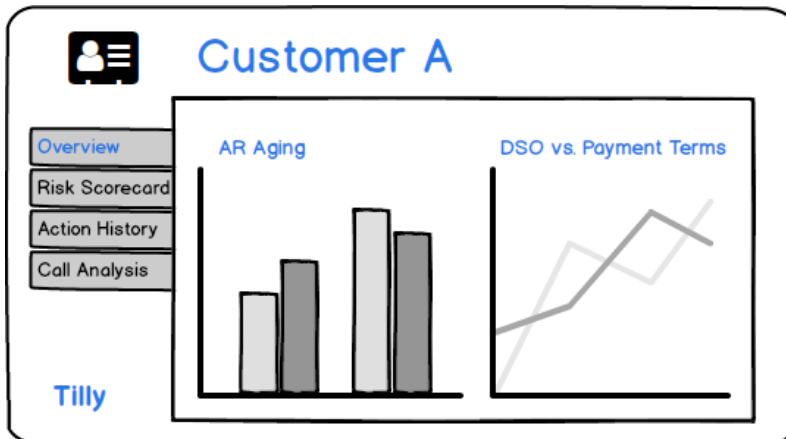
By developing this technology and integrating it into the Quickbooks product, owners will be able to focus their time on driving revenue and more efficiently collecting on aging receivables. With this added value, customer retention rates will increase.

Additionally, Intuit can add on a fee to its subscription service for Quickbooks online. With over 2 million small businesses as clients, this could generate an additional \$200-300 million in revenue per year. Tilly's capabilities could also be leveraged in other products, like TurboTax, to enhance the

This best-in-class CUI technology provides small businesses with capabilities that are usually only available to more resourced organizations. With Tilly, **Intuit will be able to develop a deeper insight into customer sentiment and obtain better data around payment patterns, thus enabling more customers to get on the path to prosperity.**

TILLY'S CALL PROCESS	STAGE		RESOURCE	RESULTS
	PRE CALL		Machine Learning Data Analytics	Developed call strategy and identify client risks
	CALL		Natural Language Processing Voice Recognition Sentiment Analysis Deep learning	Personalized & empathetic collection phone calls
	POST CALL		Data Analytics Natural Language Processing	Updated records, Scheduled follow ups, analyzed data, and developed client score

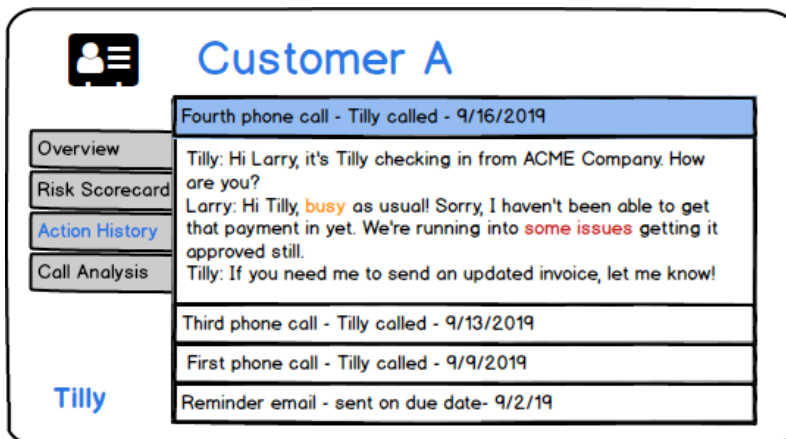
## Quickbooks &amp; Tilly Integration UI



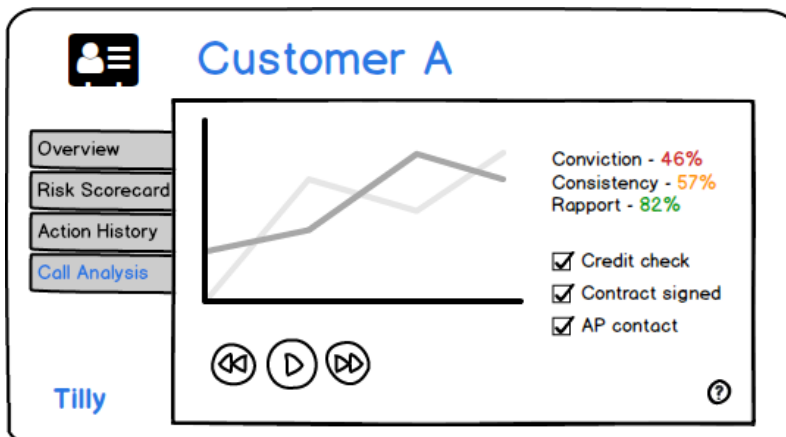
Overview



Risk Scorecard



Action History



Call Analysis