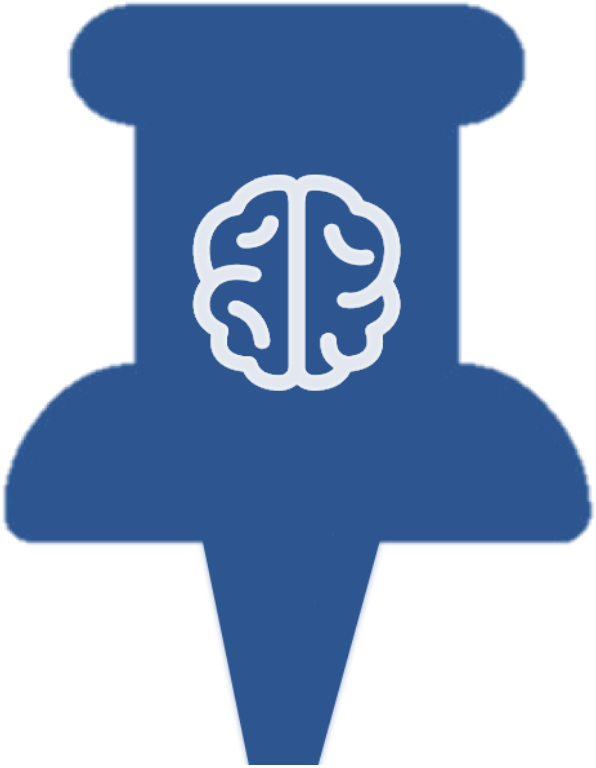
ThoughtTac Technologies



Keeping the Mind Together

1% of the U.S. population suffers from schizophrenia, and 80% of these individuals' quality of life is significantly impaired by Cognitive Impairment Associated with Schizophrenia (CIAS) for which there is no effective pharmacological treatment. Though Cognitive Enhancement Therapy (CET) has proven effective, most schizophrenia patients fall into a low-income demographic and receive care at community health clinics where they have face-to-face provider interactions for approximately ten minutes per month. This lack of accessibility leads to the progression of schizophrenia resulting in exacerbations of the disease that permanently impair cognition and result in hospitalizations that contribute significantly to healthcare expenditure. ThoughtTac Technologies addresses these problems by providing users with an integrative experience comprising of a personalized profile, uninterrupted access to gamified forms of CET, peer support through chat features, and medication adherence support via push notifications.

Schizophrenia poses a problem to all stakeholders involved in the disease. ThoughtTac Technologies provides a solution to these problems in the form of an integrative mobile-app.

Stakeholder	*Problem*	*Solution*
Patient	• CIAS is the number one contributor to decreasing quality of life among schizophrenia patients • The isolating nature of schizophrenia along with its societal stigma prevent patients from seeking assistance in managing their disease	• Easily accessible CET enables users to regularly seek therapy at their convenience • The peer support system lets users connect to other patients with their disease and communicate through text, voice, and video messages
Provider	• The individual prognosis of schizophrenia is highly variable and difficult to understand considering limited interactions with patients in community health clinics	• Constant monitoring and real-time access to patient disease status promotes effectiveness and efficiency in care
Payers	• Schizophrenia has the second highest hospital readmissions rate and contributes to 23% of Medicaid hospital expenditures	• Effective disease management can help slow the prognosis of schizophrenia and prevent psychotic episodes resulting in expensive hospitalizations
Researchers	• The etiology of schizophrenia is poorly understood, and large data sets about the prognosis of this condition are not yet available	• The creation of a disease registry enables researchers to take novel approaches to understanding schizophrenia
Pharma Industry	• Schizophrenia patients report up to 74% medication discontinuation in both inpatient and outpatient settings	• Data concerning medication adherence provides insight that enables pharma companies to generate products promoting adherence

ThoughtTac is an integrated mobile app for disease management consisting of **four main features**:

Gamified CET

- A traditional rehabilitation program that helps participants improve neurocognitive impairments
- Gamified elements that target the seven major modes of cognition afflicted in CIAS

Adherence Support

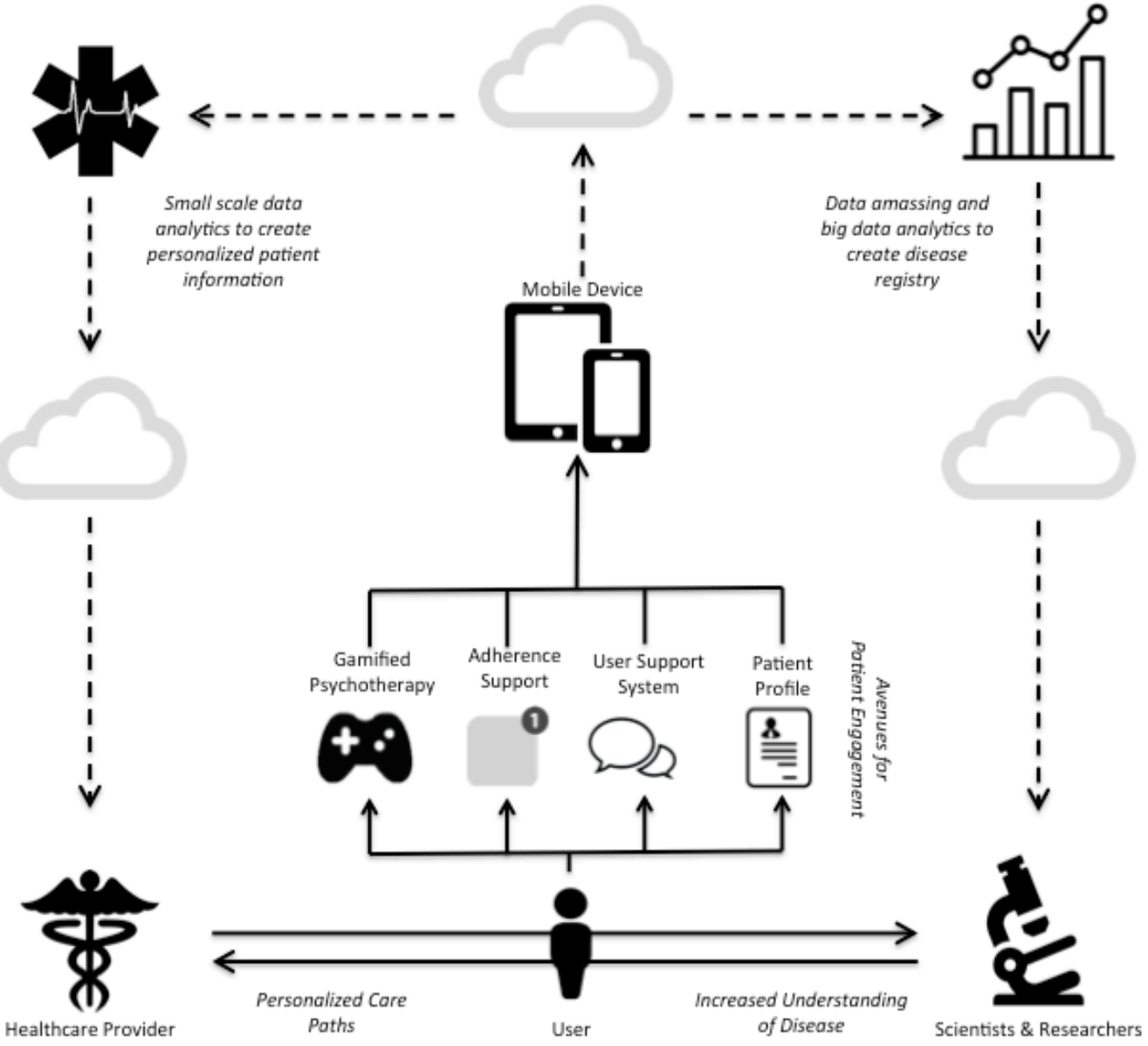
- Daily push notifications reminding users to take their prescribed medications
- Tracking of adherence patterns for data purposes

Peer Support

- Chat interface for users to participate in direct messaging or group chat rooms
- Message board for users to discuss topics of interest

Patient Profile

- Profile containing key cognitive, medical, demographic, and behavioral data (diet, smoking, symptoms)
- Cognitive data dynamically updated based upon metrics from other three features



The collection of qualitative data from user input streams, and its transformation to quantitative metrics that are then examined through both small-scale and large-scale analytics, is a **novel approach to the use of technology in disease management**

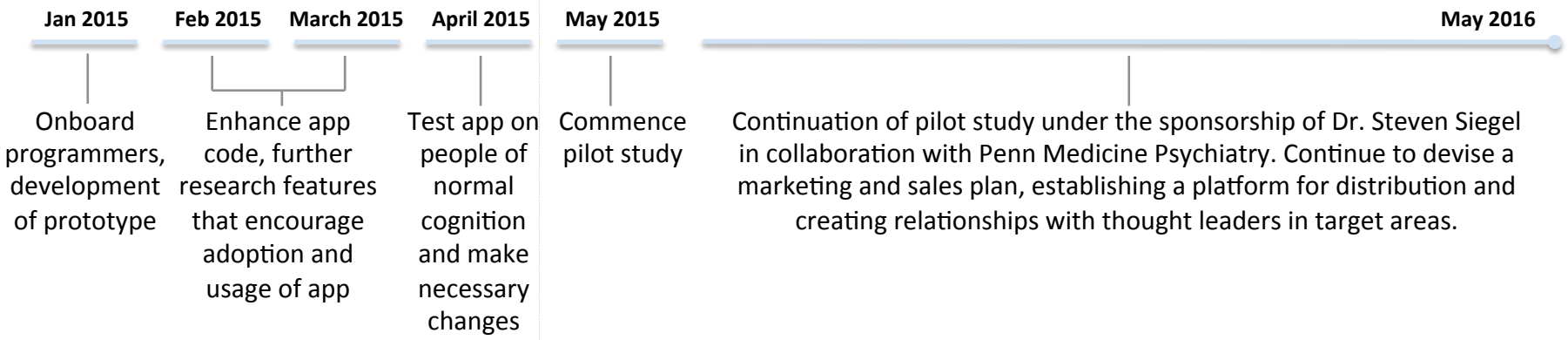
After conducting extensive primary research, speaking to industry experts in the various spheres of schizophrenia, and revision of our business model by our advisors, the ThoughtTac determined a target market based on the following segmentation

Segment	Percent of US Population	Potential Users
Schizophrenia Patients	1%	3,500,000
High functioning schizophrenia patients who are able to play an active role in disease management	20%	700,000
Schizophrenia patients who use a smartphone for health purposes	73%	**511,000**

Currently, there exists **no integrated solution that competes with ThoughtTac**'s disease management and data generation capabilities. Considerable competitors consist of companies that focus on only one of ThoughtTac's four main features and are listed in the table below.

Competitor	Description	Comparability
CrossCheck	Patients are monitored through sensors and fill out a weekly questionnaire on mood and symptoms	Patient Profiles, Disease Registry
Lumosity	Offers brain games aimed at improving cognition	Cognitive Enhancement Therapy
MediSafe	Sends patients email, text, video, or phone reminders to take their medication	Medication Adherence
Ginger.io	Use sensor data collected through phone and self-reported information to identify people who may need help	Patient Profiles, Disease Registry

Milestones for the Next 6-12 Months



Initial Funding Needs	
Pilot	$75,000
Patent and Legal	$3,000
Development	
Developers/designers	*2*
Hours/developer/year (avg)	*300*
Rate/hr	*$110*
	$66,000
Total Costs	**$144,000**

Collaboration

- Partner with **Penn Medicine** and leverage their extensive schizophrenia **customer base**, their **current data**, and their **research facilities**

Methods

- **One year** study including **50 to 100 schizophrenia patients** currently undergoing treatment
  - Employ various test groups and a control
    - **Control Group**: Medication Only
    - **Group 1**: Medication and Ebilify
    - **Group 2**: Medication and Psychotherapy
    - **Group 3**: Medication. Psychotherapy, and E-bilify

Metrics

- User and provider satisfaction
- Usage patterns
- Improvement in baseline cognition levels and baseline symptoms
- Medication adherence patterns
- Hospital readmissions

End Points

- Establish **proof of concept**
- Determine value as adjunct to medication, psychotherapy, and the combination of the two
- Determine whether app can be employed as a cost-effective replacement for traditional psychotherapy

Management Team

Beatriz Gadala-Maria, *CEO*, UPenn SAS'15, studies Biological Basis of Behavior and Health Care Management. She has industry experience in neuropsychopharmacological research, healthcare IT, and life sciences consulting.

Chetna Johri, *Software Lead*, UPenn SEAS/ Wharton'16, studies Bioengineering, Health Care Management, and Math. She has a background in MATLAB, JAVA, healthcare IT, and life sciences consulting.

Kinjal Shah, *R&D Lead*, UPenn SEAS/ Wharton'16, studies Bioengineering and Operations & Information Management. She has a background in point-of-care diagnostics research, market research, and health policy.

Marcela Argüello, *Business Development Lead*, UPenn Wharton'15, studies Finance, Management and Operations. She has experience in the financial industry and executing business development for a Fortune 100 company.

Board of Advisors

Steven J. Siegel, MD, PhD, Professor of Psychiatry, Director Translational Neuroscience Program, Director Clinical Neuroscience Track, is a practicing psychiatrist specializing in the treatment of schizophrenia.

Chuck Peipher, MBA, spent 20+ years in pharma and launched the most successful schizophrenia drug to date. Mr. Peipher recently founded a commercial development consulting firm focused on the neuroscience therapeutic area.

Dr. Nick Dewan, M.D., has 25+ years of experience in the clinical sphere, pioneering the first patient education software in behavioral health and the first PC decision support system in hospital psychiatry in the early 1990s.

Samuel Fager, M.D., M.B.A., J.D. is a practicing physician at Penn Medicine who has 20 years of expertise in health care policy from his work at the Joint Commission and profound experience in coverage and reimbursement from work in the insurance industry.