TrAceso
Stage 4 - Final Presentation -2020

Group 1
Niketan Baranwal, Sepehr Gharavi, Gausnary Decius, Charles Rinaldi, Dominic De Chavez, Nooree Choi, Chris DiVila, Yuri Gerson, Raisa Amin

Team Description

We are an independent software company who want to make an online platform to make personal medical information and doctor's visits simpler and easier.

Team Leader: Sepehr Gharavi

Project Manager: Niketan Baranwal

Presentation/documentation manager: Charles Rinaldi

Market research: Gausnary Decius

Business analysis/context modeling: Nooree Choi

Financial analysis: Dominic De Chavez

Business models: Raisa Amin

UI/UX design: Chris DiVila

Prototype development: Yuri Gerson

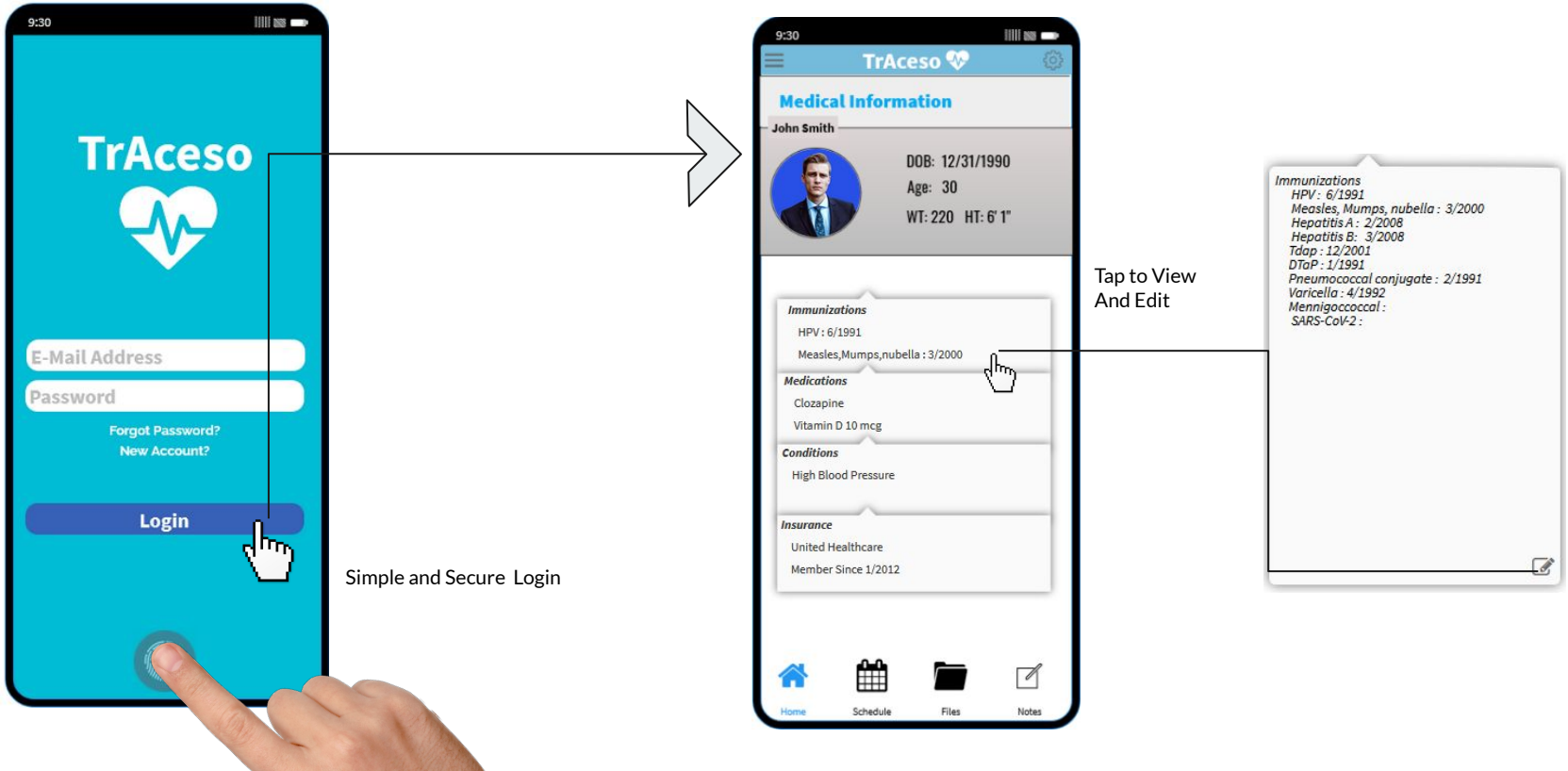
Project Description

TrAceso is a simple and secure mobile app solution to doctor and patient healthcare management. Your health, at your convenience.

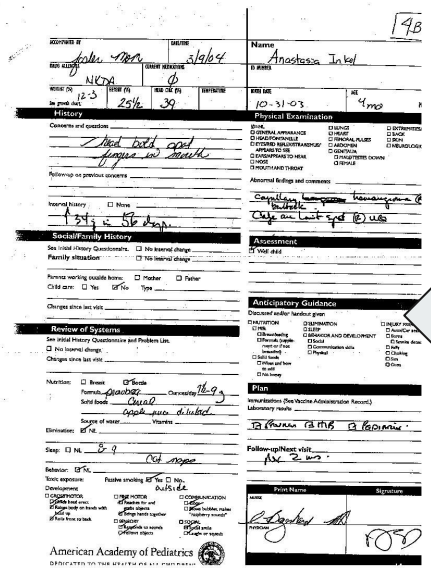
Elevator Pitch

We are **TrAceso**. We want to make the necessary process of your personal healthcare management easy and convenient, by putting it in the palm of your hand. Almost anybody can tell you how tedious it is to try to get your personal medical records when you need them. Storing and organizing these records becomes a hassle, and an intimidating blockade for a very important part of your health. Our app makes the process of planning and organizing your medical profile simple, efficient, convenient, and secure. With our app, both doctors and patients can access important medical documents, plan appointments, update patient medical history, and more. Your health, at your convenience. TrAceso.

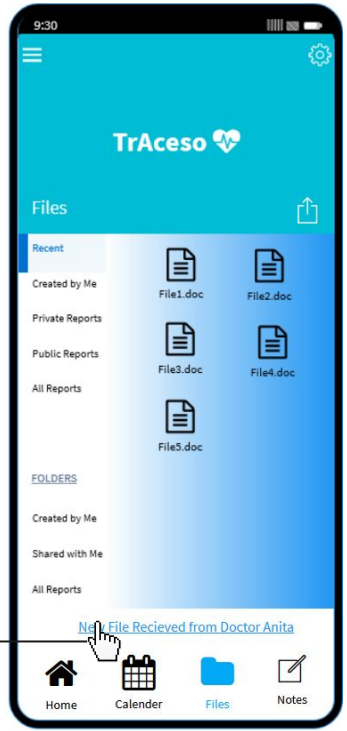
High Fidelity Prototype - Demonstration

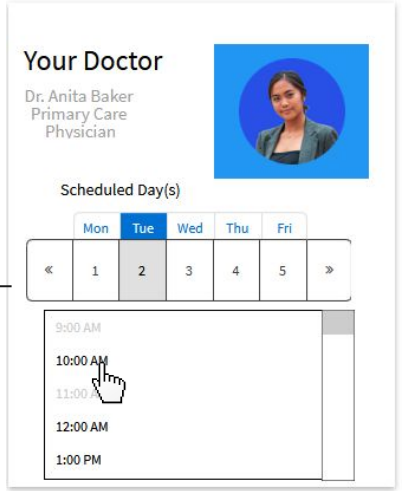


High Fidelity Prototype - Demonstration



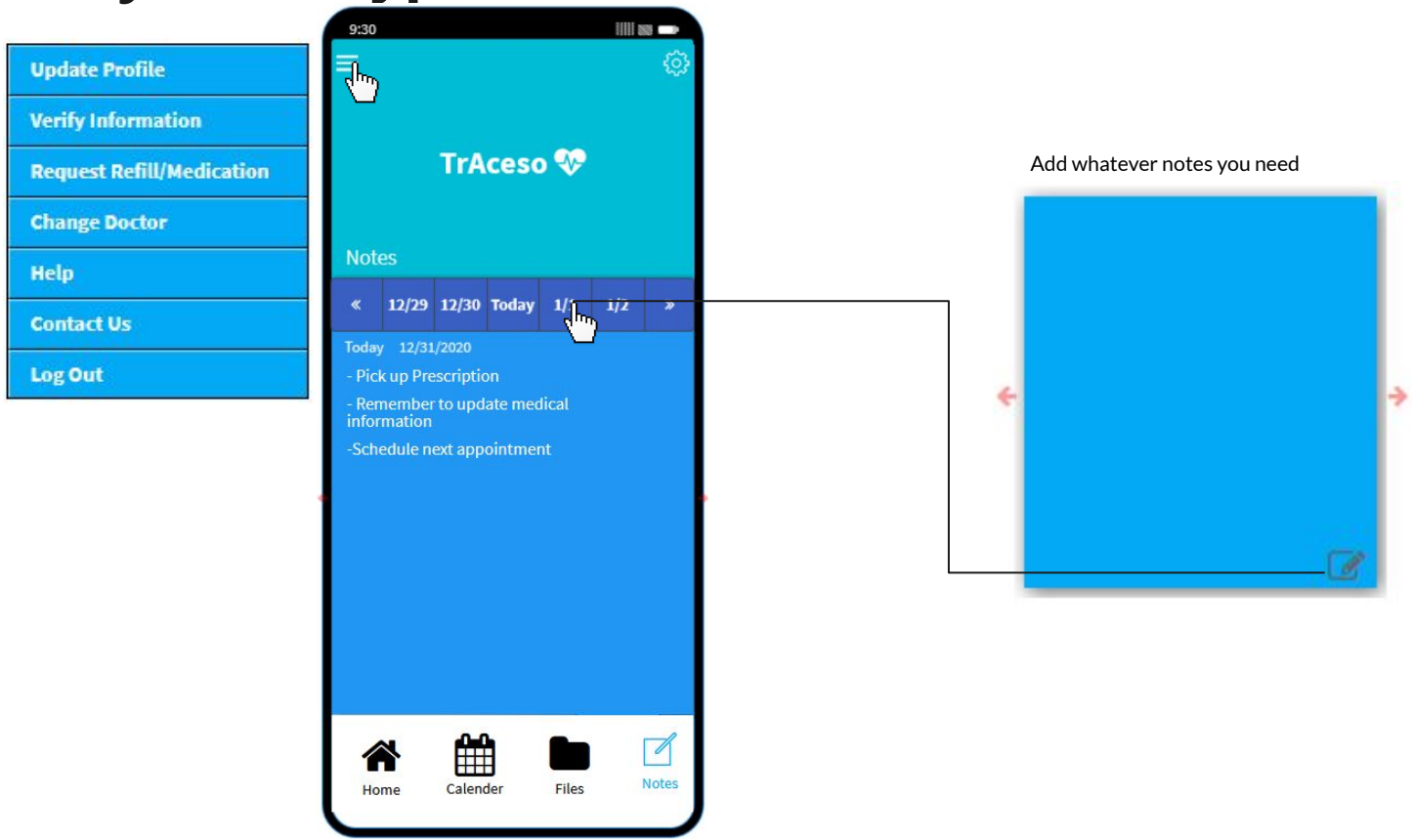
Files Right After Checkup





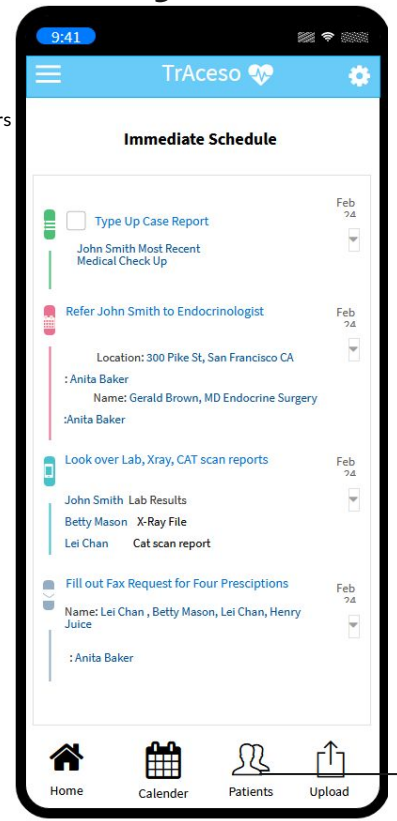
Quick and easy appointments

High Fidelity Prototype - Demonstration

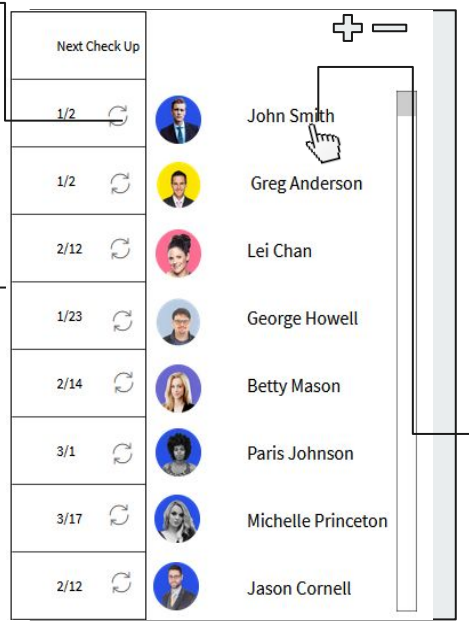


High Fidelity Prototype - Demonstration

Slightly Different Layout for Doctors with Emphasis on Schedule and Patient Information



Send Email Reminder



Click to view profile or send FIles

Lessons Learned

- Learned that making medical information easier to access requires a lot more security and privacy than we initially thought it would.
- Realized that a lot of applications like TrAcesso already exist but after research, we realized that they do not have every feature that patients/doctors may want/need.
- Learned that HIPAA Compliance is necessary in order for our app to be successful.
    - Also learned that gaining HIPAA Compliance can take a lot of time and money which we did not initially account for.

Stakeholders

- Patients/Guardians
- Doctors/Physicians
- Receptionists

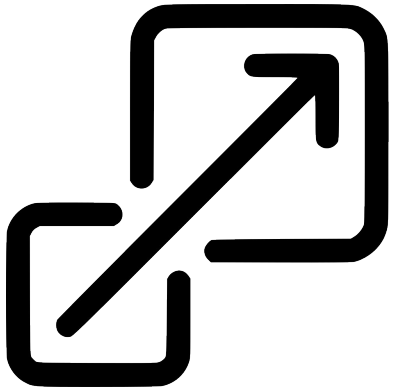
- Insurance Companies
  - Medicaid
  - Medicare
  - Horizon
  - Amerihealth
- Pharmaceutical Firms
- Other Hospitals
- Possibly Government

Customers/Target Audience

- **Primary Target Audience**: Patients and Doctors
  - Hospitals, Pharmacies
- **Who will benefit:** Patients and Doctors
  - Patients: online medical history, search for Doctors
  - Doctors: gain more patients
- **Who will use our Product**: Patients, Guardians, Doctors and Receptionists

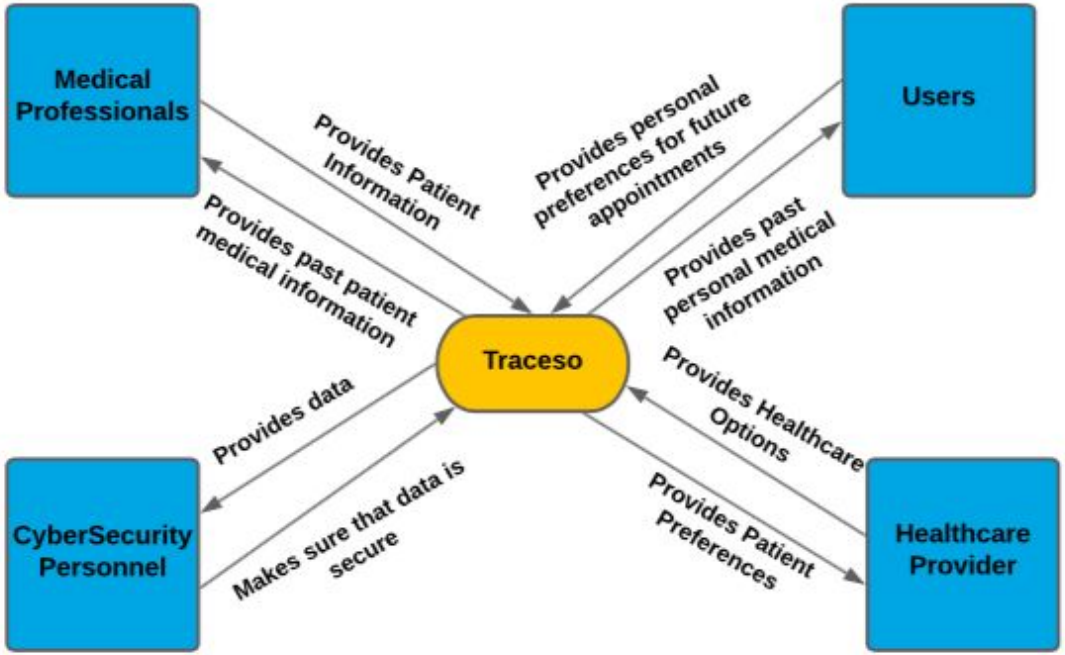
Scope

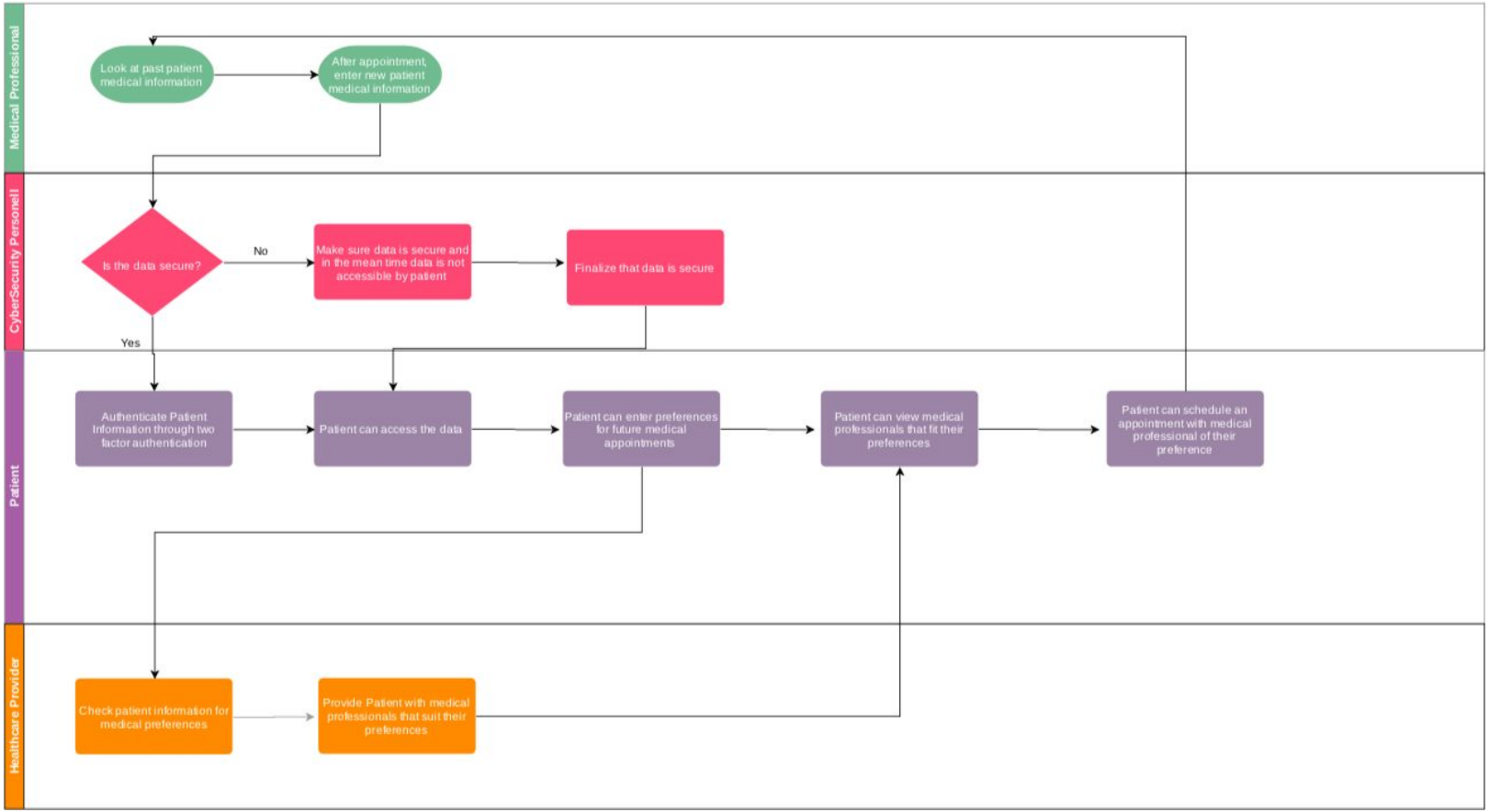
- Initially exclusive to New Brunswick
  - Allows for intimate understanding of what is needed
- Scalable
  - Solution that can later be applied to audiences outside the counties and states
  - Application serves as a frame that takes in facility-specific information



Included	Excluded
- Platform: Website and mobile application for iPhone	- Android Application
- HTML, CSS, Xcode	- Regions outside of US
- Secure patient information portal	
(Patients can upload documentation for approved access)	

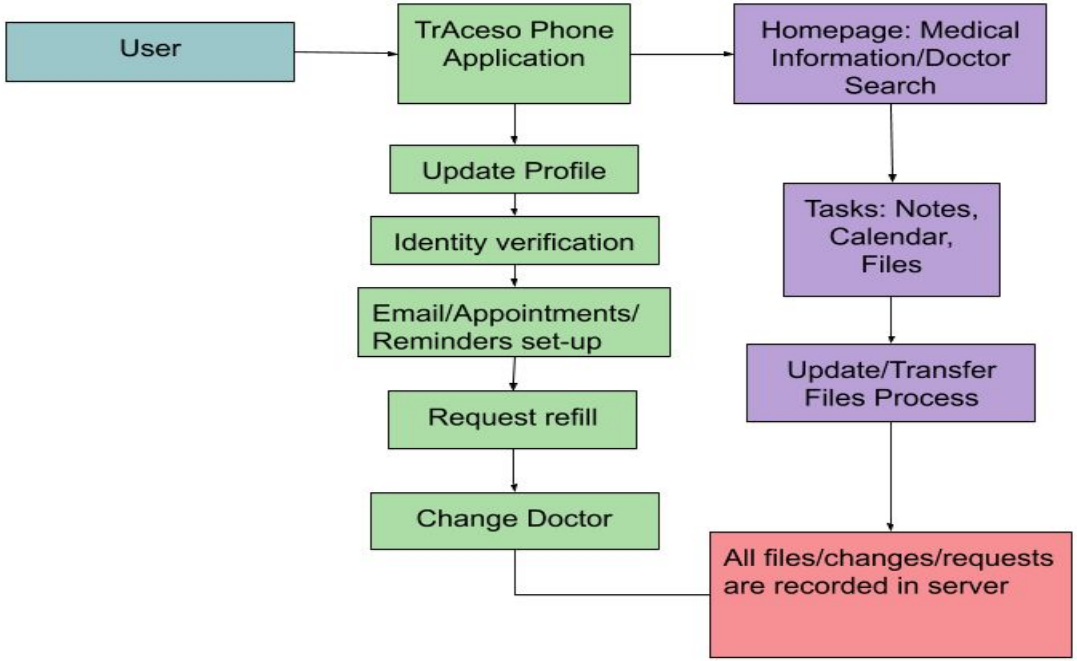
Context Diagram





Cross Functional Flow Diagram

High Level IT Architecture Diagram



Market Research - Primary

Features wanted by Potential Users:

- Personalized Login
- Contact a Doctor
- Schedule/View Appointments
- View who accessed your profile
- Security/Privacy Features
- Multi-factor Authentication

Interview with Riverside CEO:

- Thinks that patient to doctor communication would be a great addition to their current system
- Thinks that looking at past medical information would be risky but can be possible with proper security
- Thinks that our application would be innovative and would make patient to doctor communication a lot more accessible and easier for both patients and doctors.

Market Research Findings - 2˚ Market Research

Why does the business/market want this?

- Patient communication and engagement growth for better user experience
- Ease of accessibility of information for both patients and healthcare providers
    - Electronic health records, medical records
- Features with high focus in operating systems, softwares and processors
    - Diagnosis through symptoms
    - Medical calculators

How many people/businesses of what type? How do we know?

- Healthcare providers
- Insurance companies

What other solutions and technologies already exist?

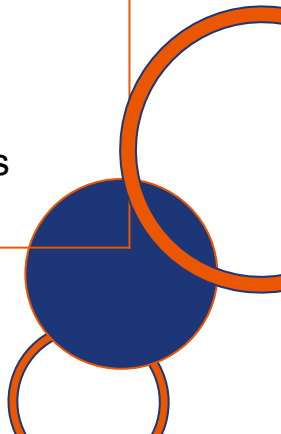
- Lybrate
- Medibabble
- Pepid

https://www.digitalauthority.me/resources/healthcare-app-development-ultimate-guide/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4029126/

Strengths	Weaknesses
● Remote Access ● Easy to schedule appointments ● Find referrals ● Contact medical staff	● Security ● Data Privacy ● Misdiagnosis (online meetings with doctors)
Opportunities	**Threats**
● Able to add new digital features (Video Call, Remote Patient Monitoring, and online chat ● Alliances with medical providers ● Reach out-of-state users, possibly foreign countries	● Lack of User Knowledge ● Server Failures ● No WiFi / No mobile data ● Costs ● Other Patient Portal apps/websites

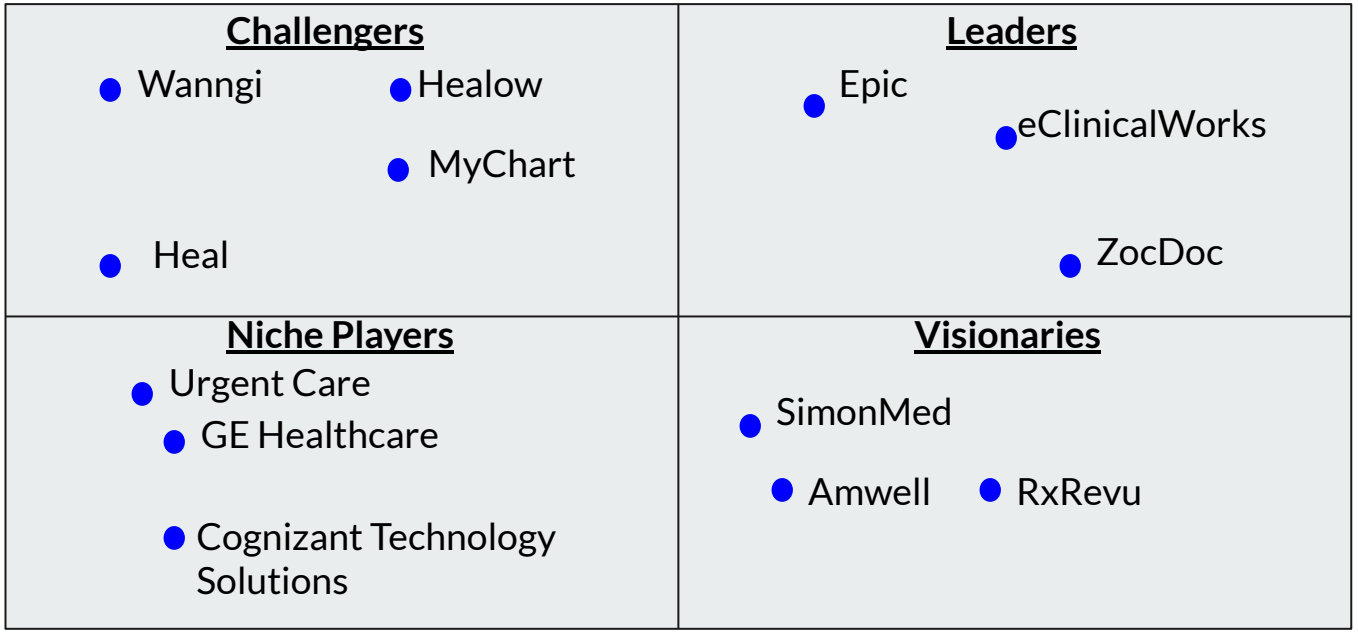
SWOT ANALYSIS



SWOT Conclusion

- Build on our strengths
  - Keep satisfying users with remote medical services
- We need to mindful of Security Breaches and Data Privacy
  - Have backup plans for security breaches and leaked info
- Work towards our goals and welcome opportunities along the way
  - Alliances and Partnerships
- Be mindful of external threats that are not in our control
  - Create backup plans
- Be wary of competition

Magic Quadrant



Magic Quadrant Conclusion

- There are many competitors with the Healthcare IT field that have created similar applications within different scope areas.
    - Wanngi, Heal, and MyChart are some of the companies that give us the most competition since they have developed a similar application that can be sold to various different medical companies.
- We have to use the competition to see what they aren't doing so we can make our application more appealing to investors and buyers.
    - Using their applications as a base model helps us understand what people are looking for and what people do not have that we want to be able to include.
- So in a sense, our company falls under the visionary area of the magic quadrant since we have a vision for a different future within eHealth that we have developed and are trying to make better each and every single day.

Ethics, Privacy, and Security Concerns

- Storage and transferring of ePHI (electronic Personal Health Information)
- Maintaining privacy/confidentiality
  - Most information is inherently identifiable
- HIPAA Compliance
- Ensuring secure access on user's end
  - Not just server access but also physical device use
- Unwanted viewing/tampering of documents
- Physical data storage/security (data center)

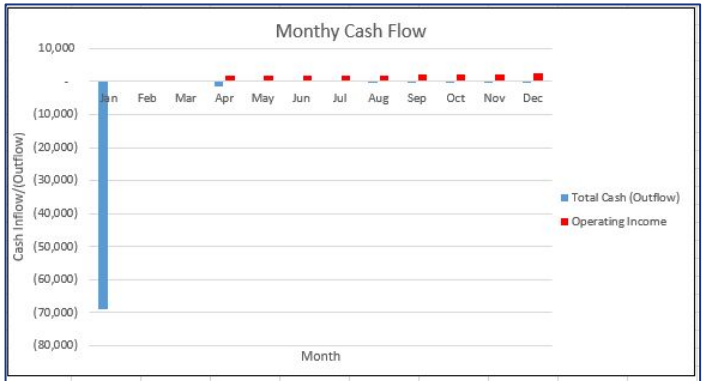
Ethics, Privacy, and Security Solutions

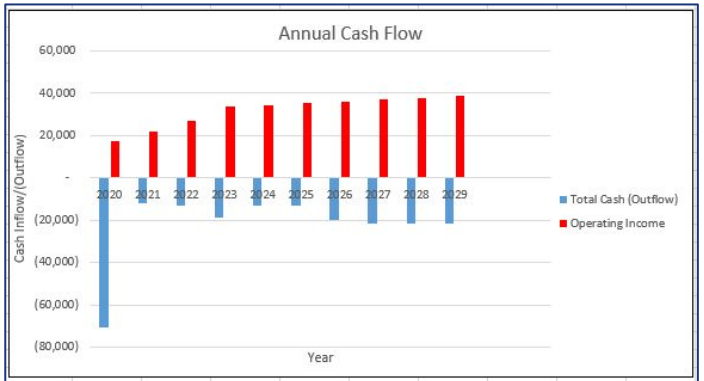
- Logging of any ePHI access/transferring
  - Readable and accessible to the owner of the information
- Establishing contingency plans for potential ePHI exposure
- Encryption/Decryption algorithm for transfer of information
  - DE4MHA
- Biometrics
  - Pre-existing mobile fingerprint/facial recognition
- Security guidelines as proposed by Xcertia (AMA Nonprofit)
- Investing in our own physical data center

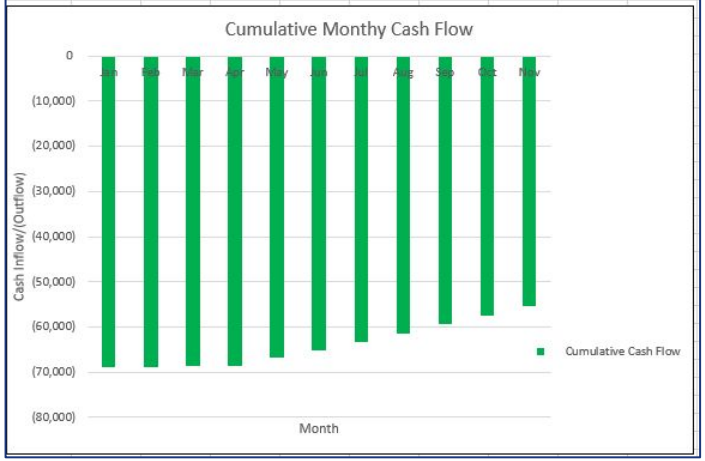
Financial Analysis

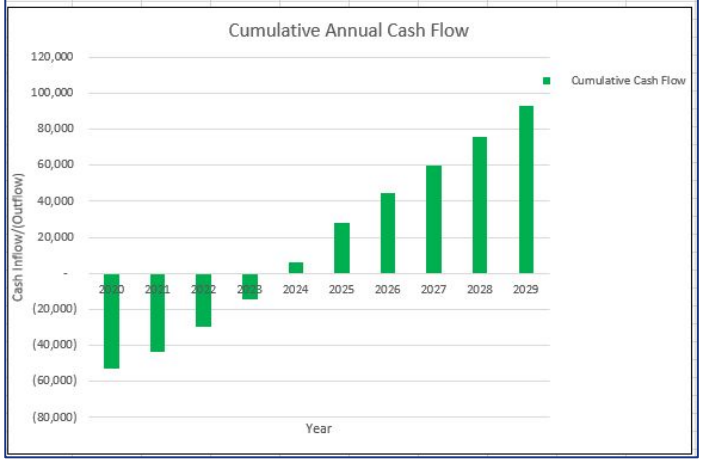
- IRR for the first year to be **-16.54%**
- Expect to have net cash flow positive after the fifth year
- IRR after 10 year period to be **24.67%**

Financial Analysis









Financial Analysis

Return on Investment Model - Simplified			Project	TrAceso									
Discounted Cash Flow Analysis													
Internal Rate Of Return													
Category		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Development Expense		50	50	50	50	50	50	50	50	50	50	50	50	600
Development Expense		(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(1,200)
Capital Equipment		(72,000)	-	-	-	-	-	-	-	-	-	-	-	(72,000)
Development Other		3,225	100	100	100	100	100	100	100	100	100	100	100	4,325
Total Cash (Investment) Each Year		(68,825)	50	50	50	50	50	50	50	50	50	50	50	(68,275)
Working Capital Impact	days													
(Incr)/Decr Accounts Receivable (CF)	60	-	-	-	(833)	(854)	(876)	(897)	(942)	(989)	(1,039)	(1,117)	(1,201)	(8,748)
(Incr)/Decr Inventory (CF)	140	-	-	-	(1,244)	(1,276)	(1,307)	(1,340)	(1,407)	(1,477)	(1,551)	(1,668)	(1,793)	(13,064)
Incr/(Decr) Accounts Payable (CF)	55	-	-	-	489	501	514	526	553	580	609	655	704	5,132
Other		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Working Capital Impact on Cash		-	-	-	(1,589)	(1,629)	(1,669)	(1,711)	(1,797)	(1,886)	(1,981)	(2,129)	(2,289)	(16,680)
Total Working Capital impact on Cash Each Month		-	-	-	(1,589)	(40)	(41)	(42)	(86)	(90)	(94)	(149)	(160)	(2,289)
Total Cash (Outflow)		**(68,825)**	**50**	**50**	**(1,539)**	**10**	**9**	**8**	**(36)**	**(40)**	**(44)**	**(99)**	**(110)**	(70,564)
Cash Inflow From Sales														
price & cost escalation						*2.5%*	*2.5%*	*2.5%*	*5.0%*	*5.0%*	*5.0%*	*7.5%*	*7.5%*	
Sales		$0	$0	$0	$5,000	$5,125	$5,253	$5,384	$5,654	$5,936	$6,233	$6,701	$7,203	52,490
Cost of Goods Sold		-	-	-	3,200	3,280	3,362	3,446	3,618	3,799	3,989	4,288	4,610	33,593
Gross Profit		-	-	-	1,800	1,845	1,891	1,938	2,035	2,137	2,244	2,412	2,593	18,896
		#DIV/0!	#DIV/0!	#DIV/0!	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Other "Direct" Variable Costs														
Freight					-	-	-	-	-	-	-	-	-	-
Commissions	2.5%				125	128	131	135	141	148	156	168	180	1,312
Other						-	-	-	-	-	-	-	-	-
Operating Income		$0	$0	$0	$1,675	$1,717	$1,760	$1,804	$1,894	$1,989	$2,088	$2,245	$2,413	$17,584
Net Annual Cash Flow		**(68,825)**	**50**	**50**	**136**	**1,727**	**1,769**	**1,812**	**1,858**	**1,949**	**2,044**	**2,146**	**2,303**	**(52,980)**
Cumulative Cash Flow		(68,825)	(68,775)	(68,725)	(68,589)	(66,862)	(65,093)	(63,281)	(61,422)	(59,473)	(57,430)	(55,283)	(52,980)	
Discount Rate - Annual	15.0%													
Discount Rate - Monthly	1.3%													
Discount Factor		*1.00*	*1.01*	*1.03*	*1.04*	*1.06*	*1.08*	*1.09*	*1.10*	*1.12*	*1.13*	*1.15*	*1.16*	
Discounted Cash Flow		(68,825)	49	49	131	1,623	1,642	1,661	1,683	1,743	1,805	1,872	1,984	(54,583)
Cumulative DCF		(68,825)	(68,776)	(68,727)	(68,596)	(66,973)	(65,331)	(63,669)	(61,987)	(60,244)	(58,439)	(56,567)	(54,583)	
DCF - Excluding Prior Sunk Costs and Cash Flow		$ (54,583)												
Internal Rate of Return		-16.54%												

Financial Analysis

Return on Investment Model - Simplified		Project	TrAceso								
Discounted Cash Flow Analysis											
Internal Rate Of Return											
Category		**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Totals**
Development Expense		(1,200)	(1,200)	(1,200)	(3,000)	(3,000)	(3,000)	(7,500)	(7,500)	(7,500)	(7,500)	(42,600)
Capital Equipment		(72,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)	(90,000)
Development Other		4,325	(4,325)	(4,325)	(6,325)	(6,325)	(6,325)	(6,325)	(8,325)	(8,325)	(8,325)	(54,600)
Total Cash (Investment) Each Year		(68,275)	(8,125)	(8,125)	(12,525)	(12,525)	(12,525)	(18,825)	(20,825)	(20,825)	(20,825)	(203,400)
Working Capital Impact	days											
(Incr)/Decr Accounts Receivable (CF)	60	(8,748)	(10,833)	(13,333)	(16,667)	(17,083)	(17,510)	(17,948)	(18,397)	(18,857)	(19,328)	
(Incr)/Decr Inventory (CF)	140	(13,064)	(16,178)	(19,911)	(24,889)	(25,511)	(26,149)	(26,803)	(27,473)	(28,159)	(28,863)	
Incr/(Decr) Accounts Payable (CF)	55	5,132	6,356	7,822	9,778	10,022	10,273	10,530	10,793	11,063	11,339	
Other		-	-	-	-	-	-	-	-	-	-	
Total Working Capital Impact on Cash		(16,680)	(20,656)	(25,422)	(31,778)	(32,572)	(33,387)	(34,221)	(35,077)	(35,954)	(36,852)	
Total Working Capital impact on Cash Each Year		(2,289)	(3,976)	(4,767)	(6,356)	(794)	(814)	(835)	(856)	(877)	(899)	
Total Cash (Outflow)		**(70,564)**	**(12,101)**	**(12,892)**	**(18,881)**	**(13,319)**	**(13,339)**	**(19,660)**	**(21,681)**	**(21,702)**	**(21,724)**	
Cash Inflow From Sales												
price & cost escalation						*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	
Sales		$ 52,490	$ 65,000	$ 80,000	$100,000	$102,500	$105,063	$107,689	$110,381	$113,141	$115,969	952,233
Cost of Goods Sold		33,593	41,600	51,200	64,000	65,600	67,240	68,921	70,644	72,410	74,220	609,429
Gross Profit		18,896	23,400	28,800	36,000	36,900	37,823	38,768	39,737	40,731	41,749	342,804
		36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
Other "Direct" Variable Costs												
Freight		-	-	-	-	-	-	-	-	-	-	
Commissions	2.5%	1,312	1,625	2,000	2,500	2,563	2,627	2,692	2,760	2,829	2,899	
Other		-	-	-	-	-	-	-	-	-	-	
Operating Income		17,584	21,775	26,800	33,500	34,338	35,196	36,076	36,978	37,902	38,850	318,998
Net Annual Cash Flow		**(52,980)**	**9,674**	**13,908**	**14,619**	**21,018**	**21,857**	**16,416**	**15,297**	**16,200**	**17,126**	**93,137**
Cumulative Cash Flow		(52,980)	(43,305)	(29,397)	(14,778)	6,240	28,097	44,513	59,810	76,011	93,137	
Discount Rate	15.0%											
Discount Factor		*1.00*	*1.15*	*1.32*	*1.52*	*2.01*	*2.31*	*2.66*	*3.06*	*3.52*	*6.15*	
Discounted Cash Flow		(52,980)	8,413	10,517	9,613	10,450	9,449	6,171	5,001	4,605	2,783	14,021
Cumulative DCF		(52,980)	(44,567)	(34,051)	(24,438)	(13,988)	(4,539)	1,632	6,633	11,238	14,021	
DCF - Excluding Prior Sunk Costs and Cash Flow		$ 14,021										
Internal Rate of Return		24.67%										

Appendixes

Sources cited:

- University of Illinois at Chicago. (n.d.). 5 Ways Technology is Improving Health [Web log post]. Retrieved September 27, 2020, from https://healthinformatics.uic.edu/blog/5-ways-technology-is-improving-health/
- Ventola CL. Mobile devices and apps for healthcare professionals: uses and benefits. P T. 2014 May;39(5):356-64. PMID: 24883008; PMCID: PMC4029126. Retrieved September 27, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4029126/
- Bora P. The Ultimate Guide to App Development for Healthcare. 2020 May, 22. Retrieved October 15, 2020 from https://www.digitalauthority.me/resources/healthcare-app-development-ultimate-guide/
- https://www.chcf.org/wp-content/uploads/2017/12/PDF-LaCl%C3%AEnicaFinancialAnalysis.pdf

Focus Area - HealthCare

Healthcare is an industry that focuses on the improvement of health via treatment, recovery, diagnosis, or cure of medical problems such as diseases, mental and physical disabilities, etc… Healthcare is provided and delivered by health professionals and similar health fields.

Examples of healthcare providers would be doctors, nurses, lab technicians, pharmacists, etc...

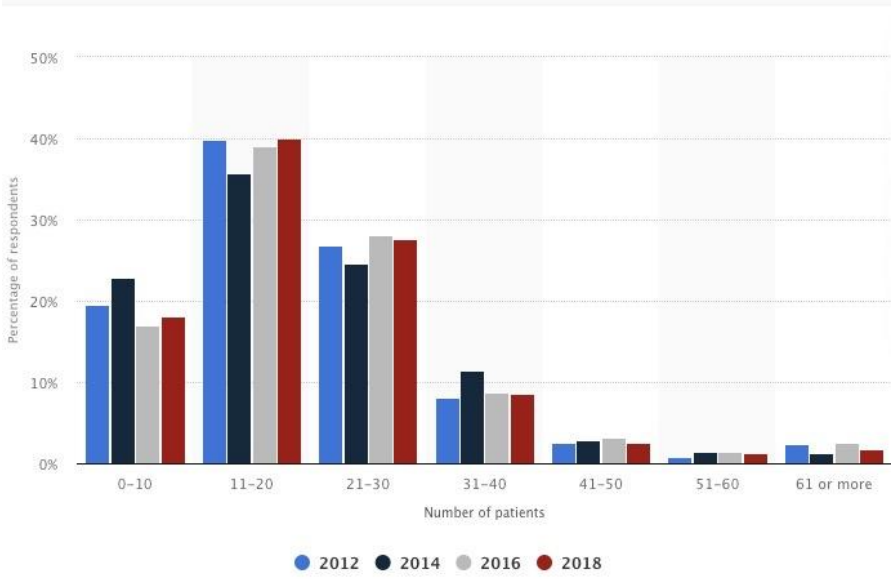
Market Research - Primary

Users mentioned some features are missing from current platforms they use:

- Access to diagnoses
- Sharing with providers outside a health system
- Find a doctor/provider that fits my insurance and medical status
- Design simplicity and organization (only show what is important and commonly used)
- Multi-factor Authentication

Market Research Findings

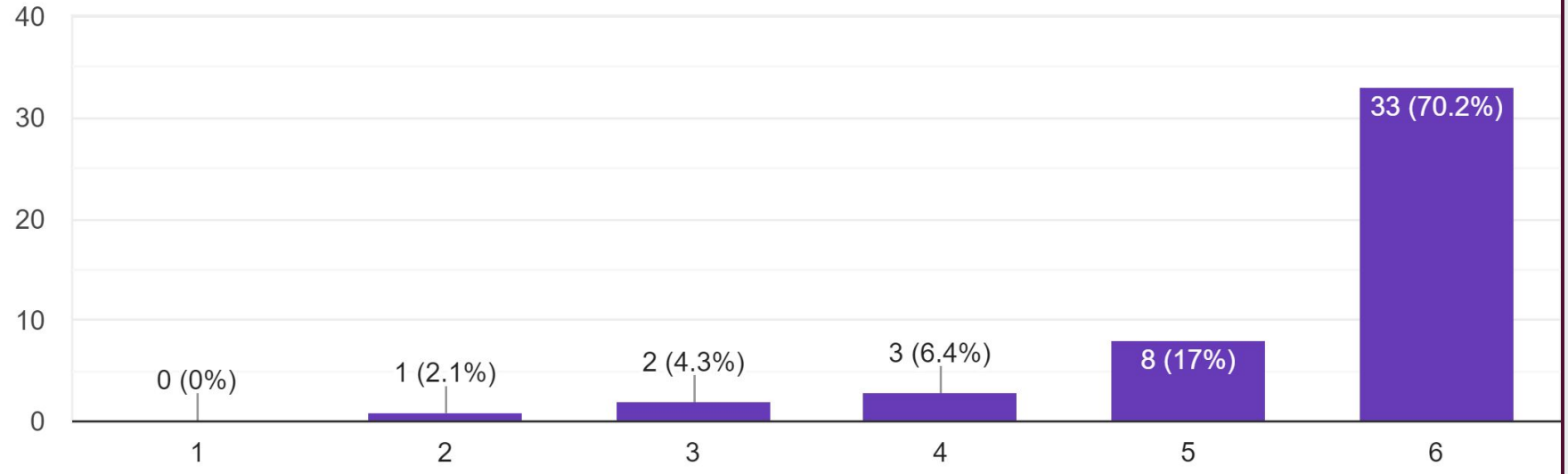
- Number of patients that physicians in the U.S. saw per day from 2012 to 2018
- Research shows the average wait time for a doctor's visit is approx. 2 hours, while patients only see doctors for 20 min (costing patients on average $43 per visit)
- Scheduling new appointments can vary between 11 days to 51 days depending on location



2. Bora P. The Ultimate Guide to App Development for Healthcare. 2020 May, 22. Retrieved October 15, 2020 from https://www.digitalauthority.me/resources/healthcare-app-development-ultimate-guide/

USERS: On a scale from 1 to 5 (1-not useful, 5-very useful) how would you rate the application(s) you have used/are using. (NON-USERS answer 6)

47 responses



Pros and Cons of Existing Applications

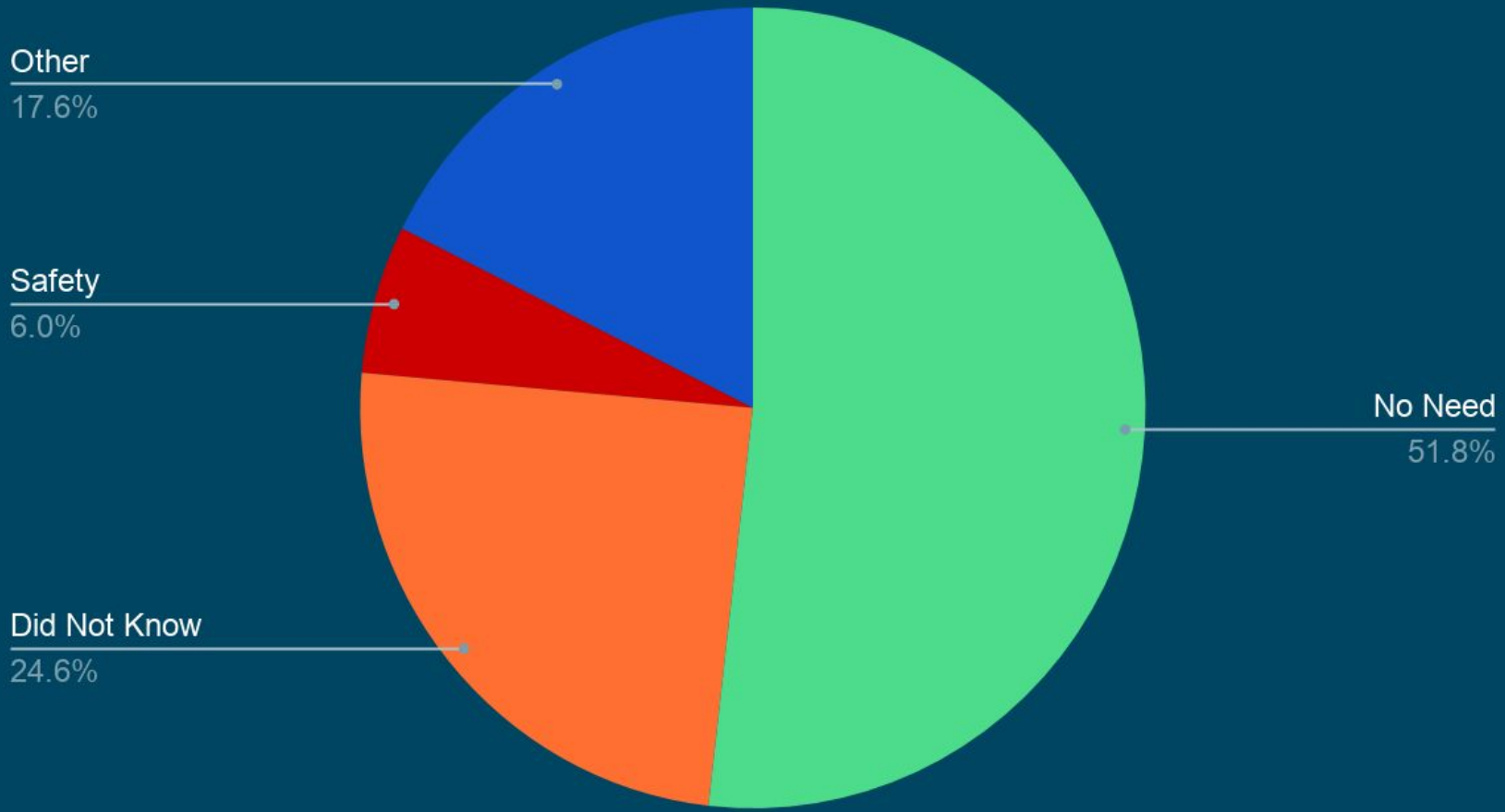
PROS:

- Saves time
- Less Waiting
- Easy access to:
  - Test results
  - Appointments
  - Billing information
- Templates for certain conditions (Designed by Doctor and could be universal)a

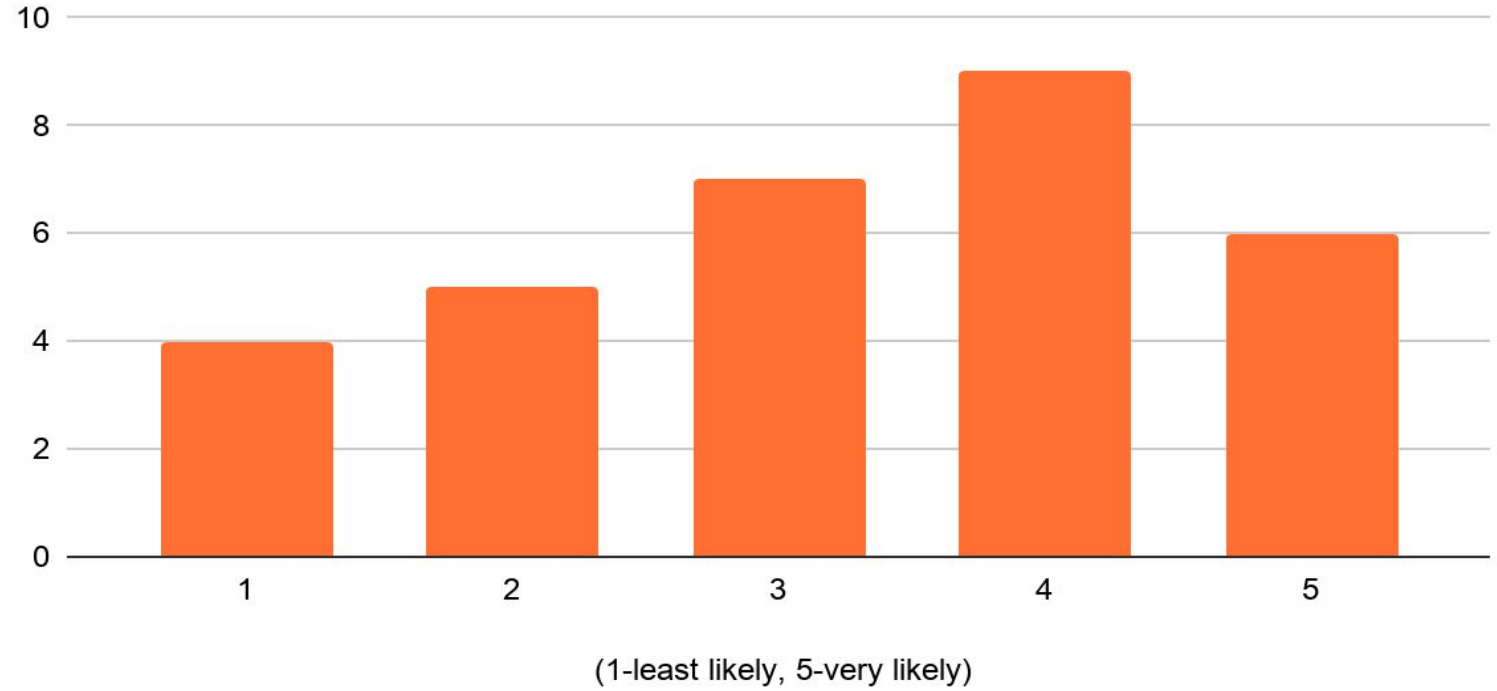
CONS:

- Misdiagnosis
- Slow updates
- Old interface
- Setup Problems

Why non-users do not have/use existing applications?



How likely would you use a medical information management application(s)?



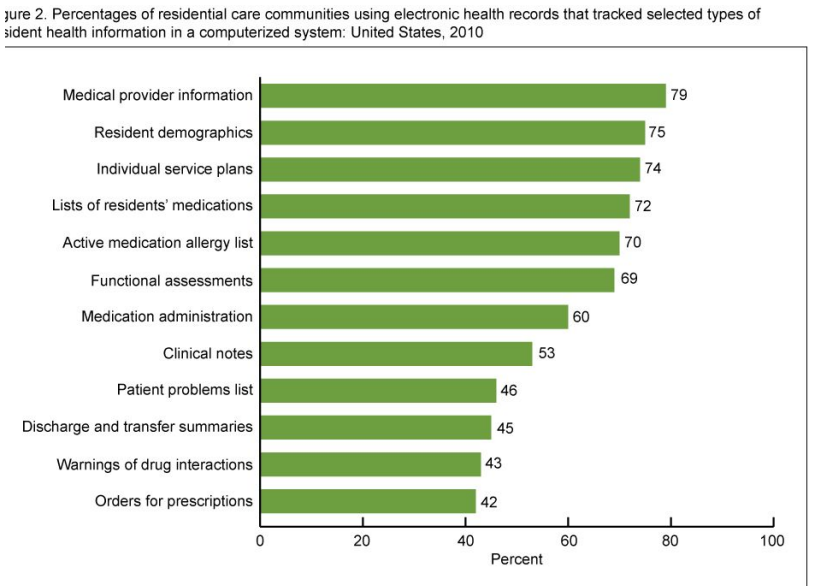
Market Research Findings - 2° Market Research

What does the data tell us:

About 70% health care communities use electronic health records(EHR) in some form

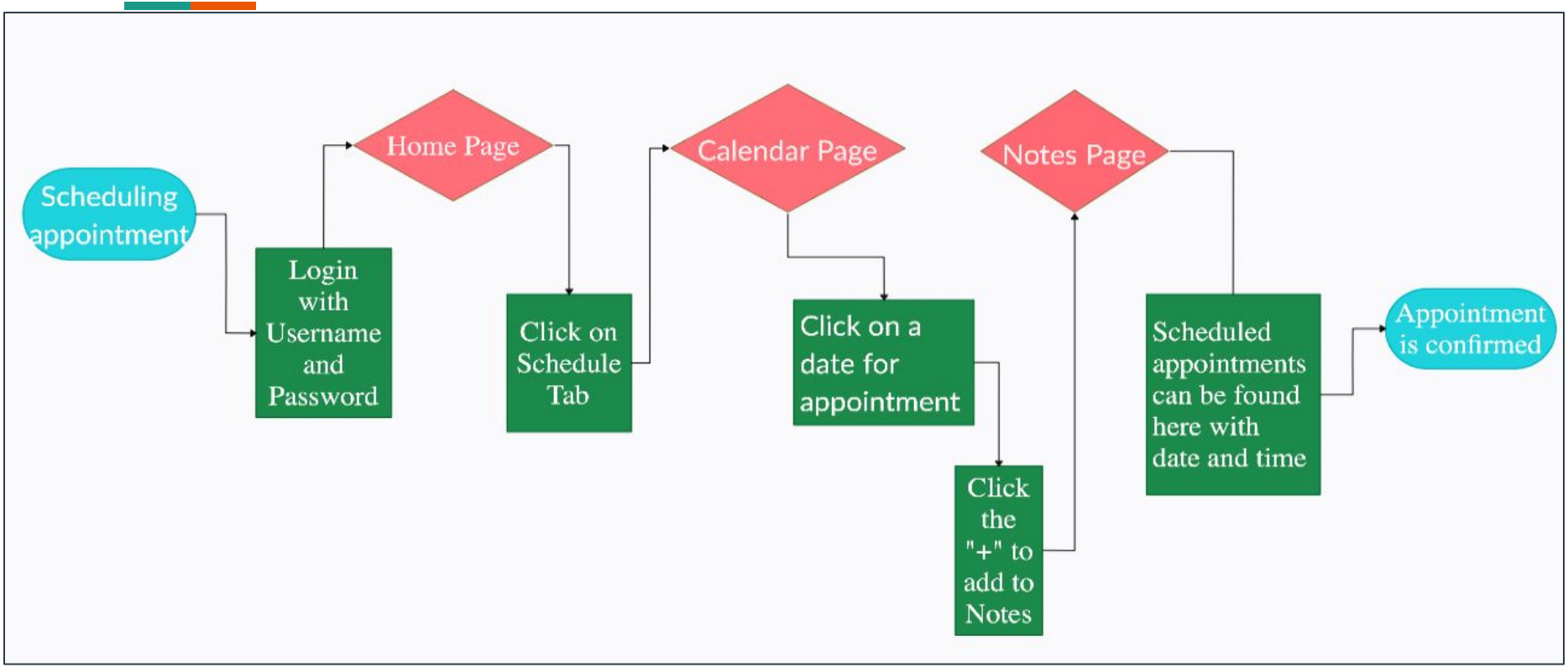
Less than half of the communities, show information like orders for prescriptions, problems, and clinical notes through EHR

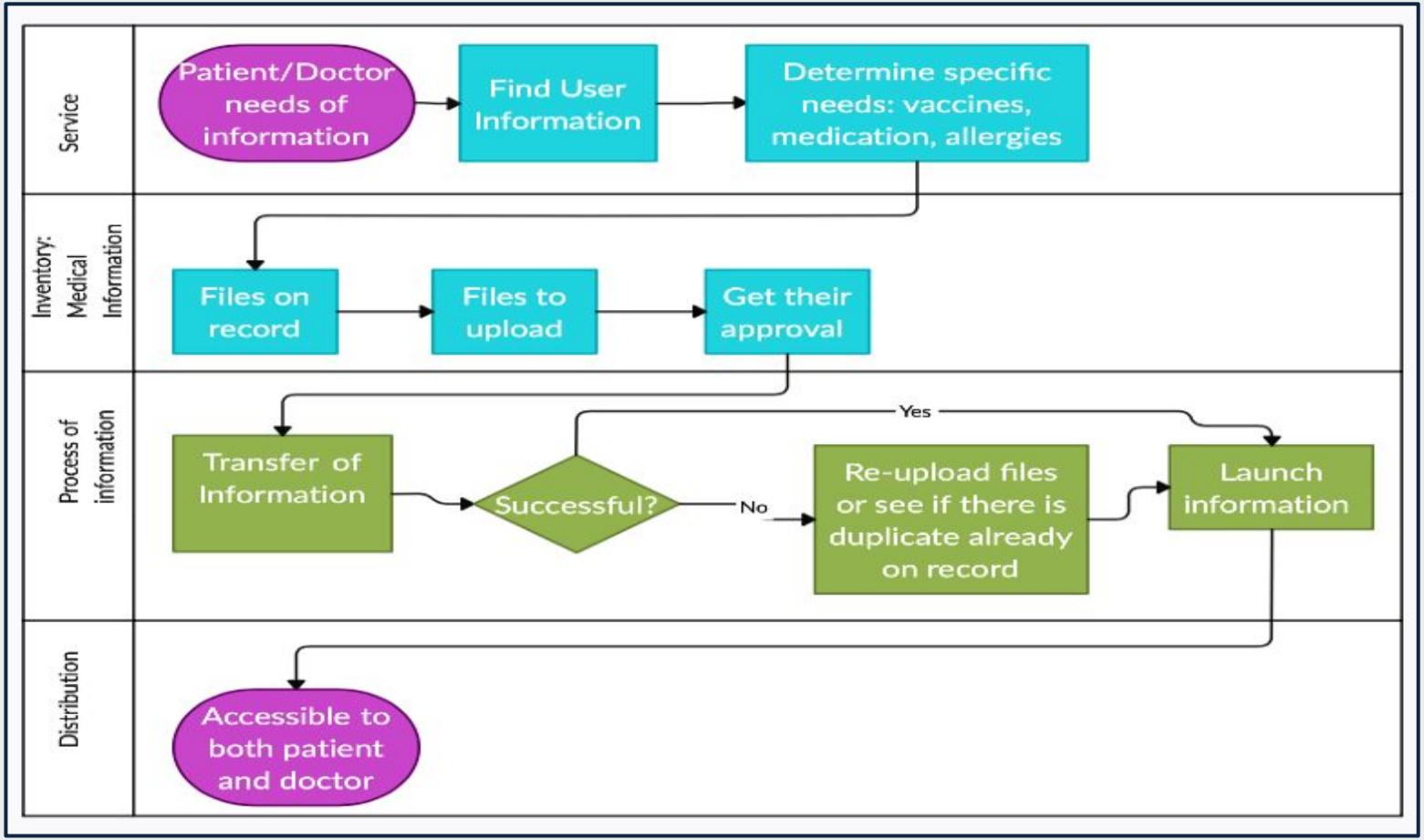
Less than 50% of people feel they have access to lab tests,general health history, medications



1. Caffrey, Christine, and Eunice Park-Lee. "Products - Data Briefs - Number 128 -September 2013." *Centers for Disease Control and Prevention*, Centers forDisease Control and Prevention, 6 Nov. 2015,www.cdc.gov/nchs/products/databriefs/db128.htm

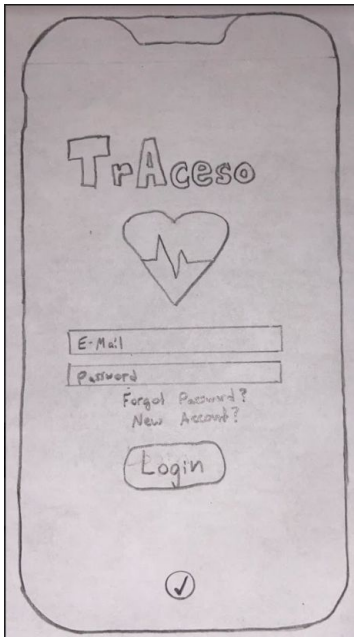
Solution Flow Diagram

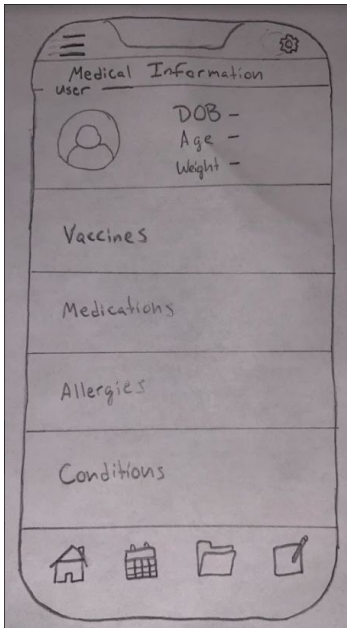


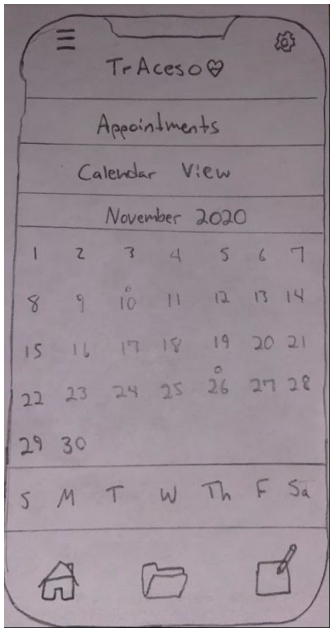


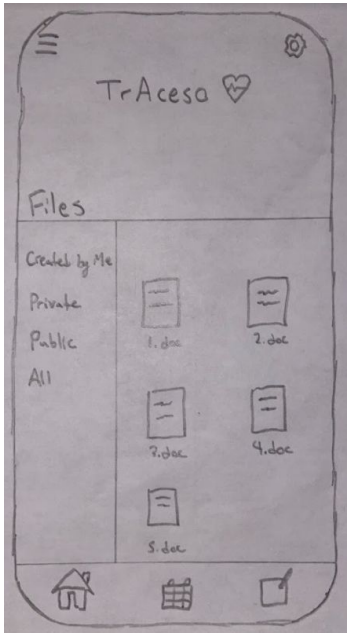
Business Flow Diagram

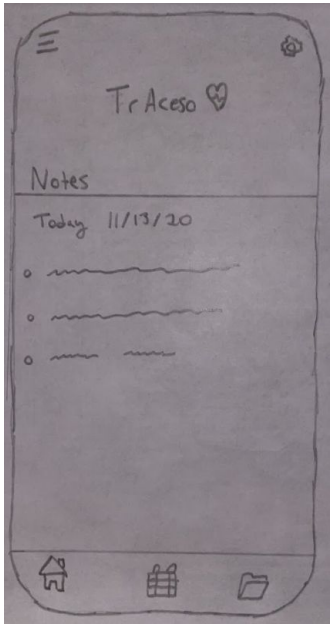
Draft UI/UX Design



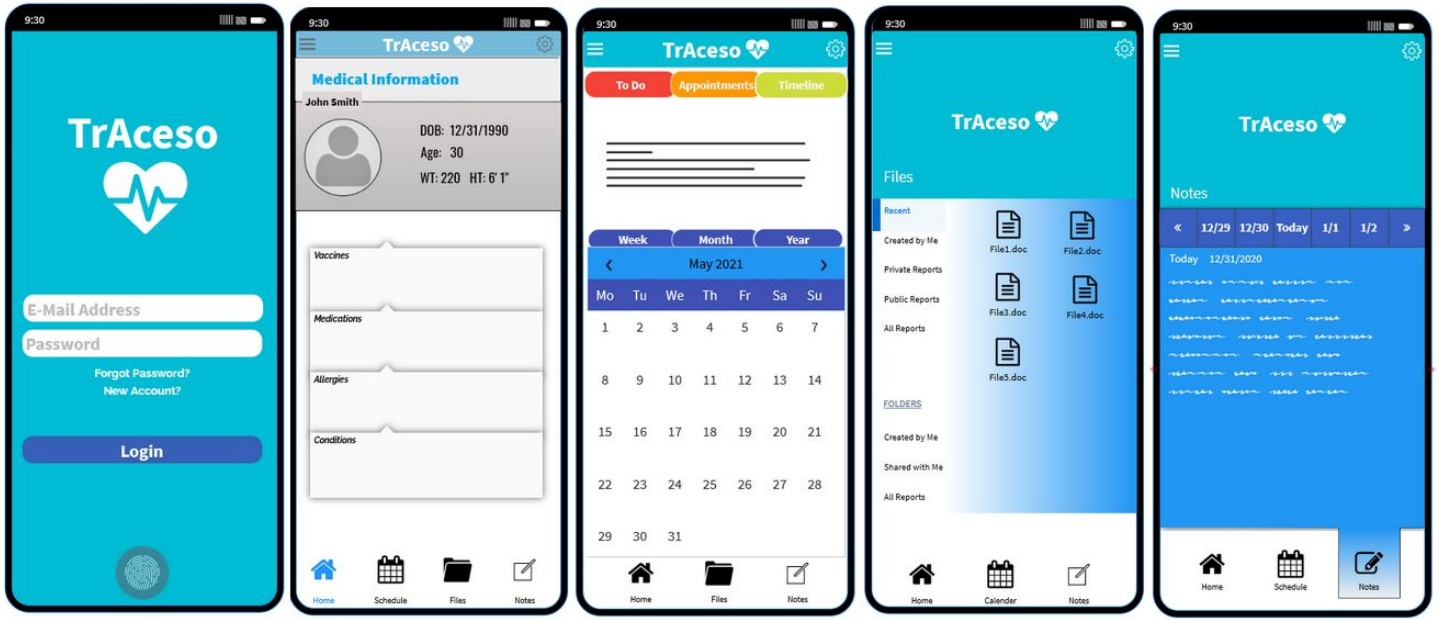








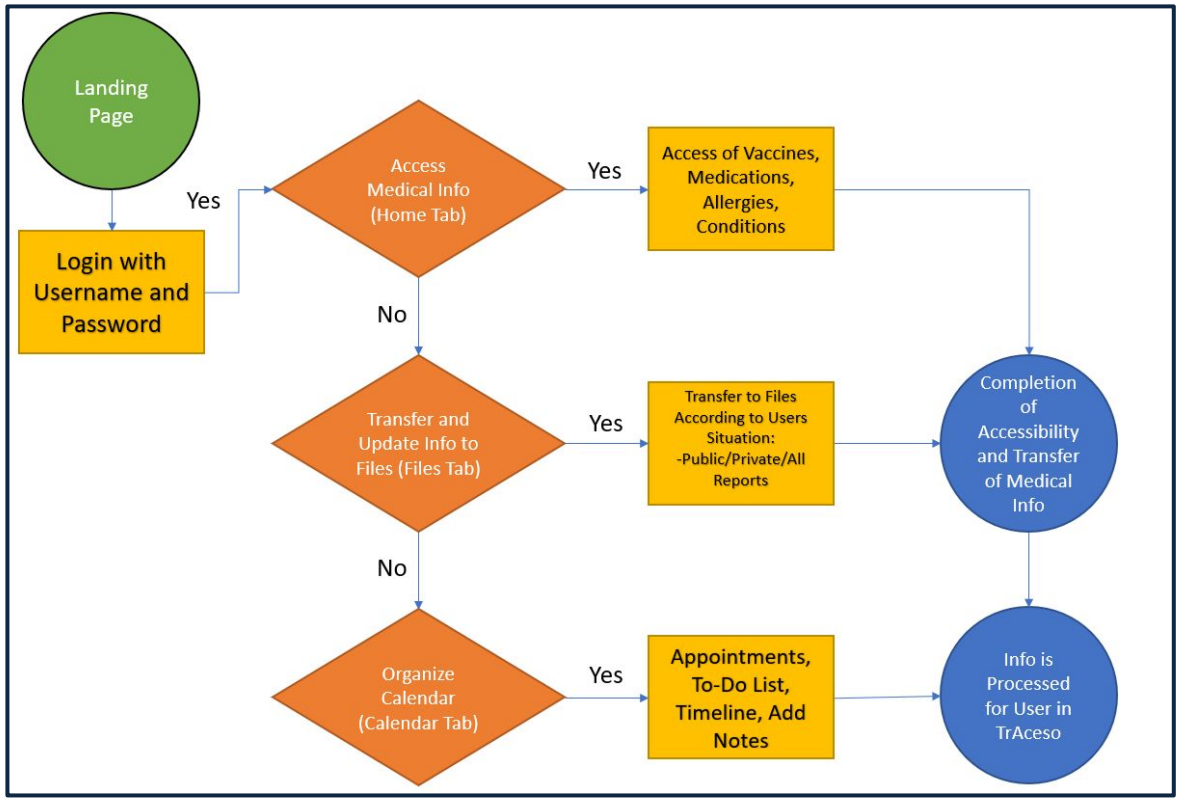
Low- Fidelity Prototype



Draft UI/UX Design

UI/UX Prototype Flowchart

- Simple navigation
- Home Tab, Files Tab, Calendar/Notes Tab



Project Plan - High Level

Stage 1	The Pitch	Week 5
Stage 2	Planning	Week 7
Stage 3	Design and Development	Week 11
Stage 4	Final Stage	Week 13

Project Plan - Detail Level

Task	Person	Due Date
Financial Analysis	Dominic	11/06/2020
Market Research	Gausanary	10/25/2020
Business Analysis	Nooree	10/27/2020
Design	Yuri, Raisa, Chris	11/12
Prototype Development	Chris, Yuri, Raisa	11/12~12/01

Project Plan Resources

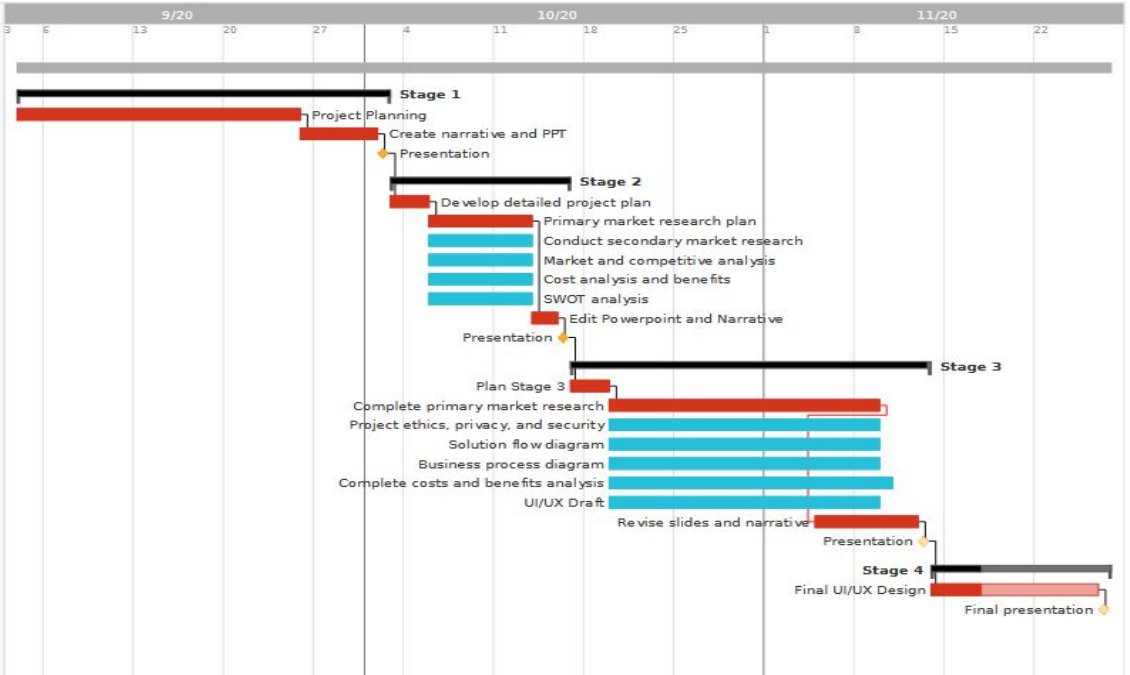
Resources required for our project

- Time: Present ~ 11/15
- Meetings: Mondays and Wednesdays at 1:00PM - 2:30 PM
- Outside Research on targeted market, business needs, tech field
    - Business Research
    - Targeted Audience Research
    - Web/App Development
- Capital to be acquired through seeking Venture Capital/Angel Investors

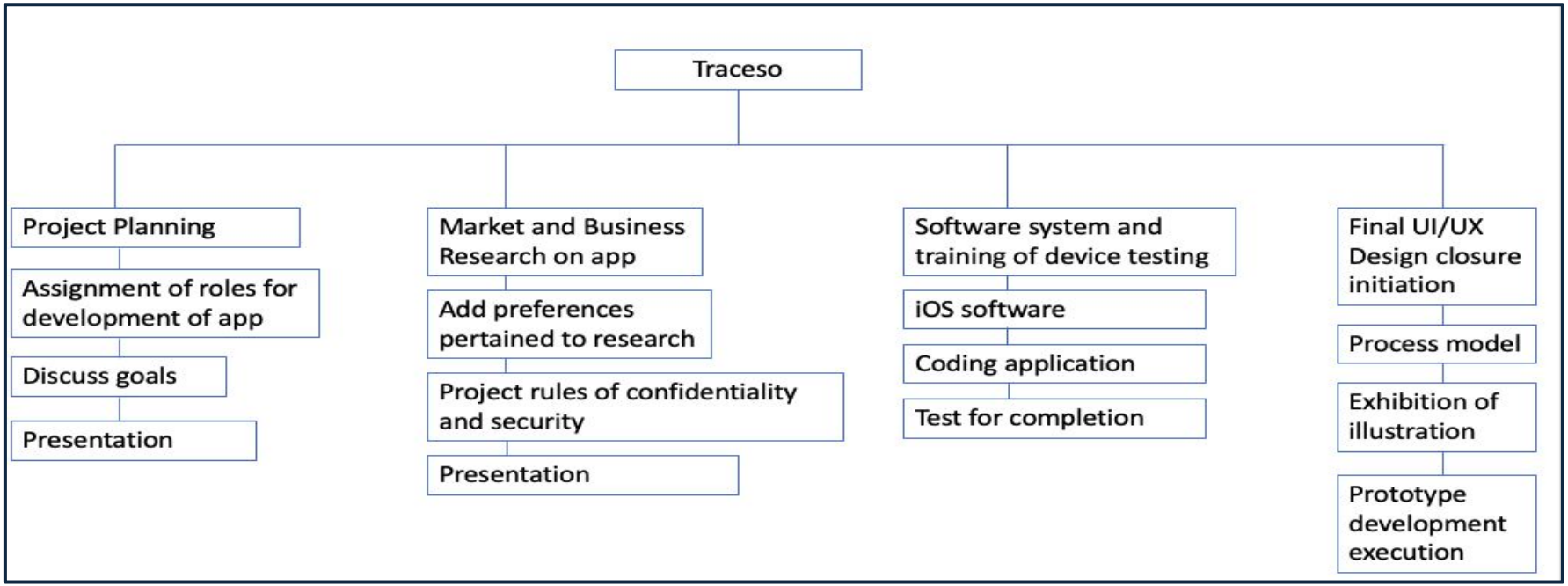
Project Plan - Gantt Chart

teamgantt
Created with Free Edition

TrAceso	start	end	95%
Stage 1	**09/04/20**	**10/02/20**	**100%**
Project Planning	09/04	09/25	100%
Create narrative and PPT	09/26	10/01	100%
Presentation	10/02	10/02	100%
Stage 2	**10/03/20**	**10/16/20**	**100%**
Develop detailed project plan	10/03	10/05	100%
Primary market research plan	10/06	10/13	100%
Conduct secondary market research	10/06	10/13	100%
Market and competitive analysis	10/06	10/13	100%
Cost analysis and benefits	10/06	10/13	100%
SWOT analysis	10/06	10/13	100%
Edit Powerpoint and Narrative	10/14	10/15	100%
Presentation	10/16	10/16	100%
Stage 3	**10/17/20**	**11/13/20**	**99%**
Plan Stage 3	10/17	10/19	100%
Complete primary market research	10/20	11/09	100%
Project ethics, privacy, and security	10/20	11/09	100%
Solution flow diagram	10/20	11/09	100%
Business process diagram	10/20	11/09	100%
Complete costs and benefits analysis	10/20	11/10	100%
UI/UX Draft	10/20	11/09	100%
Revise slides and narrative	11/05	11/12	100%
Presentation	11/13	11/13	0%
Stage 4	**11/14/20**	**11/27/20**	**28%**
Final UI/UX Design	11/14	11/26	30%
Final presentation	11/27	11/27	0%



Project Plan - Work Breakdown Structure



Appendixes(cont.)

- Caffrey, Christine, and Eunice Park-Lee. “Products - Data Briefs - Number 128 -September 2013.” Centers for Disease Control and Prevention, Centers forDisease Control and Prevention, 6 Nov. 2015,www.cdc.gov/nchs/products/databriefs/db128.htm
- Sugarman, Elise and Ashley Kirzinger “Filling the need for trusted information on national health issues”https://www.kff.org/global-health-policy/poll-finding/kaiser-health-tracking-poll-august-2016/
- (n.d.). Retrieved November 13, 2020, from https://app.creately.com/diagram/gadYuNkDRsu/view