



SmartDoc: Pre-Visit Summary Tool for Outpatient Physicians

INFO 6215 - Business Analysis and Information Engineering

Case Study by: Kalyani Wasave



Industry Segmentation: Outpatient Clinics in Healthcare

- Outpatient Physicians/Doctors
- Medical Assistants (MAs)
- Patients
- Administrative Staff
- EHR Vendors (Epic, Athena, PrognoCIS)
- ACOs (Accountable Care Organizations)
- Hospitals (If connected)



Problem Statement:

“Nearly 70% of doctors in outpatient clinics struggle to find the most relevant information before a patient’s visit because Electronic Health Records (EHR) systems are complex and spread across many tabs. This inefficiency contributes to cognitive overload, reduces meaningful patient interaction, and leads to physician burnout.”

-Source: JAMA, NIH, Stanford studies (2023–2025)



Problem Discovery & Validation

Primary Research:

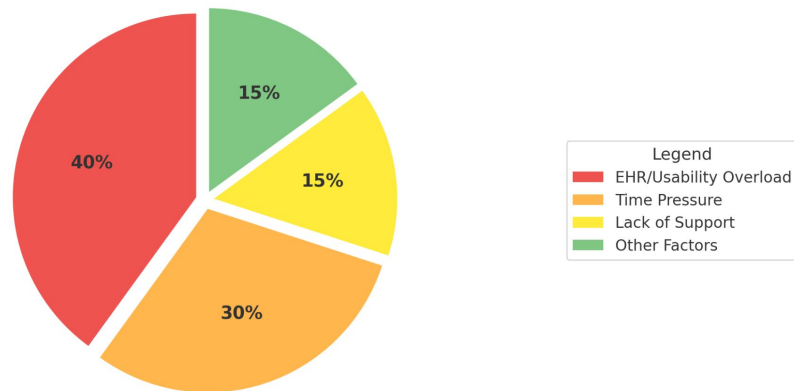
Spoke with healthcare professionals and reviewed academic studies as below:

- [Stanford Medicine \(2025\)](#) on burnout and its impact on care quality
- [JMIR Medical Informatics \(2024\)](#) on EHR-related burnout
- [JAMA Network Open \(2023\)](#) on physician dissatisfaction with EHR usability
- [NIH Study \(2024\)](#) on time allocation in outpatient care

EHR Observation:

Explored demo EHR systems like PrognoCIS; identified usability gaps and time-consuming navigation.

Primary Drivers of Physician Burnout



Key Insights:

- **40%** of burnout is linked to EHR usability.
- Doctors spend **50%** of time on EHRs, only **27%** with patients.
- ACOs lack tools for efficient pre-visit prep.

Meet Our User: Dr. John Miller



John Miller

Primary Care Physician



Age/Gender
42/Male



Location
San Jose, CA



Clinic Type
Mid-sized private
outpatient clinic

"I want to spend more time with patients – not jumping across tabs. I need relevant history at a glance so I can focus on care, not clicks."

Bio

Dr. John Miller sees 20–25 patients per day, treating everything from diabetes checkups to first-time visits. Despite being efficient and experienced, he often finds himself overwhelmed by the fragmented nature of EHR systems.

He depends on support staff for vitals but must dig through multiple tabs to get patient context. He prefers clean, intuitive digital tools that reduce his cognitive load and help him stay focused on providing quality care.

Pains

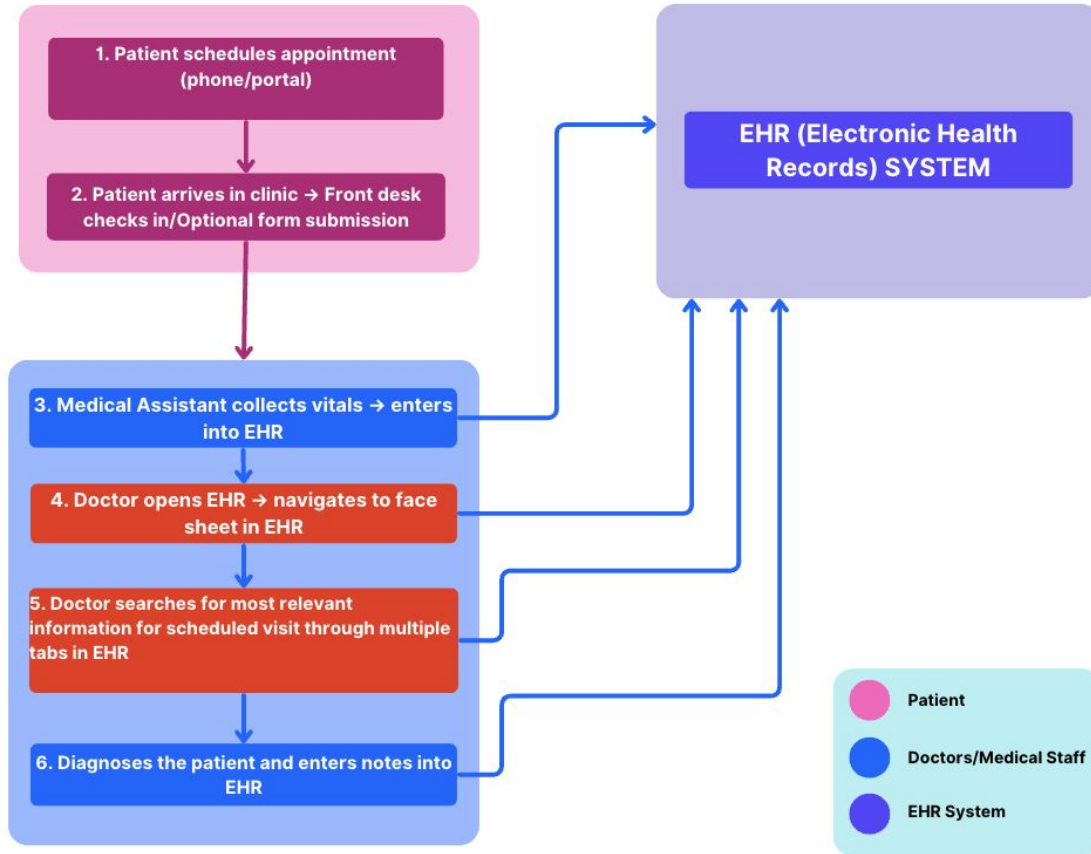
- No summarized view of patient history at the start of visits
- Too many tabs and clicks to access needed information
- High risk of missing key context due to poor layout
- Burnout from EHR fatigue
- Limited time to prepare between back-to-back appointments

Goals

- Access a summarized patient history at a glance before each visit
- Reduce time spent navigating EHR tabs and clicking through fragmented sections
- Increase time available for patient interaction, not screen time
- Feel confident that no important context is missed during prep
- Streamline back-to-back appointments without feeling rushed or disorganized
- Use intuitive tools that complement – not complicate his existing workflow



Current Workflow (Without SmartDoc)



Key Challenges:

- Physicians must manually navigate multiple EHR tabs to locate visit-relevant information
- Lack of a centralized summary leads to fragmented patient context
- Increased cognitive load reduces time available for meaningful patient interaction
- Data entry processes are disjointed between medical assistants and physicians

EHR System Dashboard – What Doctors See Today

Prognosis: A Product By Bizmatix Inc. - Google Chrome
 sales.prognosis.com/prognosis/scrMasterFrame.jsp?isIE=no&width=1351&height=668

West Bay Clinic QPP/PI(MU) updates

Welcome, Marcus Welby (Last Log in 10-26-2021 13:54 PST)

← → Home Appointments Patient CPOE Messages Reports Settings

Appointments Open Encounters Filter Manage Columns Clinical Staff / MA

< Tue 10-26-2021 > 12/19 ☐ Show Telemedicine Appointments Only

Schedule		Patient	Reason for Visit	Visit Status	Room	Visit Type	Process Status
Elk Grove (#16)							
09:00 am		Barnes, Mary	Review labs	Complete		Telemedicine	
09:15 am		Walker, Daisy	Knee pain and diabetes	Ready For Checkout	3	Established Patient Visit	Process D
09:15 am		Hernandez, Jane	Travel consult	Arrived	Room	Telemedicine Established pt	
09:30 am		White, James	Ankle follow up	With MA	2	Office Visit	
10:30 am		Watkins, Mary	Hives	Ready For Checkout	5	Telemedicine - New Patient	
10:30 am		Whitten, Mary	COVID test	Arrived	Room	Office Visit	
11:15 am		Botros, Jane	Discuss meds	Arrived	Room	Telemedicine - New Patient	Process D
02:00 pm		Jackson, Donna	Routine follow up	With Clinical Staff	Room	Established Patient Visit	
02:30 pm		Borges, Anne	PT Consult	Ready For Clinical Staff	9	Physical Therapy	
03:00 pm		Brooks, Martin	Covid Test	Tentative	Room	Covid 19 Test	
03:00 pm		Brooks, Martin	Covid Test	Arrived	10	Covid 19 Test	
03:15 pm		Kelly, Samantha	NPV	Tentative	Room	New Patient	
03:30 pm		Gibson, John	Lab tests	Arrived	Room	Laboratory	
04:30 pm		Renee, Kylie	F/U Strep Throat	Phone Consult done	Bed 27	Telemedicine	Process LC
04:30 pm		Traverso, Nelson	Lab review	Tentative	Room	Follow up - labs	
05:15 pm		Zaffer, Myriah	Follow up from inpatient care	Tentative	Room	Hospital Follow-up	
Mercy Hospital (#3)							

“Snapshot of EHR Dashboard from Prognosis — typical layout used by outpatient physicians”



EHR System Screens – What Doctors See Today

West Bay Clinic QPP/PI(MU) updates

Welcome, Marcus Welby 1 1

Appointments Patient CPOE Messages Reports Settings

Patient Search Walker, Daisy/ Last Visit: 09-30-2021 Insurance Comp.: Aetna ENC Type: Established Patient Visit ENC Date: 10-26-2021 Pat Age(in yrs):56 year Case No.: DOB: 01-01-1965 (female) Attending Provider: Marcus Welby, PT TYPE:

ENCOUNTER REVIEW Patient > Encounter > Face Sheet Face Sheet Default Check All Manage Layouts

Doctor Forms

Order Sheet

Encounter >

Document List >

Face Sheet >

Patient Forms

Vitals

HPI

ROS

Physical >

Procedures

Lab >

Radiology >

Prescription

Education

Assessment

E&M

Progress Notes >

Encounter Close

Enc History < >

☐ **Vaccination**

01-05-2021 Influenza (3 years and up) Administered

☐ **Allergy**

Bee sting [Hives]

Mold

Penicillin [Upset stomach]

Penicillin [hives and upset stomach]

Tylenol [hives]

☐ **PMH (Table | Diagrams)**

Allergies

Back Injuries/Back Pain

DIVERTICULOSIS

Edema

Dizziness

Knee pain, right Since 03-09-2021 M25.561

Hypertension Since 03-09-2021 I10

Asthma Since 03-09-2021 J45.909

Right knee pain Since 03-09-2021 M25.561

Headache Since 03-09-2021 R51

Type 1 diabetes mellitus without complication Since 03-09-2021 E10.9

☒ **Current Medication**

10-26-2021 Allegra-D 12 Hour 60-120 mg oral tablet extended release 12 hr 1 A

10-26-2021 Ambien CR 6.25 mg oral tablet,ext release multiphase 11-05-2021 1

10-26-2021 Actos 45 mg oral tablet 11-25-2021 1 Tablet As Needed for 30 Days

09-30-2021 Actos 30 mg oral tablet 10-30-2021 1 As Needed for 30 Days , Pres

09-30-2021 Lipitor 20 mg oral tablet 10-30-2021 1 Tablet Three Times A Day ple

03-22-2021 Cytomel 25 mcg oral tablet 04-21-2021 1 Tablet As Needed for 30 D

03-22-2021 levothyroxine 200 mcg oral capsule 04-21-2021 1 Capsule As Need

03-22-2021 Synthroid 137 mcg oral tablet 04-21-2021 1 Tablet As Needed for 30

12-01-2020 cyclobenzaprine 10 mg oral tablet 1 Tablet As Needed, Prescribe 1

Aspirin

Lisinopril

☐ **Past Surgical History**

ACL Repair 1986

Breast Lumpectomy 1996

back surgery

Angioplasty

☐ **Social History**

Work History

Health hazards at home: No

Family

Marital Status: Widow

Are you Pregnant?: No

Use of Drugs/Alcohol/Tobacco

Personal Notes

Patient has a caregiver who attends the appointments with her.

☐ **Health Maintenance**

06-25-2025 Cholesterol, Total

09-27-2021 Glucose, Fasting

06-16-2021 EKG

04-01-2020 Colorectal Cancer Screening

04-01-2020 DEXA

04-01-2020 HPV

04-01-2020 Mammogram - Both Breast

04-01-2020 Occult Blood, Feces, Guaiac

04-01-2020 Pap Smear

06-25-2020 Cholesterol, Total Done.

03-09-2021 Controlling High Blood Pressure

☐ **Family History**

Heart Disease - Father

Hypertension - mom

“Snapshot of EHR screens from Prognosis — typical layout used by outpatient physicians”

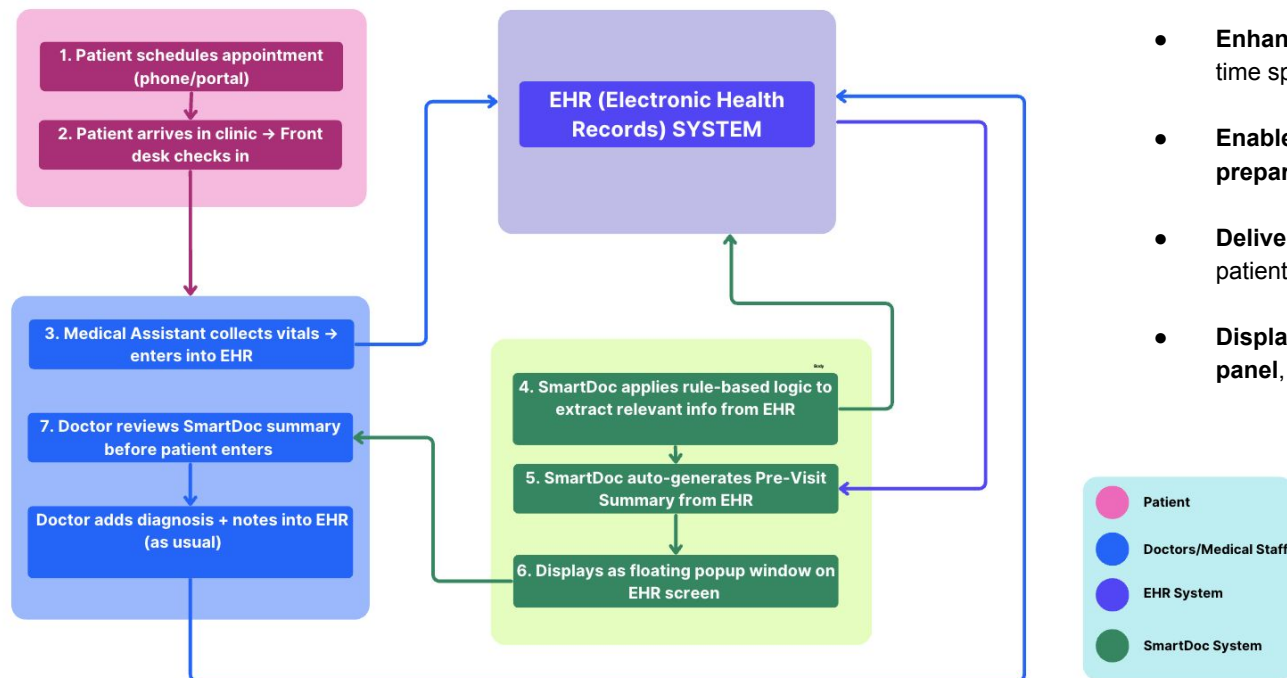


Hypothesis:

“If we provide outpatient doctors with a smart, rule-based pre-visit summary in a floating window during scheduled visits, they can reduce pre-visit preparation time by approximately 25%, experience lower EHR-related cognitive load, and improve the quality of patient care.”



Future Workflow with SmartDoc Pre-visit Summary



Key Improvements:

- **Enhances physician-patient interaction** by minimizing time spent navigating EHR interfaces
- **Enables faster and more effective pre-visit preparation** through access to a consolidated summary
- **Delivers a concise, rule-based one-page summary** of patient information relevant to the visit
- **Displays the summary in a floating, non-intrusive panel**, seamlessly integrated alongside the existing EHR

MVP Solution: SmartDoc One-Page Summary

West Bay Clinic QPP/PI(MU) updates Welcome, Marcus Welby

Patient Search Patient Walker, Daisy/ DOB: 01-01-1965 (female) Last Visit: 09-30-2021 Insurance Comp.: Aetna ENC Type: Established Patient Attending Provider: Marcus Welby

ENCOUNTER REVIEW Patient > Encounter > Face Sheet Face Sheet Default Check All

SmartDoc

Patient: Daisy Walker Visit Today

Reason for Visit
Knee Pain + Diabetes

★ **Highlights:** 3 months ago

- Elevated BP last visit (142/88)
- Recently stopped Lisinopril (noted on refill)
- Family history: Heart Disease (Father)

➕ **Recent Vitals:**

- BP: 148/92 • Wt: 160 lbs (± 2 lbs)
- Temp.: 98.6°F • Pulse: 84 bpm

📖 **Past Medical History:**

- Diabetes Type 2 (since 2010) Asthma
- Back Pain Edema

💡 **Smart Summary:**
"Patient scheduled for chronic condition check-up. BP still elevated post-med change. Recommend labs + resume..."

What Does SmartDoc Summary Include?

- Reason for visit (from patient intake form or from patient portal)
- Current vitals (from MA input)
- Known chronic conditions / red flags (via rule-based triggers)
- Past medications & allergies
- Summary sections grouped logically for quick glance



SmartDoc MVP Feature Planning – MoSCoW Analysis

Mo

- Floating SmartDoc panel overlaying EHR
- Manual Patient Intake Form + Parser
- Rule-based Summary Generator

S

- Manual Vitals & Medication Entry
- Rule-based Alert Engine (e.g., chronic condition flags)
- FHIR/EHR Integration (Planned for Phase 2)

Co

AI-generated Summary Highlights
NLP-driven intake classification
Doctor-specific UI customizations

W

- Voice note summarization or transcription
- Auto-summary from clinical notes

Risk Analysis

Risk ID	Risk Description	Likelihood (1-5)	Impact (1-5)	Risk Score (L * I)	Mitigation Strategy
A1	Doctors ignore SmartDoc, prefer existing flow	5	5	25	Begin with early adopter clinics open to innovation; collect testimonials and measure value through time-saving metrics
T1	Floating panel fails or disrupts EHR	3	4	12	Pre-test on multiple EHR setups; fallback UI mode
U1	Summary too complex to use quickly	3	4	12	Run usability testing; iterate layout
C1	PHI (Protected Health Information) accidentally stored or leaked	2	5	10	No data retention; session-based summary only
B1	Clinics don't see ROI or time savings	3	3	9	Provide performance metrics + testimonials

Scale: 1 (Low) → 5 (High)

Risk IDs:

A = Adoption
 T = Technical
 U = Usability
 C = Compliance
 B = Business

Risk Levels:

1-8 = Low
 9-14 = Medium
 15-25 = High



Distribution Plan – SmartDoc MVP Pilot Strategy

Pilot Clinic Setup:

Partner with 1–2 Northeastern university-affiliated outpatient clinics to serve as the initial pilot environment for SmartDoc

- Doctors are onboarded and shown how to access the floating SmartDoc summary panel
- Patients complete pre-visit intake forms prior to arrival or at front desk
- Medical assistants enter vitals as part of existing workflows
- Doctors review the SmartDoc summary prior to the patient visit
- Post-visit feedback is collected to assess usability, value, and clinical efficiency

Channels:

- Direct outreach to academic clinic administrators and program coordinators
- LinkedIn messaging to physician contacts and clinical innovation leaders
- University-affiliated medical forums or newsletters
- Word-of-mouth referrals from faculty or resident program directors

Goal:

- Validate the MVP in a live clinical setting and generate evidence for future ACO (Accountable Care Organizations) and EHR-integrated phases



MVP Success Metrics – Validation Benchmarks

We will measure MVP success using the following validation criteria:

- **≥ 25% reduction in pre-visit preparation time**

(Measured through direct observation or physician self-reported data (typically targeting a 3-minute reduction per visit).)

- **≥ 80% usage rate**

(SmartDoc summary is utilized in at least 80% of eligible outpatient visits.)

- **≥ 4.0 / 5 average physician satisfaction rating**

(Collected through post-visit surveys or interviews.)

- **1–2 strong physician testimonials**

(Qualitative confirmation of improved pre-visit preparation experience or reduced EHR tab-switching friction.)



THANK YOU

 *Questions? Feedback?*

