Human Systems Integration INNOMED project
General practitioners & Patients

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Agenda

1. **Context**
2. **Methodology**
3. **Problem statement**
4. **Status Quo & Scenario analysis**
5. **Mockup & Solution system**

01

Context

General Practitioners (GP) & Patients relation

FRENCH LANDSCAPE

30% of the French population live in a **"medical desert"** (1)

1.6 M of French **people give up medical care** each year (1)

11% of French people over 17 **have no regular doctor** (1)

- GP are **essential for thorough care** as initial contact for medical concerns
- **Improving the connection** between GP and patients is **crucial** to the healthcare system

Emergence of real **medical deserts & increase in demand for primary care services in urban areas**

- GP are affected by the increasing **number of patients** to treat and the growing **administrative burden**
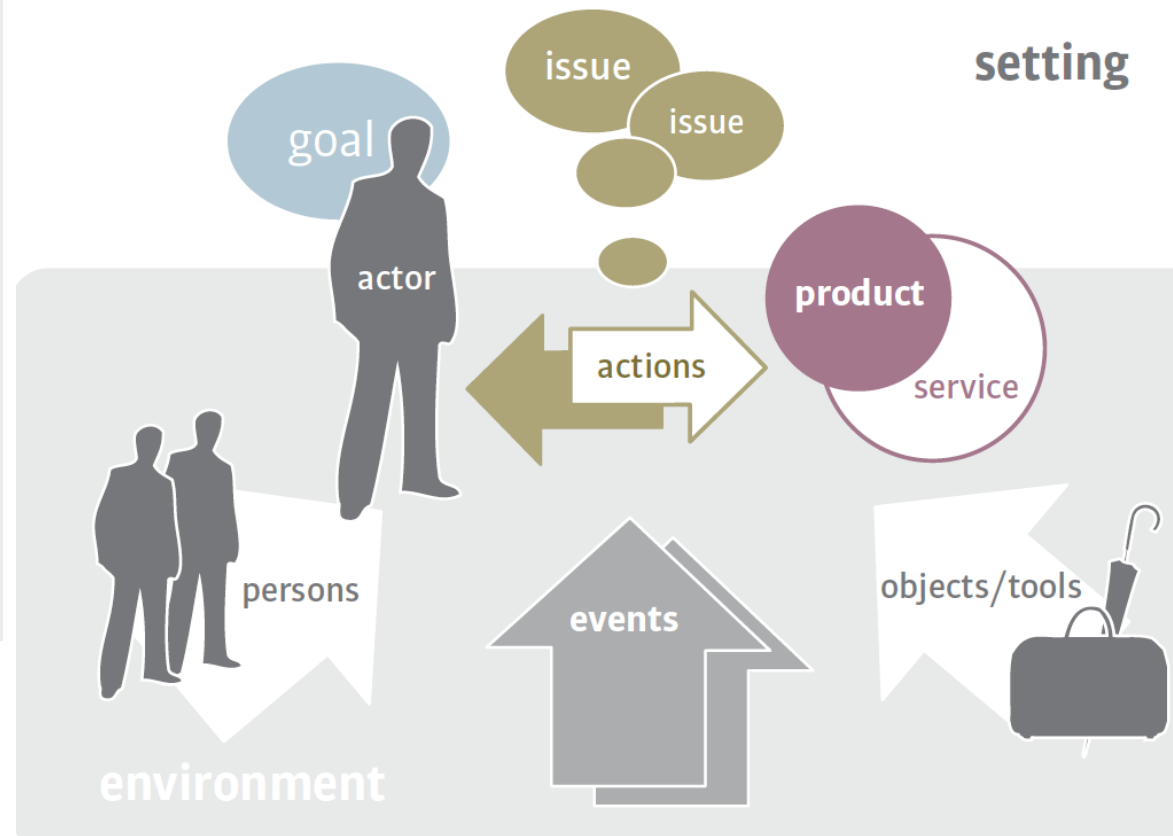
Increasing **wait times for appointments** and **shorter consultation times** negatively impact the quality of care

- **Overcrowding in emergency departments** by patients unable to secure appointments who simply wish to receive treatment.
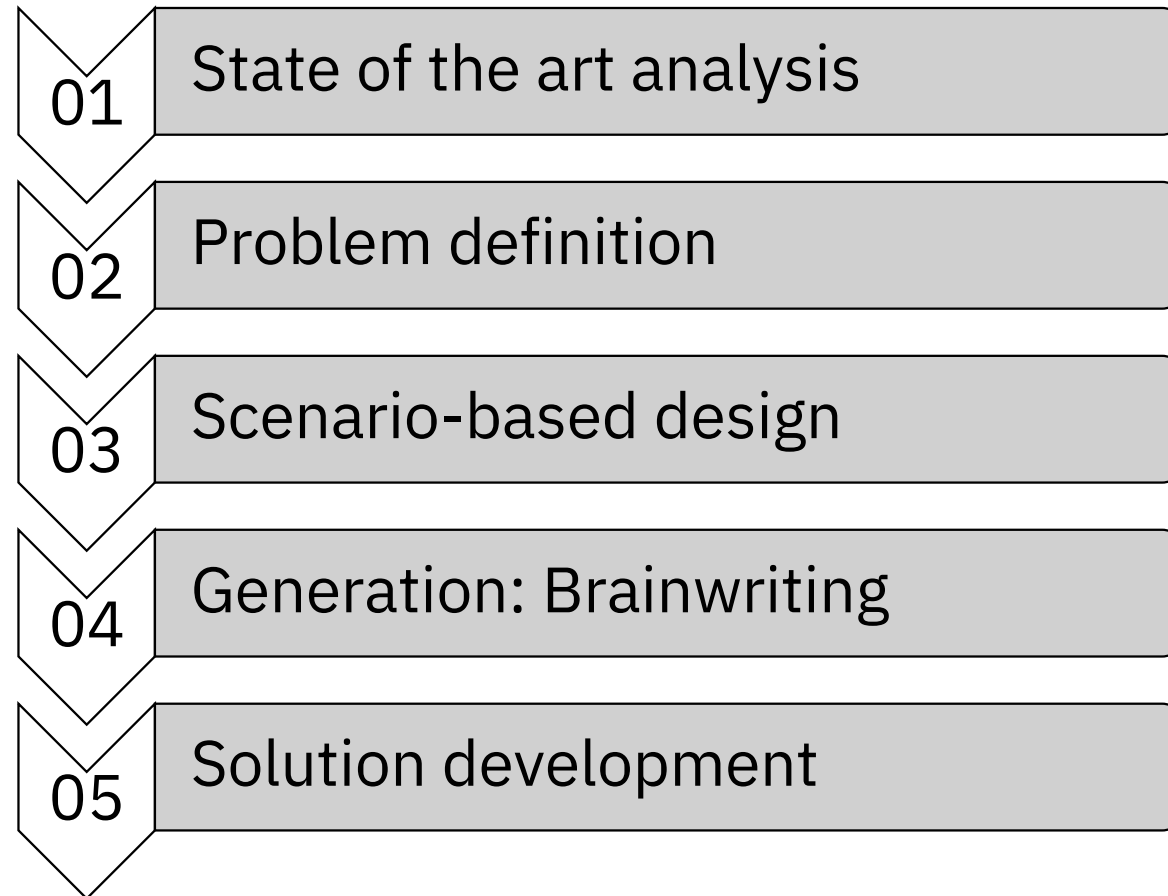
*Our goal is, therefore, to propose a solution that streamlines the **workflow between GPs and patients, with a redesigned system that focuses on effective communication and collaboration** i.e. streamline the patient journey, making it both transparent and efficient*

Methodology

Methodology

01 State of the art analysis

02 Problem definition

03 Scenario-based design

04 Generation: Brainwriting

05 Solution development

03

Problem statement

Problem statement

TWO SET OF PROBLEMS

Enhancing the relationship between GPs and patients in France by addressing the inefficiencies and lack of awareness surrounding the process of accessing and utilizing GP services

Case 1: Finding a GP and having a proper consultation

Context: Individuals struggle when seeking to locate and schedule appointments with GPs effectively, and are often disappointed by some aspects of appointment

Goal: Solutions to ease process of finding a suitable GP (according to the patients' expectations), as well as simplifying the appointment scheduling process

Status Quo: The existent solutions don't sufficiently satisfy the needs for this population. The solution will focus on proposing new ideas to upgrade current system

Case 2: Managing visits to GP and medical documents

Context: Patient-GP interaction involves many administrative tasks and documentations, which leads to inefficiencies and confusion for both parties

Goal: Better communication and management of visits to GP, including the handling of documents and medical records

Status Quo: The existent solutions satisfy the needs but are not well-spread amongst the population. The solution will focus on raising awareness to people

Problem statement

TWO SET OF PROBLEMS

Enhancing the relationship between GPs and patients in France by addressing the inefficiencies and lack of awareness surrounding the process of accessing and utilizing GP services

Case 1: Finding a GP and having a proper consultation

How can technology be leveraged to **streamline the process of finding a suitable general practitioner and scheduling appointments?**

Case 2: Managing visits to GP and medical documents

What strategies can be implemented to **improve communication channels and raise awareness to document management systems between GP and patients?**

04

Status Quo & Scenario analysis

1. **Assessing current solutions**
2. **Describing the process**
   a. Patients' point of view for finding a GP
   b. Process overview for all stakeholders
3. **Developing AS-IS Scenarios**
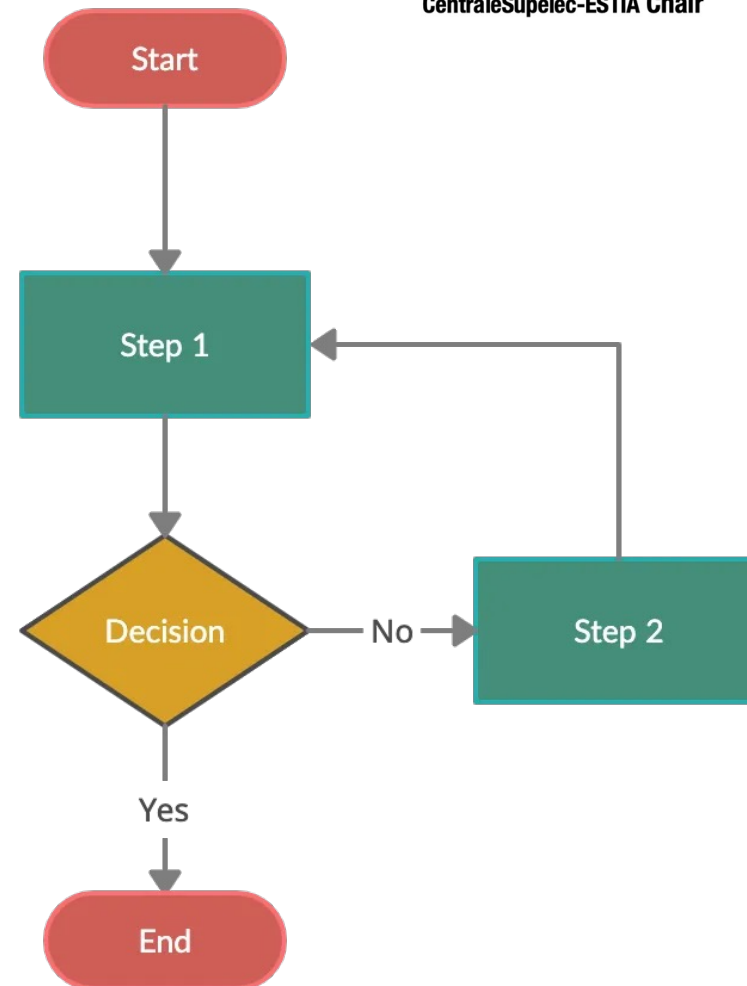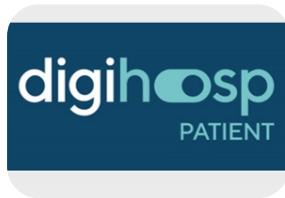
Assessing existing solutions

ADMISSION INTO CLINIC

Fast-track the admission process by making the documentation required available to the clinic before the patients' arrival.

Appfine

Digihosp

APPOINTMENT MANAGEMENT

Online scheduling for medical appointments.

Doctolib

Medicalib

PERSONAL DOSSIER

Store online patients' documentation related to medical care to ensure availability and treatment traceability.
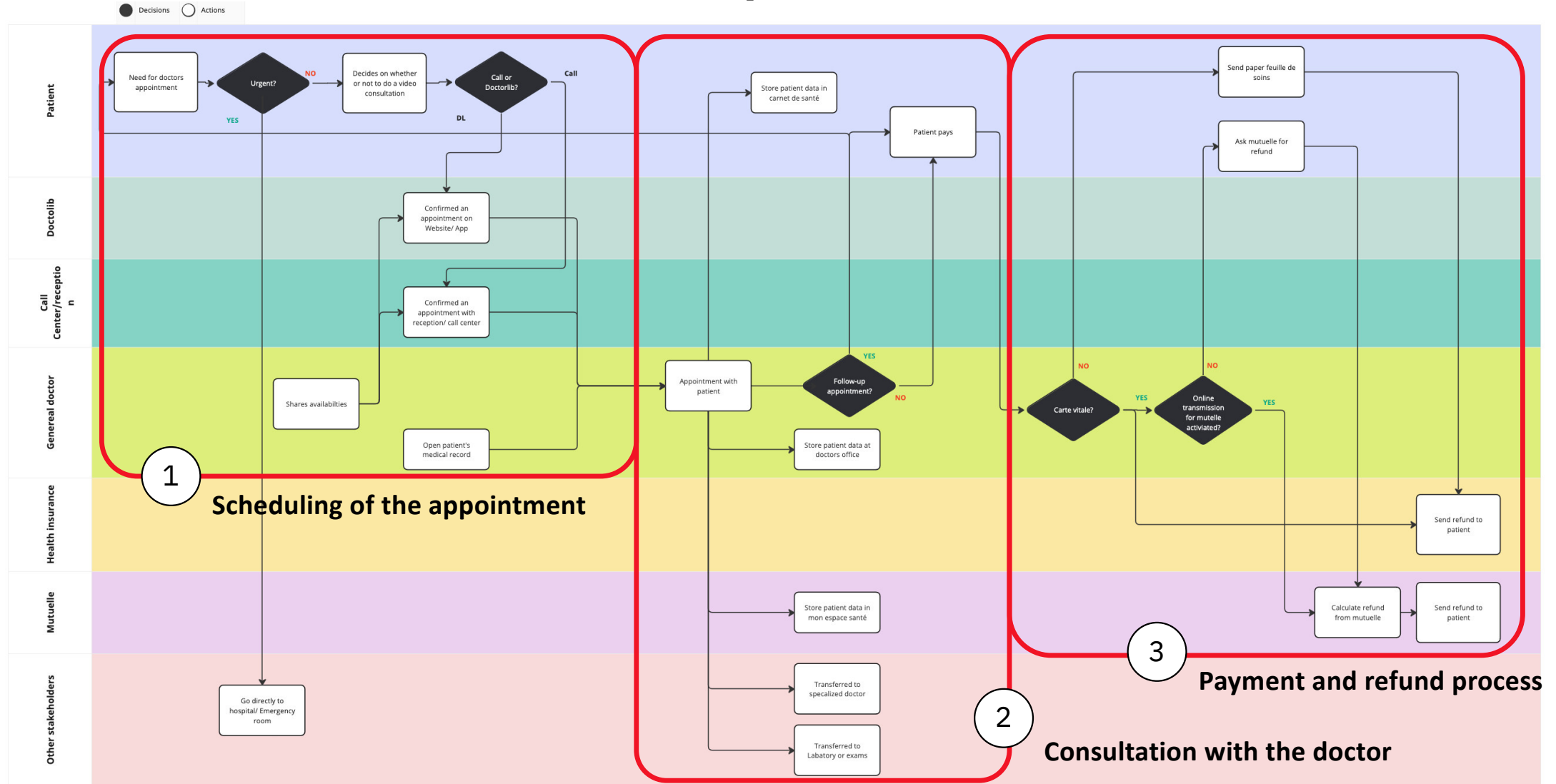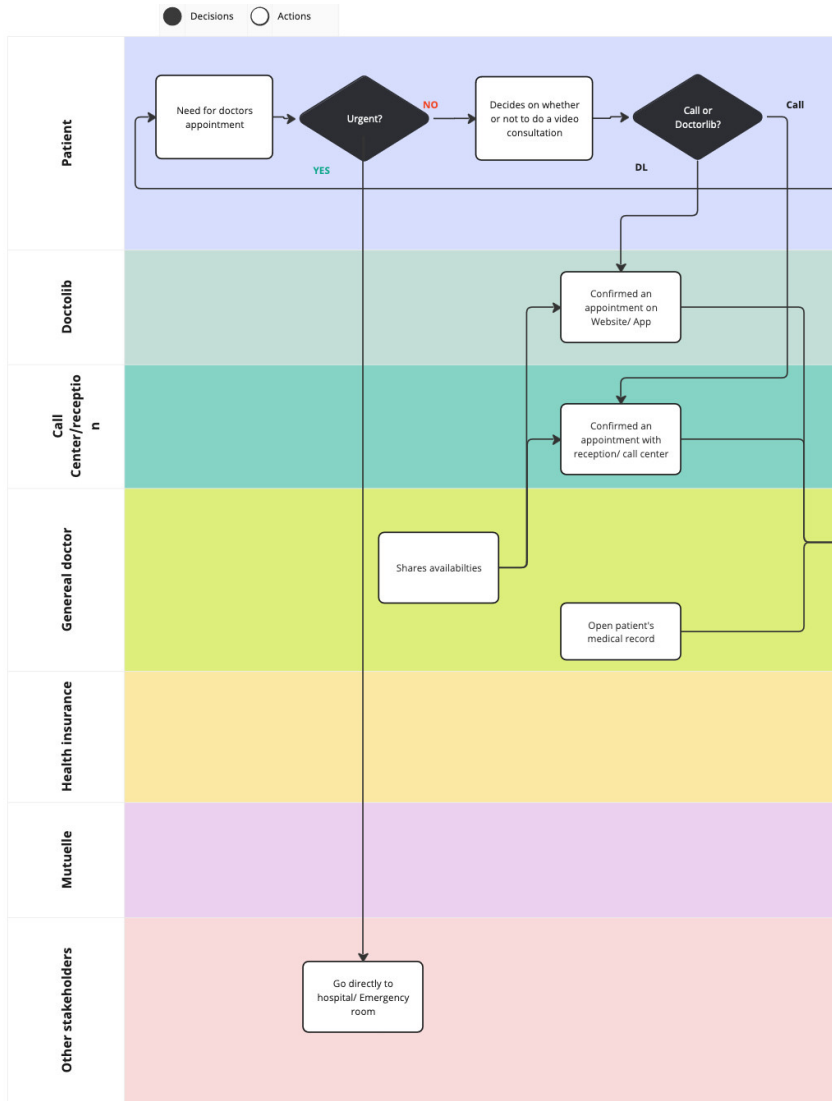
ID-U Santé

Mon Espace Médicale

Overall, solutions **work properly** and could have the capability to counter some of the identified pain points. However, they are **not well known nor used**, limiting the reach of the benefits they provide.
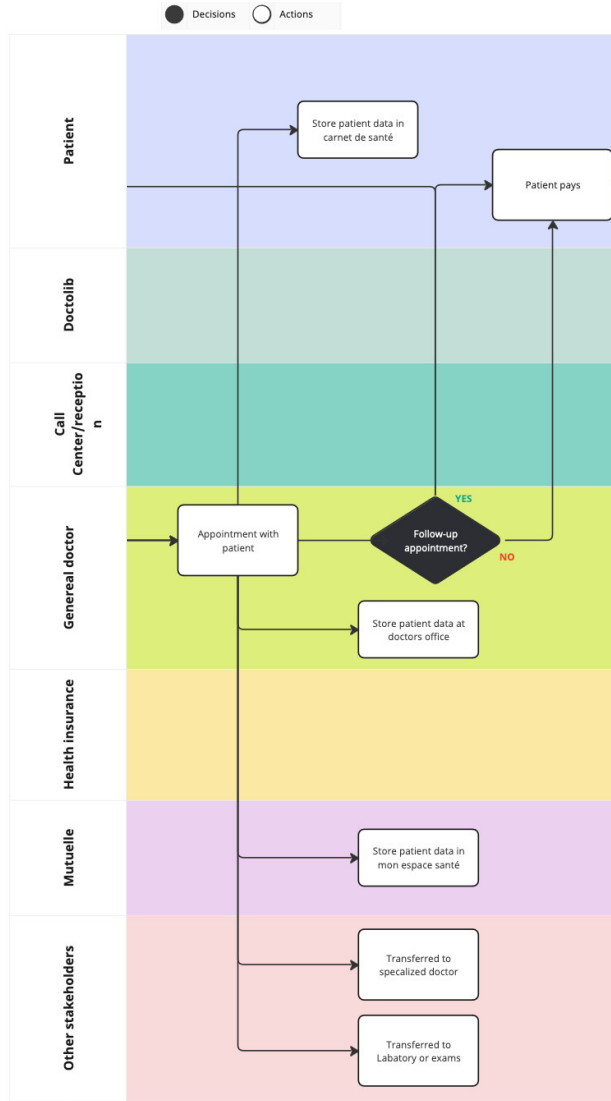
Stakeholder interaction in current process

Stakeholder interaction in current process – Zoom phase 1

1 **Scheduling of the appointment**

- Urgent appointments are directed to Hospitals
- Patients decide on video or in-person consultation

Stakeholder interaction in current process – Zoom phase 2

2 **Consultation with the doctor**

- Reasons for the consultation include:
  - Need for immediate care
  - Need for a certificate
  - Need for preventative care (e.g., vaccination)
  - Need to refer to other healthcare providers (e.g., laboratory, specialist)
- After the patient is transferred, potentially a follow-up appointment
- Patient data is stored in various places

Stakeholder interaction in current process – Zoom phase 3
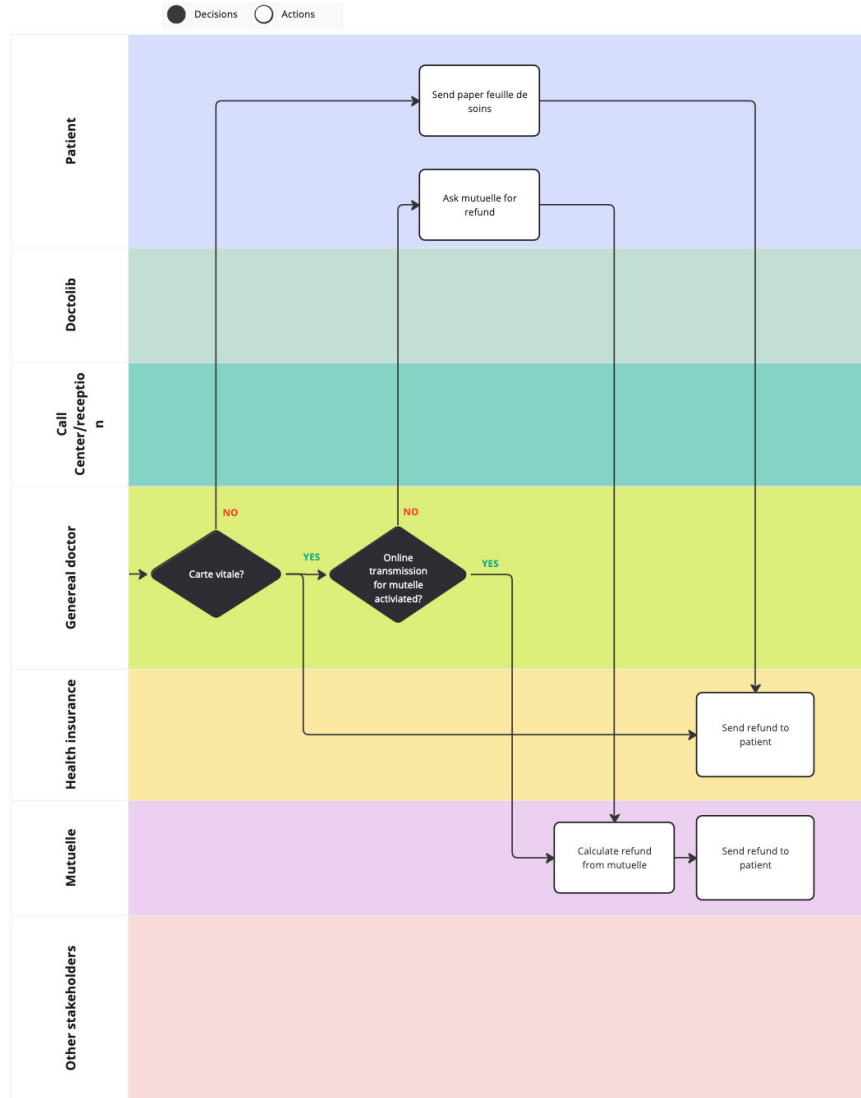
(3) **Payment and refund process**

- After the consultation, the patient pays and gets refunded based on his health assurance and complement

- Online transmission allows for simple data transfer and automatic reimbursements

- An analog process via the mail needs more patient interaction to get the consultation reimbursed

# Patient's point of view for finding a general practioner
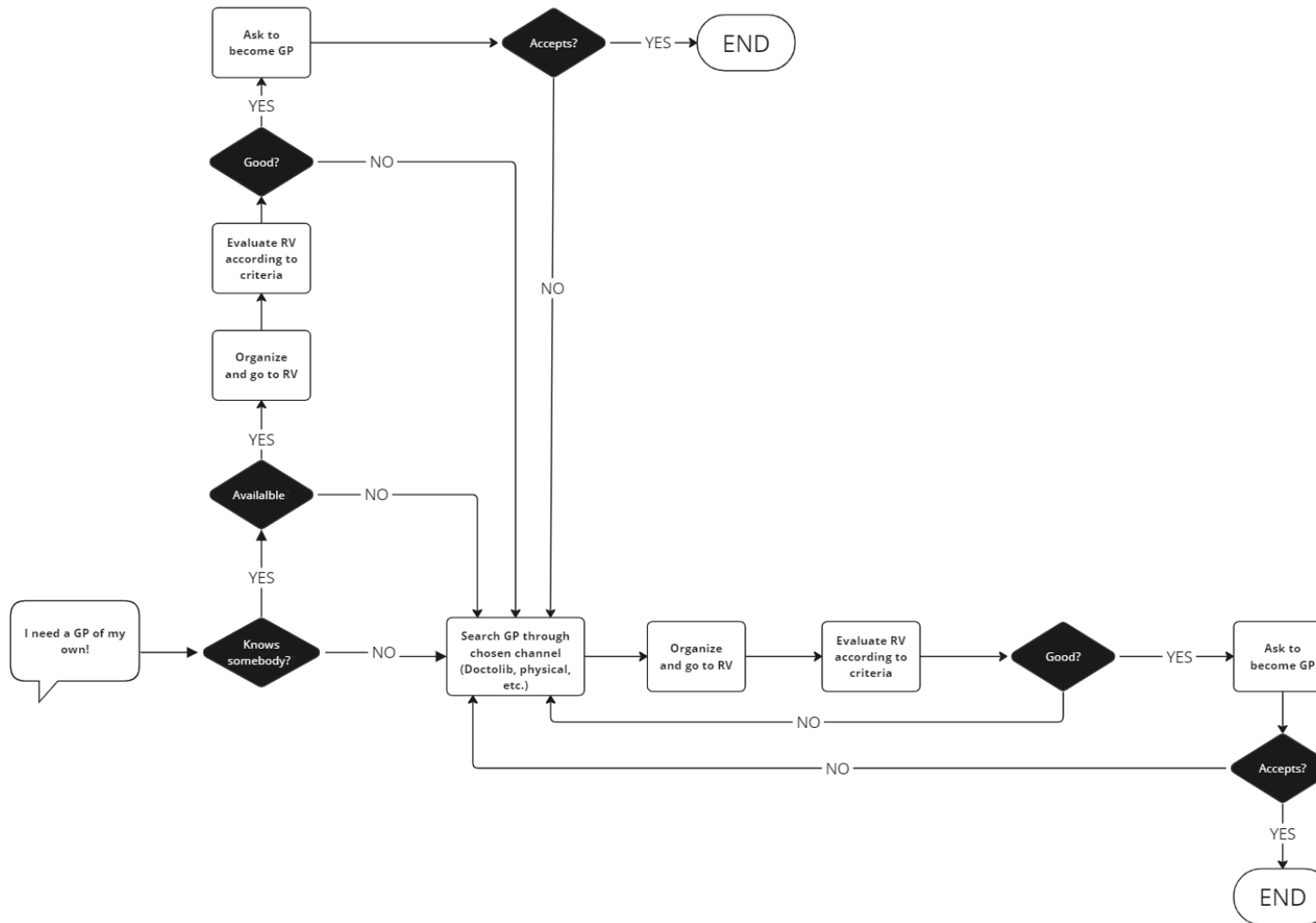
Julie, 24 years old, was born in Lyon. She is studying now at CentraleSupélec at the Saclay Campus but she is moving to Marseille to do her internship.

Every time she is in a new city she has to search for a generalist practitioner to have a gynecologist follow-up, or to receive a prescription for ordinary medicines, or even just to take a sick leave certificate for School.
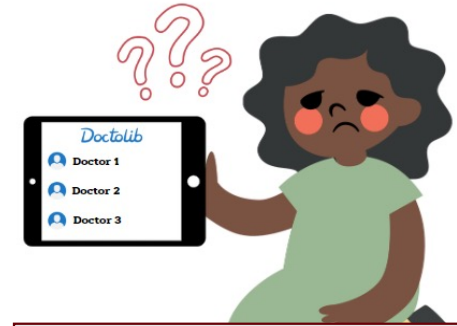
That classifies as a problem because every time she has to look into the Doctolib application, it's difficult to find a doctor that suits her needs and expectations without recommendation from others.

When she goes to the consultation, in general, she doesn't know what to expect in terms of time, service method and treatment pathways, and this often leads to a very unsatisfactory consultation.
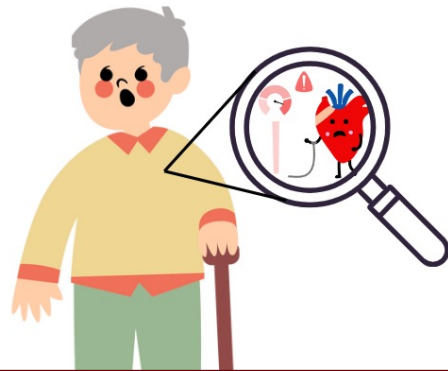
Therefore, she must look for another doctor and do all this cycle again until she finds one that meets her specific needs.
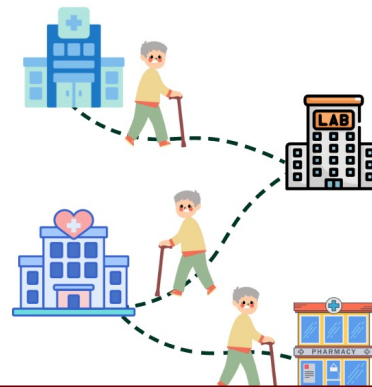
She already did this one time moving to college, and now she has to do this again, knowing how painful it will be.

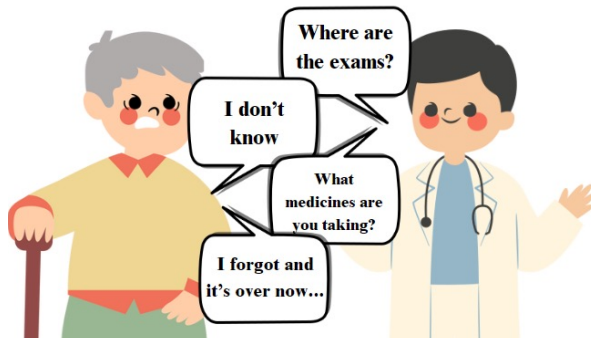## CASE 2-MANAGING VISITS TO GP (DOCUMENT MANAGEMENT)

Marc, 68 years old, lives in Paris. In a recent appointment with a generalist doctor, he discovered that he potentially has hypertension.
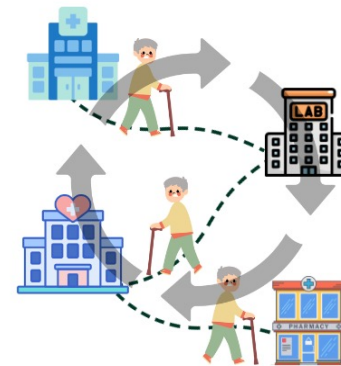
Therefore, the doctor prescribed a lot of blood test and referred him to a cardiologist. He took the blood test and went to the cardiologist, who gave him a pharmacy prescription.

Two months later, He was still suffering from the symptoms and went back to the generalist practitioner.

Where are the exams?

I don't know

What medicines are you taking?

I forgot and it's over now...

The doctor couldn't find his latest blood tests because they weren't in the database and the paper was left with the cardiologist, he also don't remember the name of the medication he is on and this data it is not available in the data base.

So he'll have to go through the tests and to the specialist again, which means a loss of money and time.

Wrap up of paint points for the scenarios

SCENARIO I: FINDING A GP AND HAVE A PROPER CONSULTATION

- Scheduling is not respected while appointments are rushed
- Difficulty obtaining an appointment without using digital channels (Doctolib, etc.)
- Cultural and linguistic differences
- Need to independently reschedule follow-up appointments
- GPs are very busy

SCENARIO II: MANAGING VISITS TO GP (DOCUMENT MANAGEMENT)

- Unclear communication
- Difficulties when managing documents among different medical stakeholders
- Impossible to contact the doctor if patient has follow-up questions

05

Mockup &
Solution system

1. **Case 1** - Finding a GP and having a proper consultation

2. **Case 2** – Managing visits to GP and medical documents

FlexTech

CentraleSupélec-ESTIA Chair

Mockup & Solution system

Case 1 - Finding a GP and having a proper consultation

"New in Town" (NiT) Feature

5 PROPOSED INTERFACES: HOMEPAGE, FAQ, FORUM, CHATBOT, REVIEWS

Rather than developing an app from zero, NiT is to be
integrated in any appointment scheduling app.

"New in Town" Feature
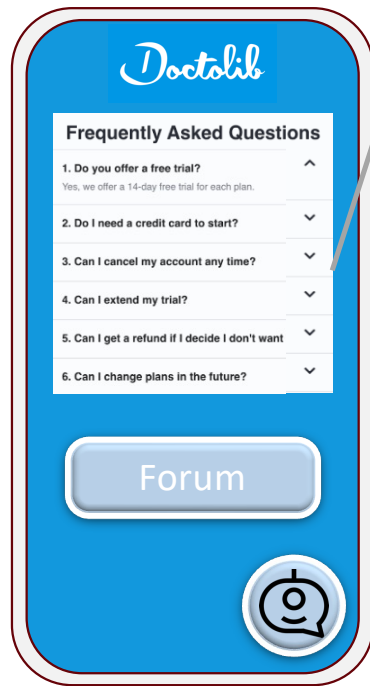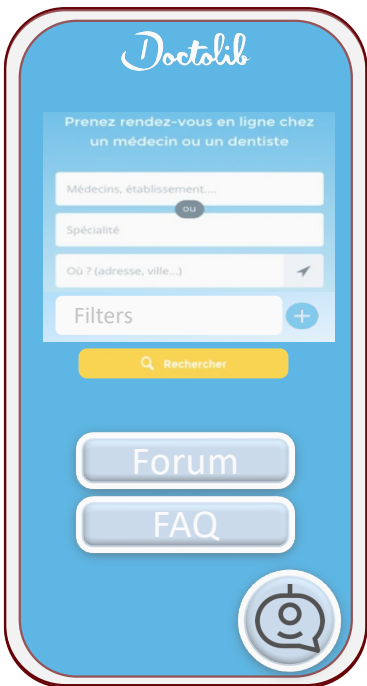
HOMEPAGE WITH ADVANCED FILTERING

New filters
- Refund type
- Availability to take new patients
- Language
- Reviews' score
- Gender preference

Direct access to the specified sections, clearly shown on the homepage.

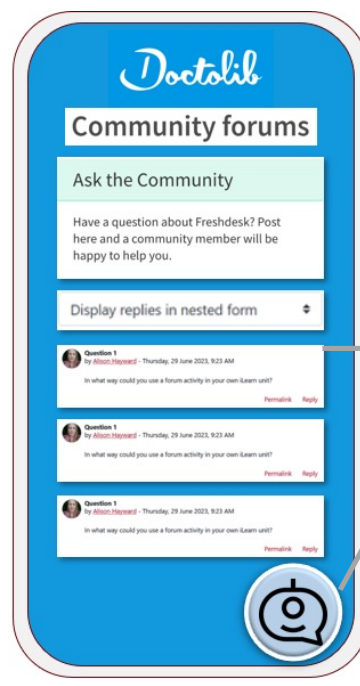Chatbot on display, if any specific doubts arise

"New in Town" Feature

COMMUNITY FORUM

Most frequent questions already answered.
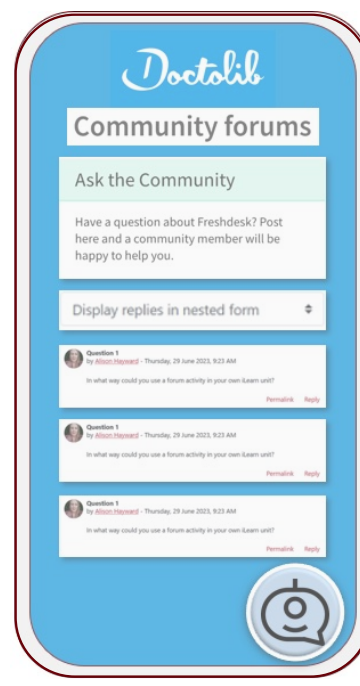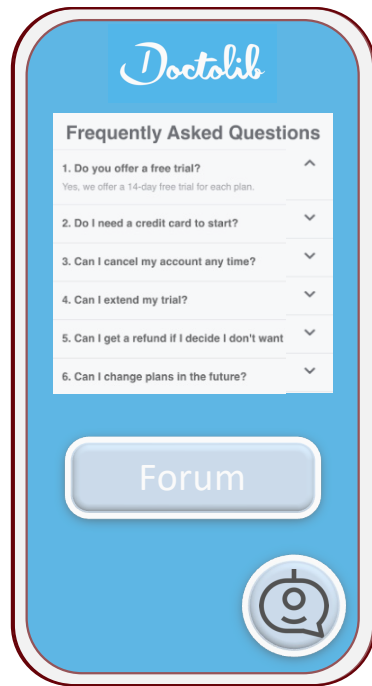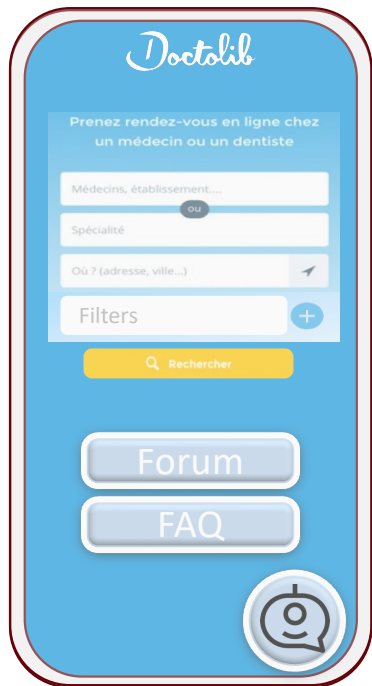
If you couldn't find what you were looking for, you can go ask to other users in the forum or ask the chatbot.

"New in Town" Feature

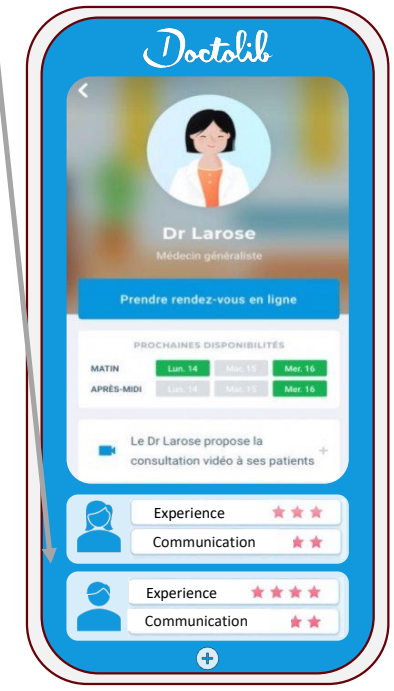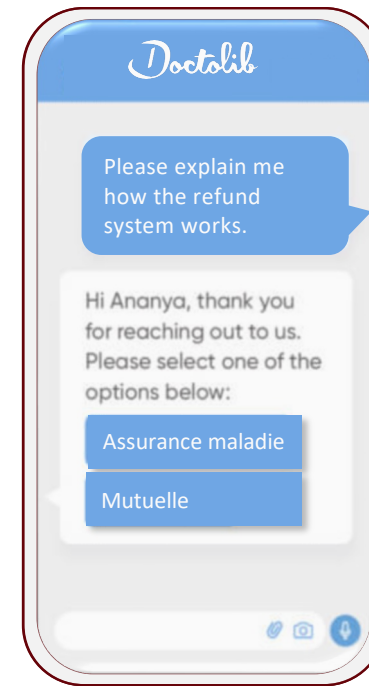## CHATBOT
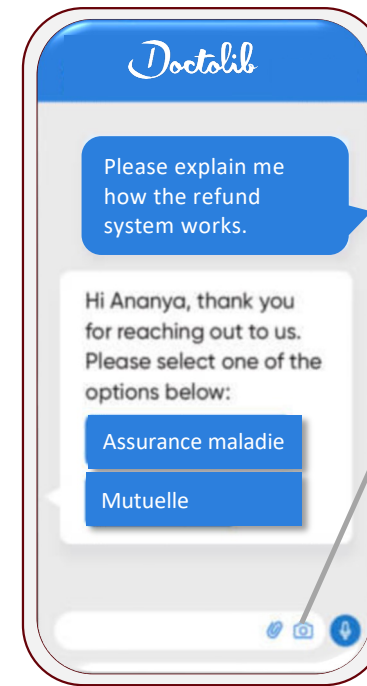
If you couldn't find what you were looking for, you can go ask to other users in the forum or ask the chatbot.

"New in Town" Feature

REVIEWS

Reviews by other patients and possibility to add own opinion on consultation

Julie, 24 years old, was born in Lyon. She is studying now at CentraleSupélec at the Saclay Campus but she is moving to Marseille to do her internship.

Every time she is in a new city she has to search for a generalist practitioner to have a gynecologist follow-up, or to receive a prescription for ordinary medicines, or even just to take a sick leave certificate for School.

But this is not a problem anymore because now, when she opens the app's feature "New in Town", she can filter doctors by reviews as well as being able to carry out a generalist search through the app's FAQ, pose specific questions and shared experiences with other patients on the Forum and ask for help for the chatbot.xw

This return from other patients and the use of filters improves a lot her experience in the consultation because now she knows what to expect.

In addition, as there is an explicit system for evaluating doctors, they are encouraged to provide the best possible care, improving also the experience

This way, the process of finding a doctor is no longer a point of stress when moving cities.

Process mapping: How does it work?
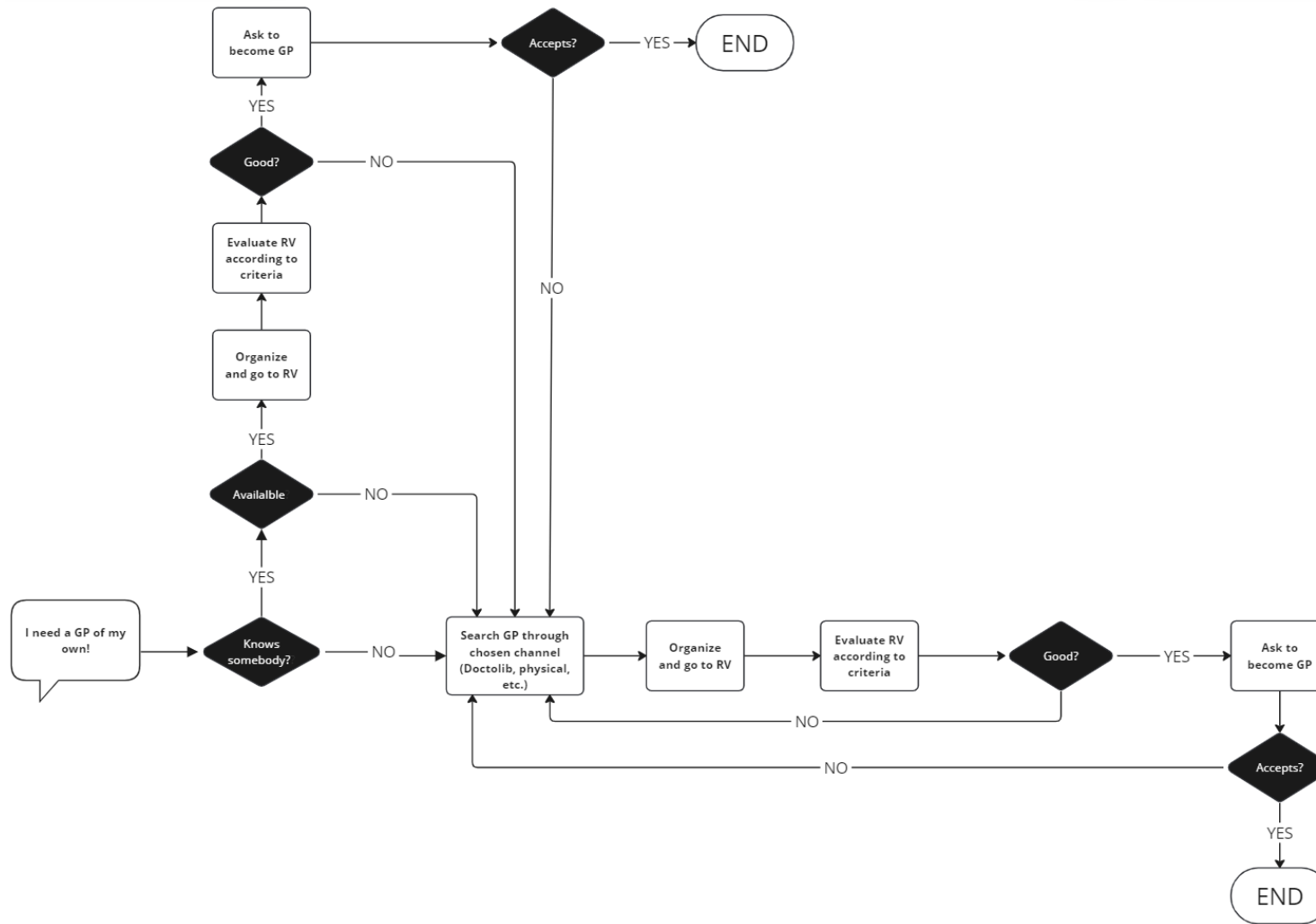
Process mapping: Status Quo
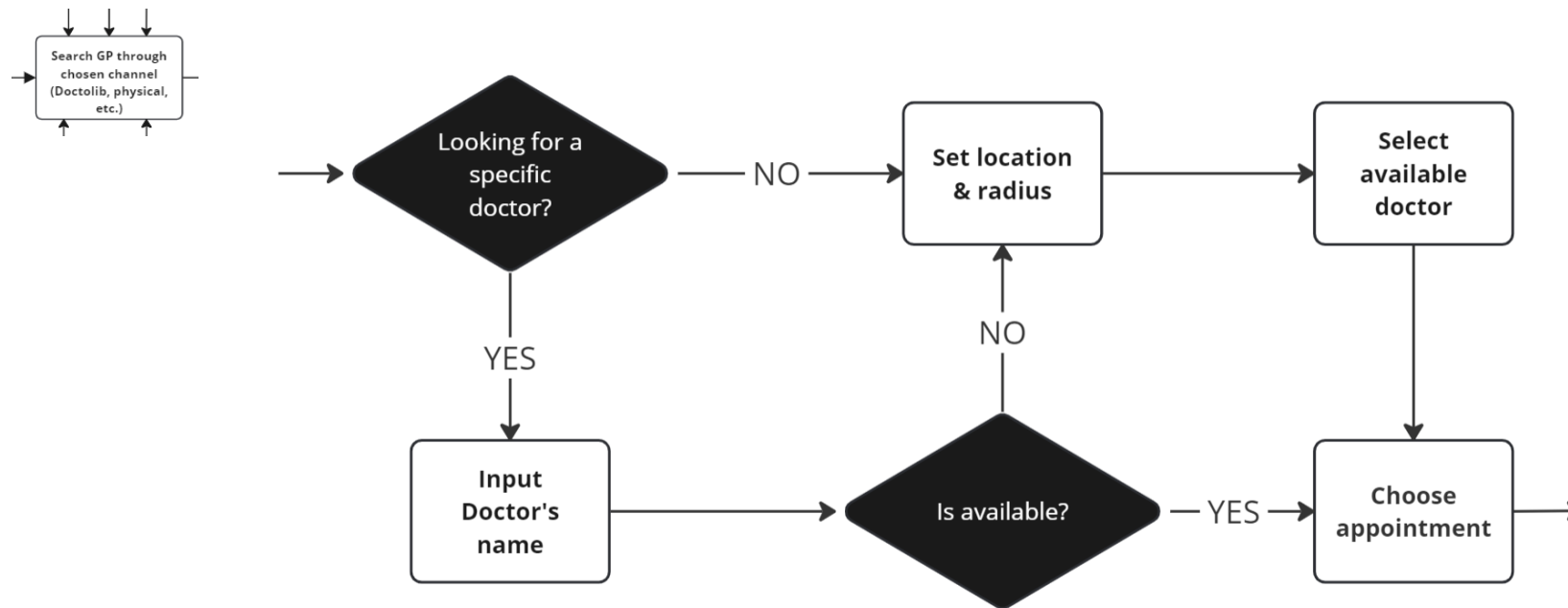
Process mapping: Solution proposal
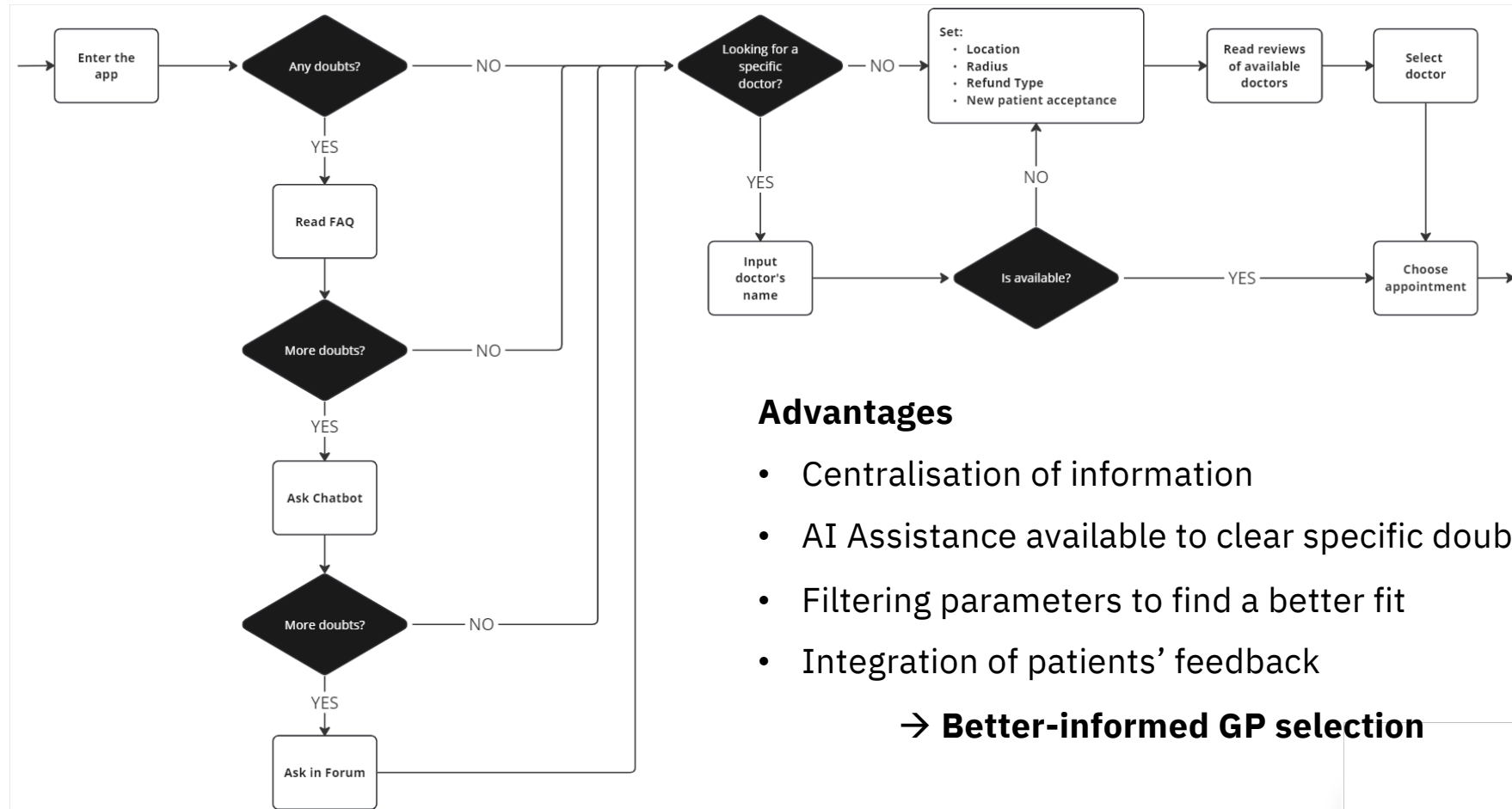
Advantages

- Centralisation of information
- AI Assistance available to clear specific doubts
- Filtering parameters to find a better fit
- Integration of patients' feedback

→ **Better-informed GP selection**

FlexTech
CentraleSupélec-ESTIA Chair

CentraleSupélec

Mockup & Solution system

Case 2 - Managing visits to GP and medical documents

"New in Town" Feature

SENSIBILIZATION CAMPAIGN

Two actors:

The public health system & platforms companies

- Use the public budget to participate in the campaign
- Development of a multi-channel communication (TV, Social media, boards, letters, ...)
- A special campaign would target directly medical staff
- Ask GP and other medical staff to incentivise their patients

Example of a campaign board

SCENARIO TO-BE

CASE 2-MANAGING VISITS TO GP (DOCUMENT MANAGEMENT)

Marc, 68 years old, lives in Paris. In a recent appointment with a generalist doctor, he discovered that he potentially has hypertension.

Therefore, the doctor prescribed a lot of blood test and referred him to a cardiologist. He took the blood test and went to the cardiologist, who registered his results in the system because he is constantly encouraged by the public system to use the available platforms and gave him a pharmacy prescription.

I know how to do it because I saw the tutorial on TV

Marc registered the name and details of his medicines in his platform's personal space because he saw how to do it in a break of a TV show.

Two months later, He was still suffering from the symptoms and went back to the generalist practitioner.

Where are your exams and your medication?

In my Space Santé

The doctor could find his latest blood tests and the details of his medications because everything was in the database.

So the consultation was much more efficient, optimizing the time of the patient and the doctor.

06

Conclusion

Two problems, two approaches

Enhancing the relationship between GPs and patients in France by addressing the inefficiencies and lack of awareness surrounding the process of accessing and utilizing GP services

Case 1: Finding a GP and having a proper consultation	Case 2: Managing visits to GP and medical documents

Proposition → "New in Town" Feature

Advantages

- Centralization of information
- AI Assistance available to clear specific doubts
- Filtering parameters to find a better fit
- Integration of patients' feedback
  - ➤ More transparent process
  - ➤ Better-informed GP selection

Proposition → Marketing campaign

Advantages

- Increased visibility
- Low-cost solution compared to developing from zero
- Utilization of already-existing resources & solutions
  - ➤ Time optimization
  - ➤ Immediate possibility to profit from existing solutions

Merci pour votre attention!

07

Annex
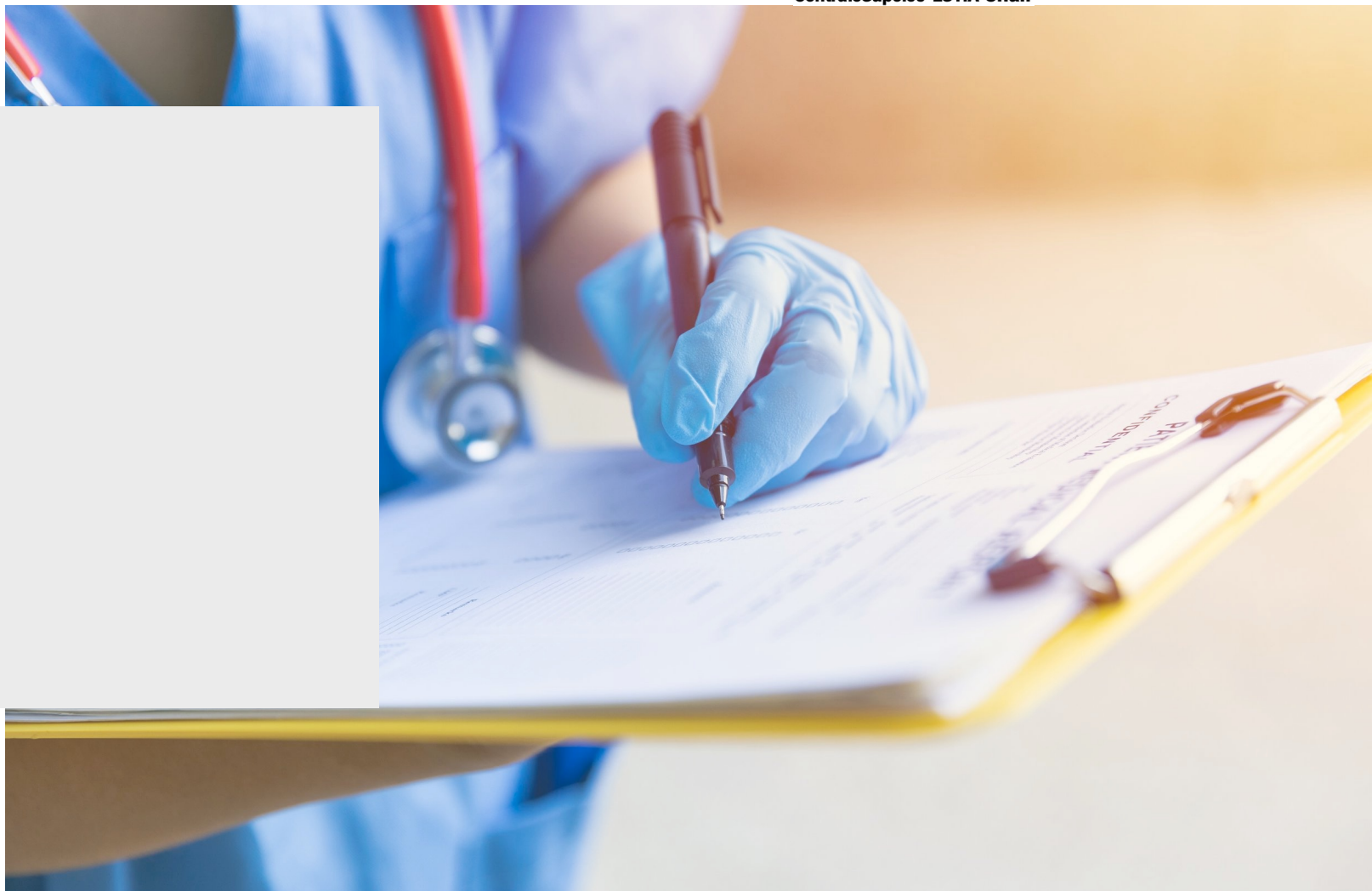
Interviews

6 INTERVIEWEES, ALL IN THE SAME SITUATION OF "NEW TO THE CITY", MOST OF THEM INTERNATIONAL, ANSWERED A FORM OF QUALITATIVE AND QUANTITATIVE QUESTIONS

	Questions	Average
QUANTITATIVE	On a scale of 1 to 5, how would you rate your experience when seeking a doctor for the first time	2
	How many doctors did you consult before finding one you felt comfortable with or suitable for your needs?	3
	Do you consider it important for doctors to have access to your complete medical history during the consultation?	Yes

	Questions	Examples of answers
QUALITATIVE	How did you feel when seeking a doctor for the first time	"I was anxious about finding a doctor I could trust"
	What were the main challenges you faced when seeking a doctor?	"Availability" "Find reviews about the doctor" "Finding a doctor with availability that fit my schedule was difficult"
	What would you like to know about a doctor before scheduling an appointment?	"duration of consultation" "details about payments" "communication and assertiveness"
	Have you had previous experiences where centralization of medical documents facilitated your appointment with a doctor?	"I'm not sure, as I've never had my medical records centralized, but I believe it could streamline the process"

Bibliographie

- [French National Academy of Medicine (2023)](#)
- [Sécurité sociale](#)
- [Santé publique France](#)
- [Health link](#)
- [Doctolib](#)
- [Medicalib](#)
- [Le système de santé en France](#)

Problems mapped

AFTER BRAINSTORMING & SCENARIOS, MAIN PROBLEMS WERE CATEGORIZED

Category	Problems identified	Consequences
Information about the clinic	• No rating system • No profile photo • No photos of the clinic	• Lack of confidence • Loss of attractiveness of the profession
Information management & making the appointment	• Difficulty obtaining an appointment without using digital channels (Doctolib, internet, etc.) • Need for an appointment for each stage of the same consultation • GPs are very busy	• Long delays in obtaining treatment • Complications for people not used to the system
Consultation	• Appointment times not respected, Overlapping • Cultural and linguistic differences • Communication not clear • Rushed appointments • Impossible to contact the doctor if patient has follow-up questions	• Uncertainty in patient time management • Distant relationship between GP-patient • Lack of trust
Availability	• Shortage of GPs • Uneven distribution across the country • Difficulty in obtaining follow-ups • Delays in submitting imaging reports • Reduced staff at night and on holiday	• Rural areas are being neglected • Some doctors are overwhelmed • Waste of time for patients • Some patients do not seek treatment/not treated on time

Scenario AS-IS

CASE 1 - FIND A GP AND HAVE A PLEASANT CONSULTATION

Julie, 24 years old, was born in Lyon. She is studying now at CentraleSupélec at Saclay's Campus but she is moving to Marseille to do her internship. Every time she is at a new city she has to search for a generalist practitioner to have a gynecologist follow-up, or to receive a prescription for ordinary medicines, or even just to take a sick leave certificate for School. That classifies as a problem because every time she has to look into Doctolib application, it's difficult to find a doctor that suits her needs and expectations without recommendation from others. When she goes to the consultation, in general, she doesn't know what to expect in terms of time, service method and treatment pathways, and this often leads to a very unsatisfactory consultation. Therefore, she must look for another doctor and do all this cycle again until she finds one that meets her specific needs. She already did this one time moving to university, and now she has to do this again, knowing how painful it will be.

Scenario TO-BE

CASE 1 - FIND A GP AND HAVE A PROPER CONSULTATION

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Scenario AS-IS

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Already existing solutions for the problems

- EXPLAIN WHAT IS COVERED BY DOCTOLIB
- WHAT IS COVERED BY CARNET DE SANTÉ (MON ESPACE SANTÉ)

Admission into clinic
- Appfine
- Digihosp

Appointment management
- Doctolib
- Medicalib

Personal dossier
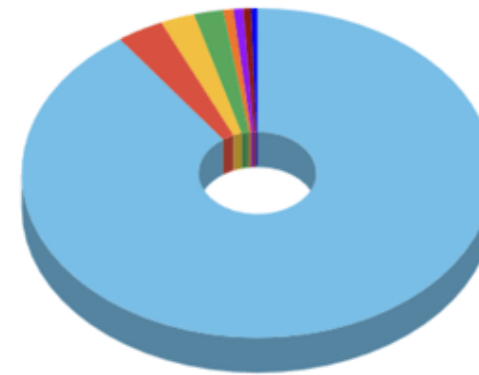- ID-U Santé
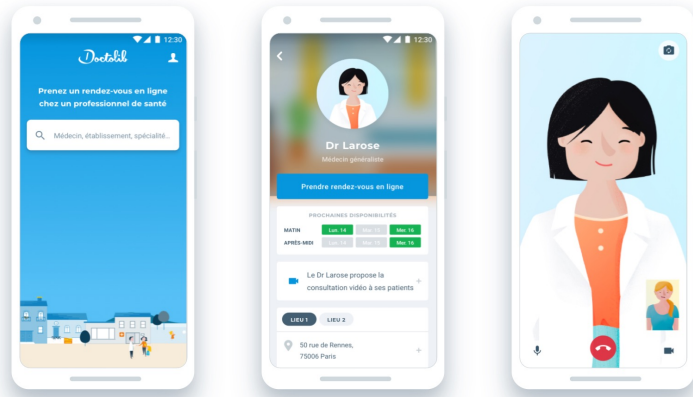
Plateformes commerciales de rendez-vous médicaux en ligne : taux de couverture national

Professionnels de santé : 81631

- DOCTOLIB - 90,08% (73532)
- CLICRDV - 3,24% (2642)
- KELDOC - 2,34% (1909)
- MAIIA - 2,01% (1640)
- RDV MÉDICAUX - 0,69% (562)
- DOC AVENUE - 0,68% (558)
- PRENDRE MON RDV - 0,53% (431)
- PRENDRE UN RENDEZ-VOUS - 0,44% (357)

Doctolib

Book an appointment
1. Log in to your Doctolib account.
2. Select a specialist in your area.
3. Choose between physical and video consultation.
4. Share documents before your consultation.

Physical

Video

Getting to the clinic on D-Day

Possibility of converting physical appointment to video

Log in on D-Day
- Link by e-mail or SMS 10 minutes before your appointment.
- Same price as a face-to-face consultation.

Retrieve your documents
- Access your prescriptions from the "Documents" tab.
- You can share them directly with your pharmacy.

SWOT

- **Strengths:**

1. **Market Leader in France:** Doctolib is the leading platform for online medical appointments in France, holding a significant market share.

2. **Wide Range of Practitioners:** The platform offers a diverse range of healthcare practitioners, enhancing its value proposition for users.

3. **Technological Innovation:** Doctolib offers innovative features such as video teleconsultations and administrative management tools for practitioners, improving the efficiency and accessibility of healthcare.

4. **User-Friendly Interface:** The platform's user-friendly interface makes appointment scheduling easy for patients and simplifies appointment management for practitioners.

- **Weaknesses:**

1. **Dependency on Third-Party Hosting Services:** Doctolib relies on Amazon Web Services (AWS) for data hosting, raising concerns about data privacy and security.

2. **Digital Divide:** A portion of the population, especially the elderly, remains excluded from using the platform due to the digital divide, limiting its accessibility.

- **Opportunities:**

1. **International Expansion:** Doctolib can expand its operations to other European or international markets where the demand for online healthcare services is growing.

2. **Continuous Innovation:** By investing in research and development, Doctolib can continue to introduce new features and improve its services to remain competitive in the market.

3. **Strategic Partnerships:** Collaborating with other players in the healthcare or technology industry can open up new growth and innovation opportunities.

- **Threats:**

1. **Increased Competition:** Competition in the online healthcare services sector is increasing, with the emergence of new startups and large tech companies entering the market.

2. **Government Regulations:** Evolving regulations in the healthcare and technology sectors could impact Doctolib's operations and its ability to comply with current standards.

3. **Data Privacy Risks:** Growing concerns about data privacy and security could lead to a loss of user and practitioner trust, potentially damaging the platform's reputation.
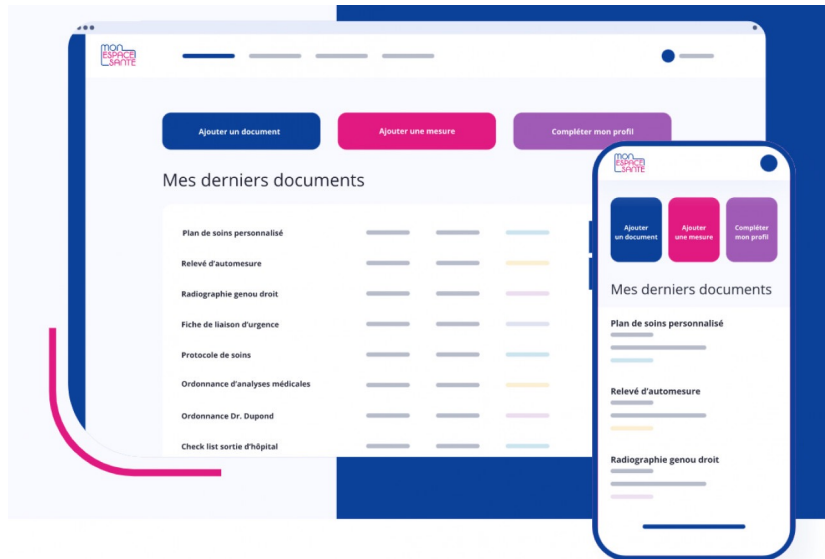
A digital platform for managing health information.

- **Personal Health Profile:** Input and share medical history details securely.

- **Health Documents Repository:** Store, categorize, and access medical documents easily.

- **Health Messaging:** Secure communication with healthcare professionals.

- **Service Catalog:** Access trusted digital health services recommended by the government.

- **Child Health Management:** Monitor children's health within the same account.

- **Data Security:** Hosted in France with certified security standards.

- **Mobile Application:** Access platform features via smartphone app.

Appfine

- **Remote admission preparation:** Patients can submit necessary documents for admission without visiting the clinic.

- **Medical tracking through online questionnaires and connected devices:** Patients can transmit their medical information to the healthcare facility through online questionnaires and connected medical devices

- **Interoperability with the electronic health record:** it ensures seamless communication with the healthcare facility's electronic health record.

- **Connectivity for hospitalization dossier preparation:** The hospitalization dossier can be prepared directly within the Hospital Information System (HIS) through the app.

- Online portal for patients to manage healthcare procedures and access hospital services from home.
  - admission document submission,
  - room reservation,
  - bill payment,
  - review of past and upcoming stays.
- Improves efficiency of administrative staff and enhances appointment punctuality for medical teams.
- Benefits include time-saving for staff, improved billing accuracy, and a modern image for the facility.
- Offers comprehensive e-admission features, secure authentication, and mobile integration.

- emergency identification system provides immediate access to identity and health data for individuals in case of emergencies.

- QR codes to access vital information.

- real-time alerts in case of an accident.

- Data accessible only to authorized emergency personnel.

Medicalib is a platform facilitating home healthcare services for patients.

· request appointments with nurses, midwives, or physiotherapists through the website.

Benefits for Patients:

· contact healthcare professionals near the patient's location.

· Free of charge.

Data Security:

· Data is only used for operational purposes and is shared only with the accepting healthcare professional.

Appointment Process:

1. Patients submit their request online in under 3 minutes.

2. Medicalib finds an available healthcare professional for home care.

3. Real-time tracking of the request's progress is provided through an email link.

- Allows healthcare professionals to view and update patient records remotely.

- It provides 24/7 real-time access to patient records on laptops and tablets operating on the Windows OS.

- Can be used with or without an internet connection, ensuring accessibility even in areas with limited connectivity.

Tasks

- **Shared Tasks**: Allows sharing of tasks and management of workflows across multi-specialty teams and shared care settings.

- **Integration with Patient Records**: provides links back to the patient record, conversations, attachments, and full traceability of assigned tasks with one to-do list for each user.

- **Full Visibility for GPs**: full visibility of conversations related to their patient's care pathway.

- Efficient Information Exchange: Enables GPs to exchange referrals, test results, specialist communications, etc.

- SmartForms simplify eReferral and eAssessment submissions, reducing administrative burden.

REVIEWING INTERFACE

Different criteria to evaluate the GP