Asesor

Timely and continuous life-long care for all Canadians

Shortage of Primary Care Doctors

For every 1000 people in Canada there are only 1.37 primary care physicians.

Low physician-patient ratio means lack of continued care leading to worse health outcomes.

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Meet the Team

Hamza Jamal
Business Expert & Market Researcher

Kevin Chiang
Marketing Specialist & Designer

Turash Mosharaff
Machine Learning Expert & Lead Architect

Taranjot Singh
Project Coordinator & Software Engineer

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Our Proposed Solution

1. Automate Q&A
2. Report Generation
3. Self Scheduling

Timely Care

4. Digital Records
5. Easy Sharing

Continuous Care

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Application Demo

Let’s walk through how patients can use Asesor, together.

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Product Market Fit

Customer

80,777
primary care clinics in Canada

3.4% drop
Profit margins dropped from **58.7%** in **2014** to **55.3%** in **2019**

Low volatility
Population growth keeps revenue volatility extremely low

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90%
of Canada's total clinic revenue consists of services optimized by Asesor

Increased efficiency
Report generation for episodic, follow-up, chronic disease management, and preventative health exam visits

Reduced costs
Intelligent scheduling and records management features will reduce customer's costs

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Azure is the first major cloud provider to have been granted the hébergeurs de données de santé certification

Security and Privacy

We understand that health data is extremely sensitive. We required measures that included strong authentication and authorization procedures, robust backup systems, and powerful encryption methods.

Microsoft Azure was the clear choice.

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Architecture Diagram

Turash will show you how we utilize Azure to power our services.

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Asesor AI Features

I. Chatbot (DEMO)
   i. Determining Question Flow [**Intent**]
   ii. Sentiment Analysis [**Sentiment**]

II. Report (DEMO)
   i. Information Parsing [**Intent**]
   ii. Entity Recognition [**Entity**]

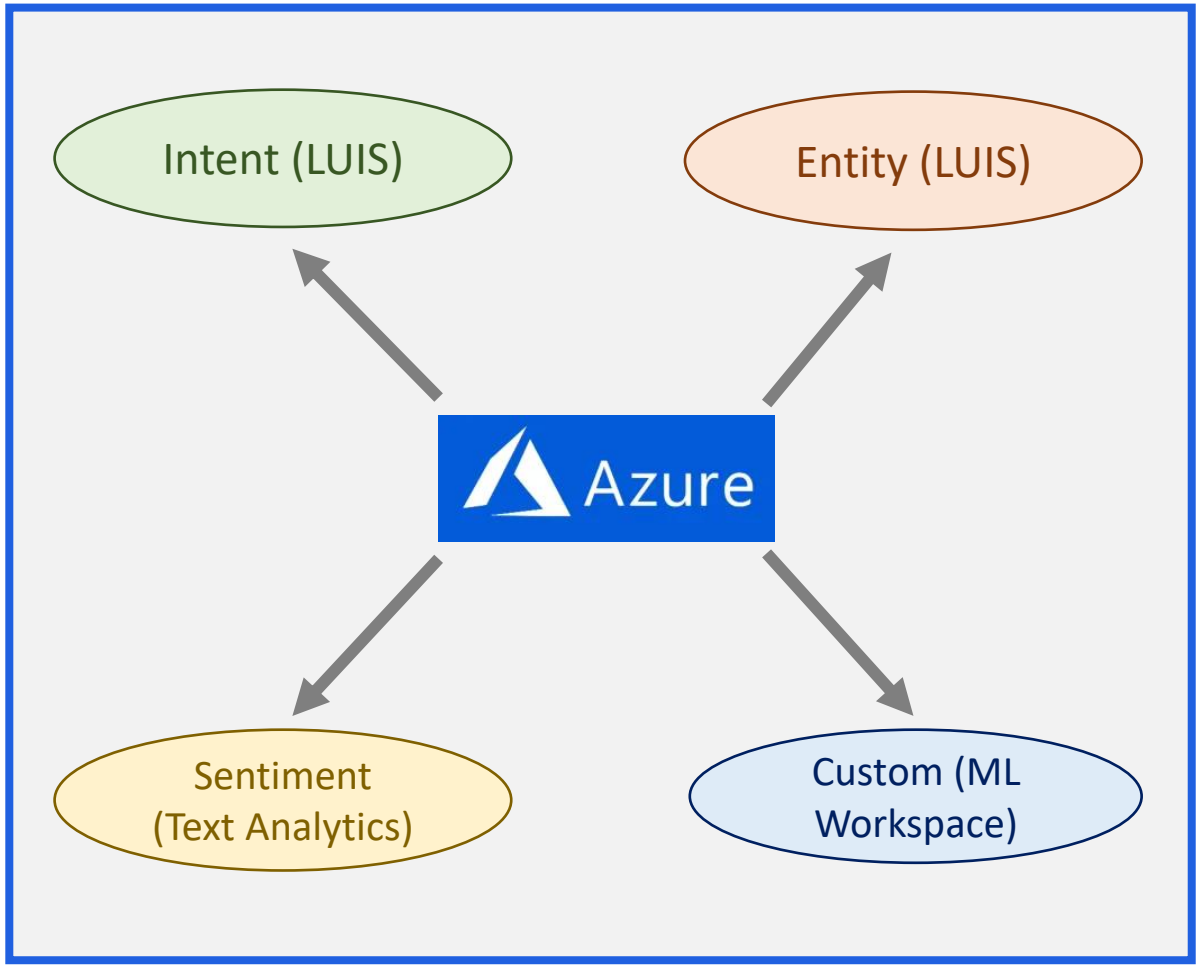
III. Other
   i. Clinical insights [**Custom**]

Datasets:

✓ Kaggle (Kaggle Link)

✓ Universities, Research Labs (Harvard Link) (MIMIC)

✓ DrugBank (DrugBank Link)



Azure Services

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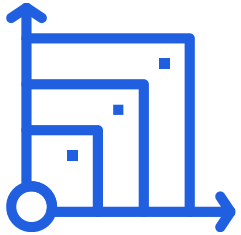
Sustainable Business Model

Leverages the elasticity of cloud deployment

Low Fixed Costs

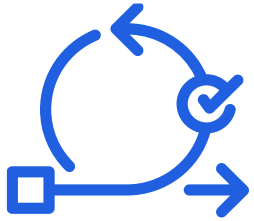
- Ingestion/Data Lake/Data Processing & ML/Semantic Layer
- $5000/month for 1TB



Frictionless scalability as our business grows

Measurable Variable Costs

- Adapt to computing power increases
- Easily incorporate new technologies



Constant agility with isolated technical architecture

Revenue Security

- Integration strategy “locks in” customers
- Default risk of customer payments is extremely low

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Competitive Advantage

Competitiveness

Clinics’ bottom line

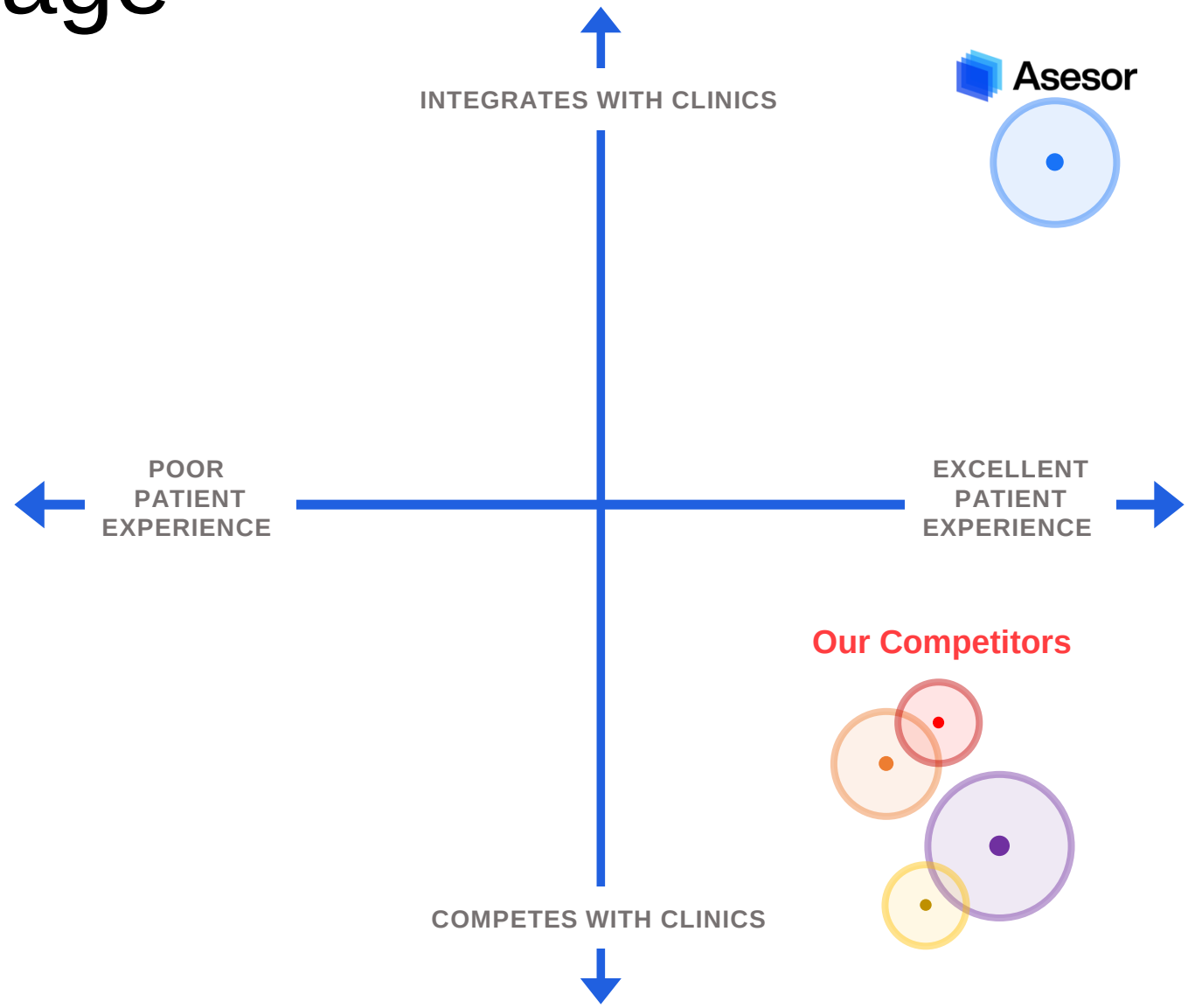
Focused on improving clinics’ bottom line

Life-long care

Differentiated by delivering continuous life-long care

Integration

Integrates with the current healthcare infrastructure



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Go-to-Market Plan

Pilot with 5 partner clinics to begin

After Milestone 4 in the technical roadmap

Expand and perfect offering to launch within Canada

Market potential: over 80,000 primary care providers

Revolutionize the patient-doctor experience globally

Market potential:

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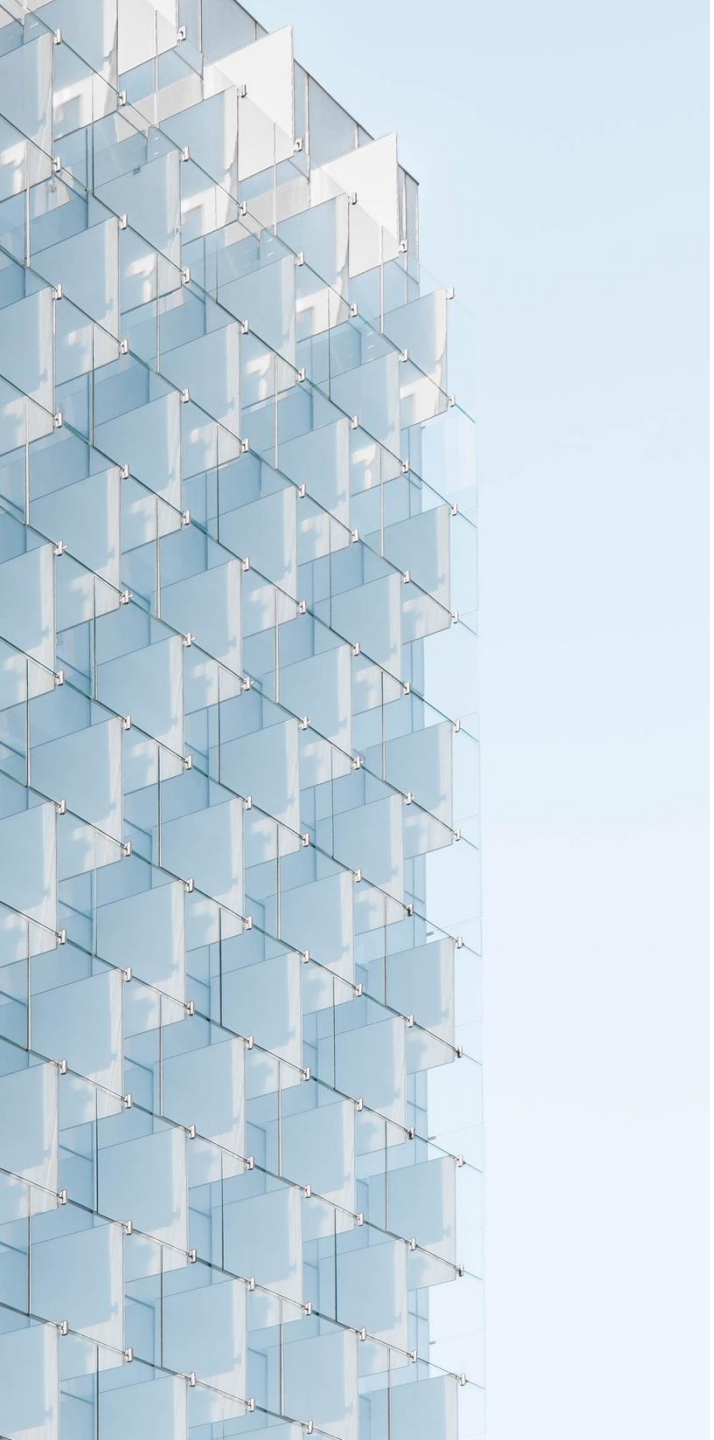

Data for a better tomorrow

Scarce, transformative, robust.

The medical data we accumulate will be a powerful asset and an enabler for outstanding strides in the medical research space.

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Our Vision

Timely and continuous life-long care for all.

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Thank you, merci.

We welcome your questions
& feedback.

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Additional files & information

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Technical Roadmap

Milestones	M1: Planning 0.5 months	M2: AI & Machine Learning 2 months			M3: Development 1.5 months		M4: Integration 1 month	M5: Testing 1 month
Developing Chatbot	Create Questionnaire	Local Testing	Azure Deployment	Sentiment analysis using Text Analytics				
Parsing Responses to Build Report	Finalize Report Structure			Implement parsing: key phrase and named entity	Integrate Chatbot with Parser			
Predict Time Estimate	Data Collection (external source)	Feature Engineering	Building Local Model	Azure Deployment				Validation and Tuning
Back End Development			Set Up Azure App Service	Set Up Cosmos DB	Implement Backend Locally	Azure Deployment	Integration with ML Modules	Regression Testing
Front End Web Application					Implement Frontend	Azure Deployment	Integration with Backend	Regression Testing
Additional Technical Operations	Security and Quality Considerations (continuous)							

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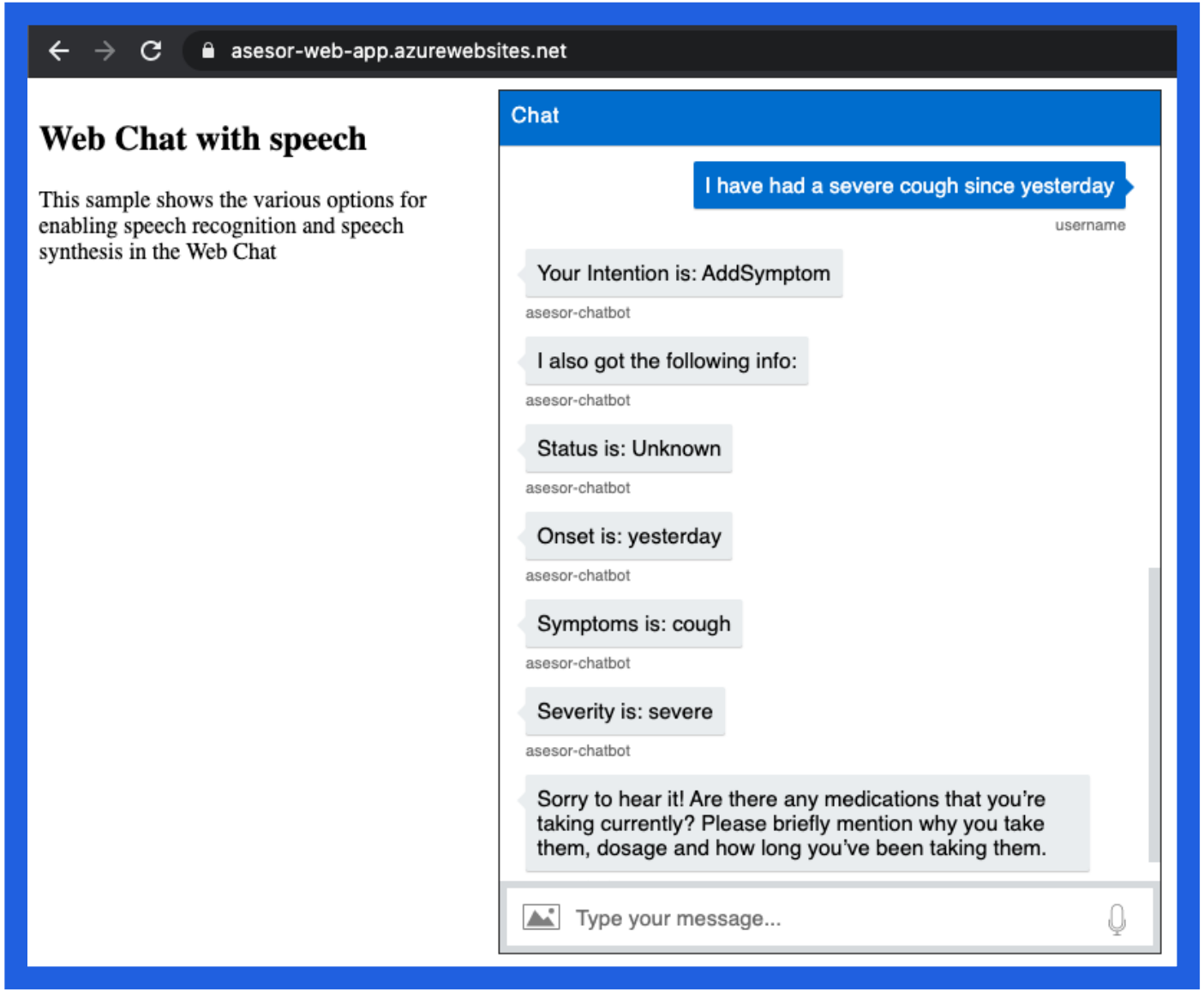
Technical Demo



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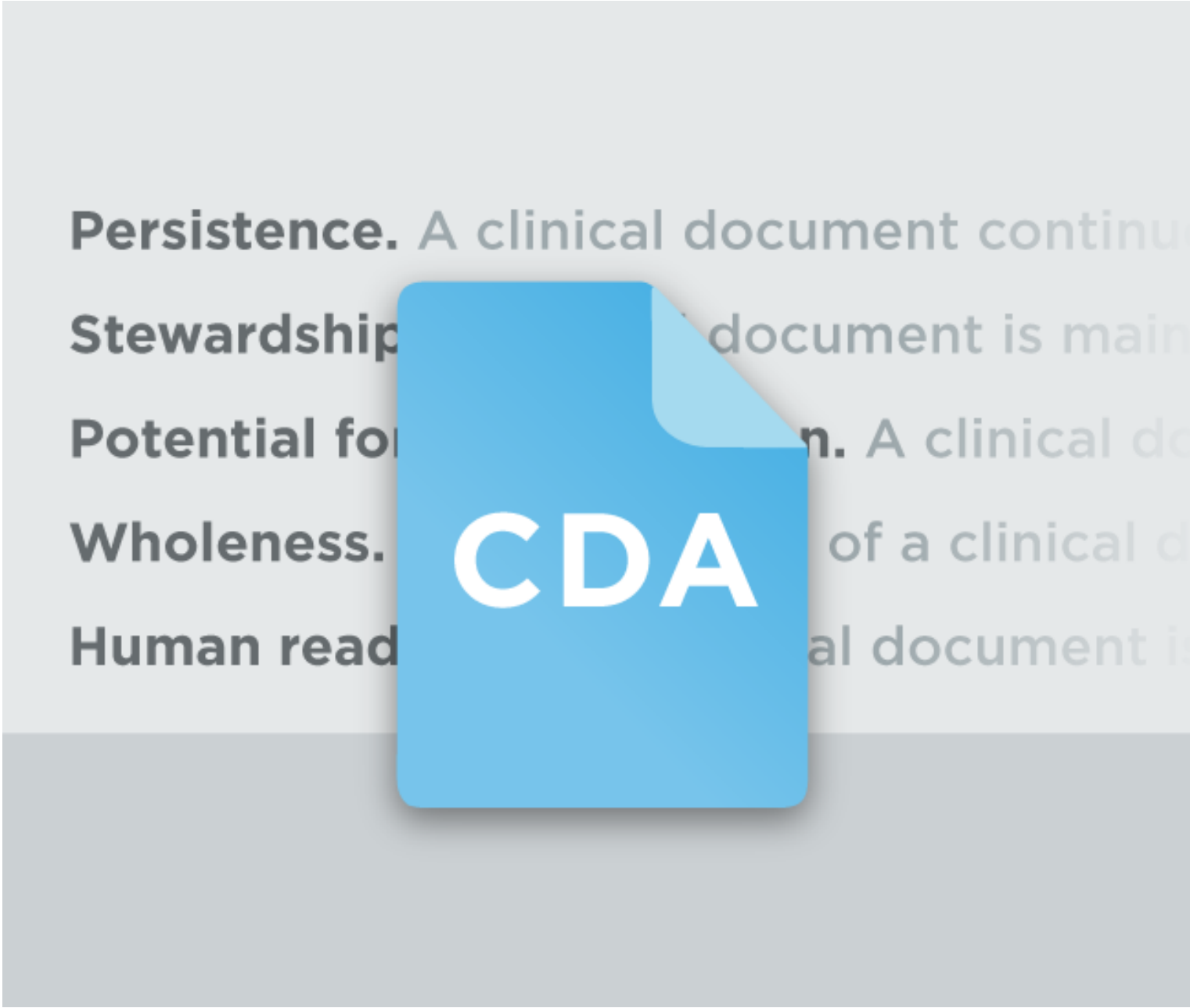
FHIR

- Fast Healthcare Interoperability Resources (FHIR) is a system to standardize data.
- Each record is stored in this format, allowing interoperability between external sources if necessary.
- Azure has an API for FHIR to bring together data from different systems using the HL7 FHIR format.
- Cosmos DB is hosted on an FHIR server.
- This allows us to be extensible and interact with any healthcare system in the future.

Clinical Document Architecture

Clinical Document Architecture (CDA) is an XML-based standard for encoding clinical documents for easy data exchange. We train our Entity Resolution Model according to CDA.



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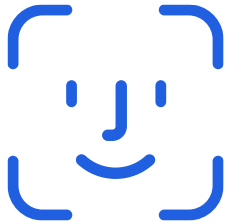
Our Commitment to Privacy and Security

Utilizing Azure to secure Asesor

Enhance Data Protection

- Azure Key Vault protects our data in the cloud
- Azure is GDRP and PIPEDA compliant



Biometric security where possible

Easy. Secure. Effortless.

- Use biometric security methods like Face ID where possible to secure the app and important medical records

Strong integration with user devices

Trusted Protection

- Smart and strong integration with Apple and Google services such as Sign in with Apple and Sign in with Google

Anonymization of user data

Differential Privacy

- We remove identifiers from datasets while still describing patterns of groups within the dataset

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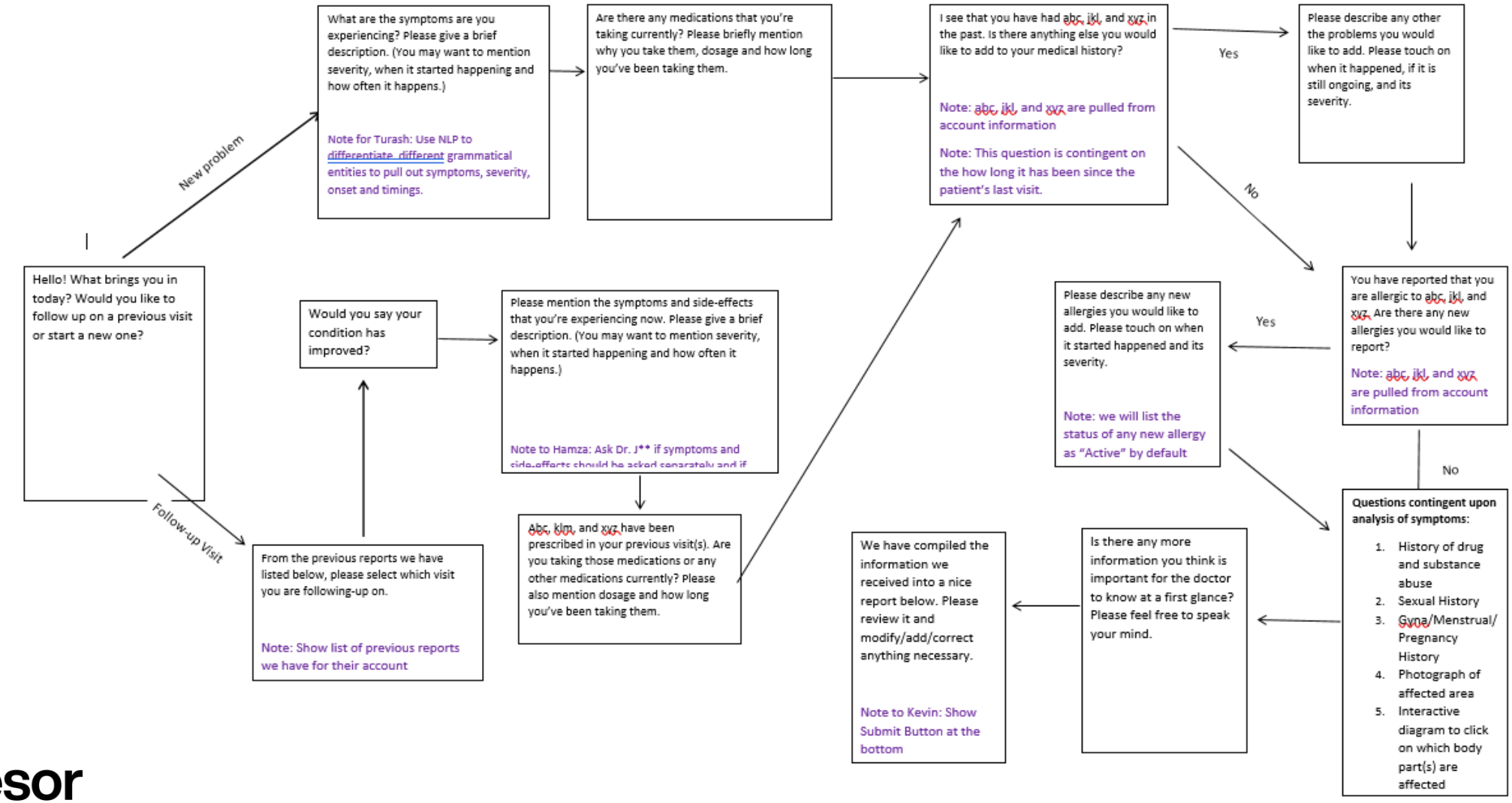
Question Tree



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Summary of Benefits

Asesor's Features	Benefits
Intelligent Questioning	• Automates 60% of a standard 15 min appointment • Saving this time means that more patients can be seen • Clinics have an incentive to use Asesor earn more revenue
Report Building	• Doctors don't have to spend time documenting patient's responses • Can focus on quality of care and relationship with patient • They add diagnosis and medical prescription information after the appointment to make the report complete.
Secure storage of all a patient's reports	• Life-long continued care. Even if a patient does not have a family doctor, they can easily share all their medical history to any doctor they visit. • Clinics can easily retrieve digital patient files and don't have to maintain large number of paper files. • Patients don't have to keep paper copies of their medical history • Reports can be shared with clinics and specialists without faxing (which is done currently).
Patient self-scheduling	• Saves clinic staff administrative time • Flexibility to patients
Emergency Prediction, Time Estimates and Other Statistics	Based on the report, we can estimate if the problem is severe enough to tell the patient to contact emergency. We can also provide time estimates for an appointment length based on a patient's report for intelligent scheduling. And we can discern other statistics from patients' reports that may be helpful for clinics to know.
User-Friendly Clinic Portals	• Clinics draw and visualize insights from reports to optimize their functioning. • Can easily access, share and modify patient reports through a user-friendly clinic portal.

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Datasets

- Kaggle (Kaggle Link):
  - Symptom-Disease Sorting Dataset
  - Symptom Corpus Dataset
- University (Harvard Link):
  - CCHMC Radiology Corpus (For Multi Label Classification)
  - ShARe Disorder Corpus (Analysis of Clinical Text)
  - THYME Corpus (For temporal Anaphora)
- Mimic (MIMIC)
- DrugBank (DrugBank Link):
  - All Drugs

Interview with Dr. Kiai

- I like that there is consideration to saving time from asking and documenting standard questions and updating records of patients. This would even help front-desk staff.
- By having patients narrow down their chief complaint prior to the visit, it helps the physician quickly narrow down their diagnosis and save time during the visit.
- Physicians prefer to limit # of problems per visit and avoid unrelated problems (ie. coming in for a cough, and then also mentioning another issue of back pain) So if this platform helps narrow down to a single problem/ related problems for each visit, would be much more efficient.
- I think many providers would be keen to have patients use an app to answer questions prior to their visit. On a practical level, this would even help front desk staff and medical assistants prepare and set-up the patient rooms accordingly.

Dr. Cristina Kiai is a Family Physician in North Vancouver, BC and has been in practice for 30+ years.

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