0. Team Formation

- Team members and their roles:

Patrick Michel

- Specialization: Cyber security, machine learning, full stack
- Responsibilities: Development of interfaces and backend management, AI integration, Data security and GDPR compliance
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Benjamin Ristord

- Specialization: Cyber security, machine learning, full stack
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Initial organizational proposal:

- Assignment of the role of temporary Project Manager:
- Suggestion: Patrick Michel as temporary PM
- Justification: Project initiator: first contacts with the client
- Establishing communication standards:

Communication tools offered:

- Principal : slack
    - Daily voice meetings
- Project management:
    - GitHub for task tracking
    - Canva for Agile Project Management
- Collaboration standards:
    - Daily standup meetings (15 min) every day
    - Sprint planning every 2 weeks
    - Mandatory code review before each merge
    - Systematic code documentation
- Decision-making process:
    - Major technical decisions: consensus required from both members
    - Minor decisions: autonomy in each area of specialization

1. Research and Brainstorming

Analysis of the current context:

- Problem: Cardiology practice of Dr. TZVETKOV
- Identified needs: AI integration to facilitate administrative management, data security
- Available technologies : IA (IBM Watsonx), Django, PostgreSQL

MIND MAPPING

```
CardioBot
├── User Interface
│ ├── Patient Portal
│   │   ├── ChatBot Audio
│ │ ├── Make an appointment
│ │ ├── Medical follow-up
│ │ └── Secure messaging
│ └── Practitioner Interface
│ ├── Dashboard
│ ├── Appointment management
│ └── Patient records
├── Artificial Intelligence
│   ├── IBM Watsonx
├── Security
│   ├── FranceConnect+
│   ├── Double Auth
│ └── GDPR
└── Infrastructure
    ├── Backend Django
    ├── Base PostgreSQL
    └── Monitoring Celery
```

FRAMEWORK SCAMPER

Substitute

- Replace phone calls with AI interactions
- Replace manual input with voice recognition
- Eventually replace Doctolib with an independent system

Combine

- Merge FranceConnect+ authentication with double authentication

Adapt

- Adapt the interface according to the user profile (patient/doctor)
- Personalize recommendations based on patient history

Modify

- Optimize wait times in real time
- Improving User Experience with Contextual Chatbots

Put to another use

- Transforming interactions into learning data for AI

Eliminate

- Remove redundant steps in making appointments
- Reduce the time allocated to administrative tasks

Reverse

- Reverse the flow: AI proactively suggests appointments
- Predictive rather than reactive system

QUESTIONS "HOW MIGHT WE"

Patient Experience :

- How could we simplify making appointments for patients?
- How could we facilitate patient care?
- How could we facilitate the provision of patient documents?
- How could we provide more personalized follow-up?

Administrative Efficiency :

- How could we automate document management?
- How could we optimize and automate appointment scheduling?
- How could we reduce waiting time?

Security :

- How could we strengthen data protection while maintaining accessibility?
- How could we simplify authentication while making it more secure?
- How could we ensure GDPR compliance transparently?

AI Innovation :

- How could we use AI to prevent heart risks?
- How could we improve the accuracy of Watsonx AI responses?
- How could we personalize interactions according to the patient profile?

2. Idea Evaluation

EVALUATION CRITERIA (Out of 5 points each)

A. Technical Feasibility (TF)

- 5: Technologies mastered and tested
- 3: Requires moderate learning
- 1: Complex/new technology

B. Impact Potentiel (IP)

- 5: Major benefit for users/customers
- 3: Significant improvement
- 1: Impact minimal

C. Technical Alignment (TA)

- 5: Perfectly aligned with technical stack
- 3: Requires some adaptations
- 1: Requires major changes

D. Scalability (SC)

- 5: Highly scalable
- 3: Medium scalability
- 1: Difficult to scale

E. GDPR Compliance (RG)

- 5: Fully compliant
- 3: Requires minor adaptations
- 1: Major Compliance Issues

FEATURE EVALUATION MATRIX

Feature	FT	IP	AT	SC	RG	Total	Priority
FC+ Authentication	4	5	4	5	5	23	High
2. Chatbot Watsonx Admin	3	4	4	4	4	19	Haute
3. PostgreSQL Database	3	3	3	4	3	16	Average
4. Notifications Twilio	5	4	5	5	4	23	Haute
5. Double Auth	5	4	5	5	5	24	Haute
6. Monitoring Celery	3	3	3	3	3	15	Average1

RISK AND CONSTRAINTS ANALYSIS

1. FranceConnect+ Authentication (High Priority)

Risks :

- Deadlines for obtaining accreditations
- Changes in the FranceConnect API Constraints:
- Requires certification
- Limited response time

Constraints :

- RGS* and GDPR approval required
- Separate recipe and production environments
- FranceConnect compliance tests imposed
- High level eIDAS integration
- FC+ specific user support

2. Chatbot WatsonX (High Priority)

Risks :

- Training complexity
- Ongoing maintenance required

Constraints :

- Significant server resources
- Team learning time

3. PostgreSQL Database (Medium Priority)

Risks :

- Complexity of configuration and optimization
- Increase in load to anticipate

Constraints :

- Significant hardware resources (4GB+ RAM, multi-core CPU, SSD)
- Complex configuration (tuning, backups, replication)

- Network security and access
- SQL and database admin expertise required
- Regular maintenance and monitoring

4. Twilio (High Priority)

Risks :

- Variable costs depending on use
- Dependence on an external service

Constraints :

- Communication budget to plan
- Management of SMS/call quotas
- Configuration des webhooks
- API integration time

5. Double Auth (High Priority)

Risks :

- Complexity of token management
- Risk of user blocking
- Securing secret keys

Constraints :

- Secure infrastructure required
- Management of loss of access cases
- Reinforced user support

- TOTP implementation time

5. Monitoring Celery (Medium Priority)

Risks :

- Surcharge des workers possible
- Loss of untracked tasks
- Complexity of debugging

Constraints :

- Dedicated server resources
- Configuration Redis/RabbitMQ
- Setting up alerts
- DevOps team training

3. Decision and Refinement

- MVP SELECTION

After analyzing the evaluations and team discussions, the MVP will focus on:

“Virtual Administrative and Medical Management Assistant for Cardiology Practice”

- PROBLEM DEFINITION

Current issues identified:

- Administrative overload of the office (70% of the time)
- Long waiting times for patients
- Difficulty managing emergencies
- Risks of errors in patient monitoring
- Complexity of GDPR compliance
- TARGET AUDIENCE

Primary Users:

A. Medical Staff

- Dr. TZVETKOV (cardiologist)
- Medical secretarial
- Nurses

B. Patients

- Regular patients (cardiac monitoring)
- New patients
- Urgent cases
- Families/Accompanying people
- KEY FEATURES OF MVP

A. Patient Portal (High Priority)

```
Functionality          | Description                    | Expected Result

-----------------------|--------------------------------|-----------------

Authentication         | FranceConnect+ & 2BUT          | Enhanced security

Making an appointment  | Int Doctolib egregation        | -30% calls

Medical Follow-up      | Patient Dashboard              | +50% engagement

Secure Messaging       | Communications RGPD            | Smooth
communication
```

B. Practitioner Interface (High Priority)

```
Feature | Description | Expected Result

------------------------|--------------------------------|-----------------

Dashboard | Overall activity view | +40% efficiency

Appointment management | Smart planning | -25% admin time

Patient Records | Data centralization | -50% paperwork

Emergencies | Prioritization system | Answer <15min
```

C. AI Assistant (Medium Priority)

```
Feature | Description | Expected Result
-----------------------|--------------------------------|-----------------
Automatic Sorting | Classification of requests | -40% sorting time
Auto Answers | Smart FAQ | -60% questions
Document Analysis | OCR + Classification | -30% entry
```

- ARCHITECTURE TECHNIQUE MVP

Frontend:

```
├── React.js
│   ├── Interface Patient
│   └── Practitioner Interface
├── Material-UI
└── PWA (Progressive Web App)
```

Backend:

```
├── Django REST
│   ├── API Gateway
│   └── Microservices
```

```
├── PostgreSQL
└── Redis (Cache)
```

IA/ML:

```
├── Watsonx AI (Chatbot)
├── Watsonx AI (Medical)
└── CamemBERT (NLP)
```

Security:

```
├── FranceConnect+
├── 2FA
└── E2E encryption
```

- EXPECTED RESULTS

A. Quantitative Metrics

```
Indicator | Objective
--------------------------|----------
Administrative time | -40%
Average appointment time | -30%
Satisfaction patient       | +50%
```

```
Administrative errors | -80%

Emergency response time | -50%
```

B. Qualitative Metrics

- Improved medical staff satisfaction
- Reduction of administrative stress
- Better patient-practitioner communication
- Strengthened GDPR compliance
- MVP DEVELOPMENT PLAN

Phase 1: Foundations (2 months)

```
Week | Objective

--------|----------

1-2     | Architecture base

3-4     | System auth

5-6     | DB & API core

7-8     | Unit testing
```

Phase 2: Core Features (2 months)

```
Week | Objective
```

```
--------|----------
9-10    | Interface patient
11-12   | Interface practitioner
13-16   | Messaging
```

Phase 3: AI & Optimization (2 months)

```
Week | Objective
--------|----------
17-18   | Chatbot base
19-20   | Medical AI
21-22   | Tests & Debug
23-24   | Deployment
```

- CONSTRAINTS AND LIMITS MVP

Techniques :

- Real-time performance
- Medical data security
- System availability

Regulatory:

- strict GDPR
- HDS (Health Data Hosting)
- Medical standards

Users:

- Training required
- Resistance to change
- Accessibility
- NEXT STEPS

Immediate:

- Final customer validation
- Dev environment setup
- Detailed sprint planning

Short-terme :

- Auth system development
- Creation of basic interfaces
- Preliminary tests

This detailed definition of MVP makes it possible to:

- Clarify objectives
- Set priorities
- Establish a realistic schedule
- Measuring success

4. Idea Development Documentation

A. Ideas Considered

Idea 1: Standard Web Application

- Forces :
    - Rapid development
    - Controlled costs
    - Accessibility from browser
- Weaknesses:
    - Limited performance
    - Limited offline features
    - Less smooth user experience
- Reason for rejection: Unsuitable for real-time performance constraints

Idea 2: Native Mobile Application

- Forces :
    - Performance optimale
    - Full access to device features
    - Better user experience
- Weaknesses:
    - More expensive development
    - Maintenance on multiple platforms
    - Complex distribution
- Reason for rejection: Incompatible budget and deadlines
-

Idea 3: Progressive Web App (Retainer)

- Forces :
    - Optimal web/native compromise
    - Simplified deployment
    - Support offline
    - Controlled costs
- Weaknesses:
    - Limitations iOS
    - Average performance
    - Increased technical complexity

B. MVP Selected

Description

PWA solution with microservices architecture, integrating:

- FranceConnect+ authentication
- Secure medical data management
- Interface responsive
- Basic offline mode

Justification

- Best cost/performance compromise
- Rapid deployment possible
- Guaranteed scalability
- Regulatory compliance made easy

Potential Impact

- Business: ROI estimated at 6-8 months
- Users: Easier gradual adoption
- Technique: Solid basis for developments

Constraints and Limits

Techniques :

- Real-time performance
- Medical data security
- 24/7 system availability

Regulatory:

- strict GDPR
- HDS (Health Data Hosting)
- Medical standards

Users:

- Training required
- Resistance to change
- Accessibility

C. Team Training

Incorporation Process

Roles identified:

- 2 Full-Stack developers
- 1 security/GDPR expert
- 2 UX/UI designers
- 1 Product Owner
- 1 Project Manager

Selection criteria:

- PWA Mastery
- GDPR/HDS knowledge

Organisation

Structure :

- Self-organized agile team
- 2 week sprints
- Daily meetings

Methodology:

- Adapted Scrum
- Systematic code review

- CI/CD - Integration Continuous / Deployment Continuous
- DDD - Domain Driven Design

Communication :

- Slack for daily communication
- Canva for project monitoring
- Weekly reviews with Google Meet

Next Steps

Immediate:

- Final customer validation
- Dev environment setup
- Detailed sprint planning

Short Term :

- Watsonx AI Studio Integration
- Auth system development
- Creation of basic interfaces
- Preliminary tests