# D5.2    Market research & Technology watch (a)

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[1] L = Legal agreement, O = Other, P = Plan, PR = Prototype, R = Report, U = User scenario

[2] PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

# Partner list

| Nr. | Partner name | Short name | Org. type | Country |
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# Glossary

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|---|---|
| **AAL** | Active Assisted Living Joint Programme |
| **ePRO** | Electronic Patient-Reported-Outcome |
| **ePROM** | Electronic Patient-Reported-Outcome Measure |
| **EU** | European Union |
| **ICT** | Information and Communications Technologies |
| **PEST** | Political, Economic, Social and Technological Factors |
| **PT** | Portugal |
| **PM** | Person Month |
| **PEST** | Political, Economic, Social and Technological |
| **RA** | Rheumatoid Arthritis |
| **SWOT** | Strengths, Weakness, Opportunities and Threats |

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# 1. Introduction

The Market Research & Technology Watch is a document that will deliver the information needed to make decisions about product and business positioning during and after the project scope of COTIDIANA. It is safe to state that this document is one of the most important deliverables in the project, and therefore is natural that it will have multiple versions  of it throughout the project, making it stronger with time and making room for coping with new inputs and information.

In essence, this report defines the first approach to the market, listing the market players, stakeholders, and target groups of the COTIDIANA solution. As to provide the right context to make the first decisions about the product and business development, the document aims to deal with following key questions:

- What are the main competitors of COTIDIANA?
- What specific companies are servicing the same market as COTIDIANA?
- What are the stakeholders COTIDIANA should take into consideration?
- What are the focus customers of COTIDIANA?
- What do customers expect from this type of product or service?
- What core competencies should the product or service have?
- What are (country-specific) regulatory requirements?

As the name suggests, the Technology Watch & Market Research report is divided in two different sections:

**Market Research:** Focuses on mapping the overall potential market for the COTIDIANA solution, stating (1) the problem scope and the opportunity for the project, (2) macro-economic aspects, (3) strengths, weaknesses, opportunities, and threats analysis, (4) mapping the stakeholders, and a (5) competitors' analysis.

**Technology Watch:** This section presents existing solutions that are operating within our potential market. Those solutions have to be kept under consideration, while implementing the COTIDIANA solution.

Throughout the document, as for most business and technology analysis, quantitative and qualitative methodologies were used.

Finally, the report includes an analysis about the key insights of the research for the future business plan; these insights will be a preliminary analysis of the market & product strategy. The consortium believes that this document is a starting point to clarify the present and future strategy.

# 2. Market Research

This section provides insights and key figures to accurately determine questions concerning the market-dimension of the COTIDIANA Project. The market research is a standardized task; however, documents of this sort often miss out on key figures and causalities that may lead to a severe misjudging of the proper market size. The timing of the execution of this section allows for both analysing prospects and making additional changes if necessary.

Since the project is still in early stages, the scope of the analysis is, as it should be, very broad. We aim in this section to cover all the areas which directly influence the final guidelines of the market sizing and business planning activities. We consider these areas to be essential in our research as they provide the answer for the three questions the building of the prototype should answer:

- *Where should we market it? (Target market)*

- *Who will use it? (Target customers)*

- *What is the best solution (Target solution & endpoints)?*

## 2.1. Problem scope and Opportunity

Rheumatic conditions are extremely common in older age. Estimations refer that 56% of adults suffer from a rheumatic condition and these figures increase with age. The high prevalence of rheumatic conditions in the (growing) age-group of older adults is likely to further distance the already irregular follow-up appointments, and thus impact patient care. Moreover, a six-month distance between appointments is already likely to miss flares in between visits and thus have low sensitivity, low sampling frequency, high variability, and an inadequate representation of patient experiences.

Electronic Patient Reported Outcomes Measures (ePROMS) have been developed to support clinicians with richer outcomes from the perspective of patients. However, existing ePROMS are not cost-effective, since they are:

- restricted to self-reported data, leaving behind digital endpoints that can be extracted using sensing or logging,
- difficult to use by patients, which affects mostly older adults with less experience using ICT,
- targets specific care focuses (i.e., clinical care or drug trials) and disregard the ecosystem nature of care; and
- are not specifically focused on rheumatic diseases.

COTIDIANA will develop a mobile solution to efficiently acquire PROMS as well as smartphone sensor data to support clinical care and drug trials of older adults with

rheumatic diseases, collecting data about the state of the patient, their treatment, or the added value of the drug under test in a trial. COTIDIANA will support rheumatic conditions in general. During the project we plan to involve older people with different conditions, drawing on the important commonalities between conditions, but it is probable that in a specific trial, the focus will be on one specific rheumatic condition, for example osteoarthritis, to simplify the clinical research study design.

Patients will use the smartphone in ambulatory conditions to report their experiences, symptoms/signs, and quality of life. Drawing on the smartphone's built-in sensors and logs, we will be able to objectively track digital endpoints focused on hand dexterity (as an indicator for function or disease activity), gait and physical activity (as an indicator for mobility, fatigue, and pain), and sociability patterns (as an indicator of mental health and wellbeing).

Analysing the macro-environment in which COTIDIANA will be embedded on and studying advantages and disadvantages of its approach may provide us with insights on how to better adapt the solution and its positioning in the market. PEST and SWOT analysis, as well as a mapping of stakeholders have been performed in order to increase knowledge and understand the market.

## 2.2. Regarding the macro-environmental aspects

Europe is getting old as the overall trend of demographic change is that of an ageing continent. The following map shows the regional distribution of the shares of elderly across Europe:
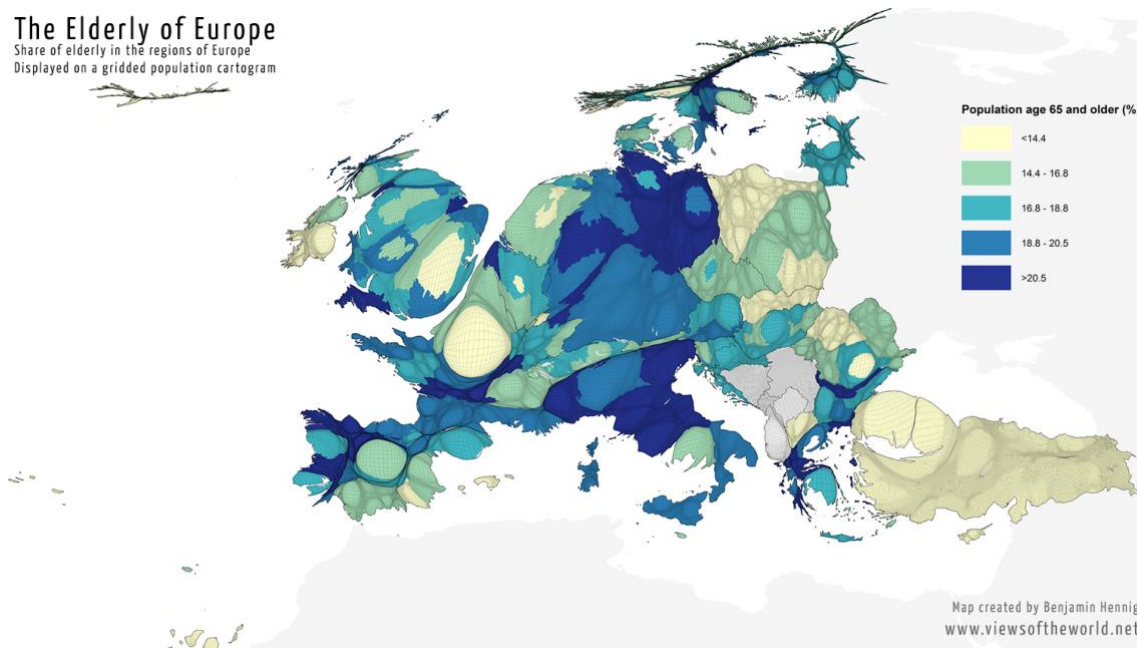


**Figure 1** Gridded population cartogram distribution of elderly across Europe

What does this cartogram mean: While Europe is getting older, there are increasingly smaller numbers of children. Thus, it's most likely, that the number of people no longer working is quickly increasing (often in need of long-term health and social care) – on the other side, the younger generation has to sustain the slowly ageing societies. Furthermore, there will be an increased need of (formal and informal) caregivers – a need where it will be difficult to close this gap without any technological supporting mechanisms.

Next to this aspects, one can say, that the internet and mobile devices, health and mobility technology for elderly people have improved dramatically over the past decade. Lifeline alarms are a great example – from the standard pendant alarm to landline-free digital alarms and even GPS-enabled fall detectors [13].

However, since the COVID-19 pandemic began, we've all become a lot more reliant on technology to communicate and keep up the individual social life. Older people are embracing modern technology more than ever before. In fact, according to the latest research, 77% of over-65s used the internet at home in 2020 [13]. According to the same findings, recent internet use among women aged 75 and over had more than doubled since 2011 [13].

Recent internet use in the 65-74 age group has increased from 52% in 2011 to 83% in 2019, which means older people are closing the generation gap in technology usage. Older people aren't just using their computers either, they're branching out into mobile phones and tablets too [13]. More than a quarter (28%) of people over the age of 75 now use tablets – an increase of 15% from 2015 [14].

The market of ICT for supporting clinical care and drug trials, also known as eClinical market, has been consistently growing. The most recent market research report 2 points to a worldwide market value of $5.06 billion in 2018 projected to grow to 10.5 billion by 2024. eClinical encompasses a variety of different tools including technologies for electronic data capture, clinical trial management and randomization, and electronic patient reported outcomes and patient diaries. The specific market of COTIDIANA, the ePROMS market was estimated at $500 million per year in 2017 [2] and was considered the fastest growing market in eClinical due to the increasing demand to "to collect patient self-reports by major pharmaceutical companies".

The matter of the geographies in which we intend to market the product is addressed in in the way, that we will study Europe as our target region in which we will develop our activity and profile the market. So COTIDIANA's aim is to improve the lives of older adults or seniors suffering from rheumatic conditions in Europe.

All initial efforts will be made to ensure dissemination and commercialization of the prospective COTIDIANA solution within countries of the European Union, as these

countries share large part of legislation, care organization practices and guidelines, as well as technological standards.

As statistics show (see Figure 1), Europe will soon experience a severe increase in the ratio of older people in its population. Furthermore, our research results show that older people are becoming more tech-savvy over time. Thus, along with the eClinical-market's rapid growth, and the fact that rheumatic conditions are extremely common in older age have fostered the collaboration between rheumatology and technology companies giving the motto for projects like COTIDIANA. Thus, it is of the utmost importance for policy makers and researchers to find a way to provide autonomy to this growing section of the population, a need which COTIDIANA will help.

The Exploitation, Business Planning and Dissemination Deliverable (D5.3, D5.4 and D5.5) will detail the selected business approach and the target customer for the prospective COTIDIANA solution.

### 2.2.1. SWOT Analysis

Performing a SWOT analysis allows us to measure the relative Strengths, Weaknesses, Opportunities and Threats of the prospective COTIDIANA App.



**Figure 2** SWOT Analysis Framework

**Strengths:**
- Diverse and wide-reaching capabilities of the CODITIANA consortium partners
- Specialized insights about rheumatic diseases
- Specialized insights about cutting edge technological development
- Specialized insights about user-centred design
- Market insights since partners commercialises solutions in this space
- Service provider insights

**Weaknesses:**
- Organizational bias
- Budgetary constraints
- Resourcing constraints because of multiple project objectives
- Timekeeping/Tight Deadlines

**Opportunities:**
- Wide network of prospective stakeholders and end users
- Real possibility to make an impact in the lives & improve life quality of users
- Co-designed and tested solution can distinguish from competition
- Wide geographical reach
- Growing target market/demographic

**Threats:**
- Existing technology with some comparable features, functionality, and objectives
- Market with multiple established competitors
- Create a solid customer base is hard
- Technical barriers for target demographic
- Potential costs (for end-users like clinics, pharma, etc.) of final solution might hinder adoption
- Lack of user engagement due to unappealing UI and functions of the app
- Legal constraints
- System may be labelled as a "medical device" and require additional certification or validation

Conducting this SWOT analysis has highlighted the relative strengths and weaknesses of COTIDIANA from an internal perspective. It has also enabled us to anticipate and exploit the opportunities and mitigate the threats related associated to external factors. The findings from this SWOT analysis will help to shape the development of a solution whereby COTIDIANA can capitalize on the Strengths and Opportunities and minimize and mitigate against the Weaknesses and Threats identified wherever possible.

### 2.2.2. Stakeholder Mapping

The stakeholder analysis is a series of activities designed to identify core groups of the most relevant stakeholders for an organization at a given time. The stakeholder mapping aims to detect in a structured and effective way, with internationally agreed methodologies, which stakeholders an organization should consider as a priority in its activities.

Stakeholders can be internal and external to an organization. As the terms suggest, internal stakeholders come from within the organization while we can define external stakeholders as people who are impacted by the organization's work. The purpose of stakeholder analysis is to identify who might contribute to the project, where barriers might be and the actions that need to be taken.

Within the COTIDIANA project, the internal stakeholders are:

- **Consortium:** represented by the partners that constantly collaborate to make the COTIDIANA App a reality.
- **Collaborators:** the people that we'll engage in the development of the app

The external stakeholders include people that are currently involved in the COTIDIANA project and those that we plan to engage in the near future:

- **Patients:** primary end-user of the project that will benefit from the solution that we'll develop

- **Clinicians**: doctors, nurses, and other healthcare professionals that deal with patients with rheumatic conditions and aim to have more information about the patients' status in everyday life, increase medication adherence, and get an overview of the patient's status when they enter the clinicians' office. These are the secondary end-users.
- **Hospital & Health systems:** care ecosystem, hospital rheumatology departments, clinics, or Clinical Research Organizations (CRO). They are responsible for the care of people with rheumatic conditions and look forward to solutions to improve the health of their population.
- **National Health Systems:** Aiming to assure appropriate health services to part or all of the population.
- **Institutions**: Continued evidence building through increased clinical trials with COTIDIANA app
- **Payer**: Establish reimbursement mechanisms to support the use of approved COTIDIANA App by patients and clinicians. Payers could be clinics, hospitals, pharmaceutical companies, etc.
- **Policy makers:** the European community, in particular the Ambient Assisted Living programme
- **Regulators:** Continued clarification of regulatory aspects for COTIDIANA app.
- **Media:** television broadcasters, press and internet that we'll engage for dissemination purposes
- **Investors:** venture capitalists, entrepreneurs, banks that can contribute to help the project grow after the current phase which is sponsored by the AAL programme
- **Pharmaceutical Companies:** with drugs for rheumatic conditions
- **Non-Profit (health) Organizations:** health-focused groups that advocate for and are held accountable to the community leaders who serve as trustees and represent the local neighbourhoods they strive to serve. Rather than making a profit for private owners, these non-profit groups use earnings to reinvest in the health and well-being of the general public.
- **(Academic) research centres:** centers that perform medical research on rheumatic conditions, either funded by public funds or sponsored by Pharma
- **Product Partners:** with whom to cooperate (around the world) - based on their expertise in specific fields, these experts are a useful addition to COTIDIANA's exploitation plans
- **Helpdesk:** providing technical assistance and support related to COTIDIANA; responsible for answering queries and addressing solution and user issues in a timely and professional manner.
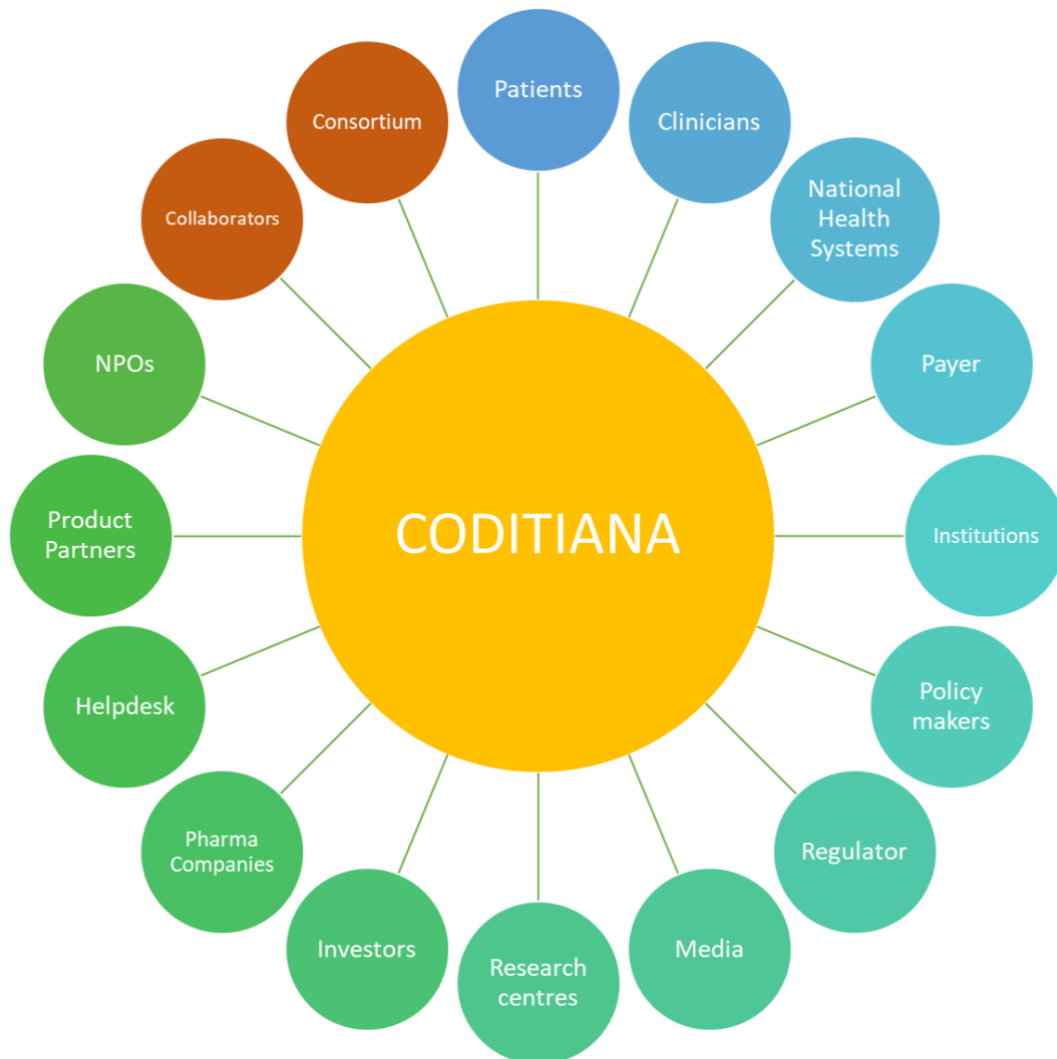
**Figure 3** Internal vs. external stakeholders

One of the best known and most commonly used methods for stakeholder mapping is the stakeholder analysis matrix, proposed by (Mitchell et al, 1997). The classification of stakeholders is based on the power to influence, the legitimacy of each stakeholder's relationship with the organization, and the urgency of the stakeholder's claim on the organization. The results of this classification may assess the fundamental question of "which groups are stakeholders deserving or requiring manager's attention, and which are not?".

An evaluation of the importance of the stakeholders from the COTIDIANA project's perspective has been carried out. To this purpose, the influence and interest of each stakeholder in the project has been evaluated as "low" or "high". The results have been reported in Figure 4.
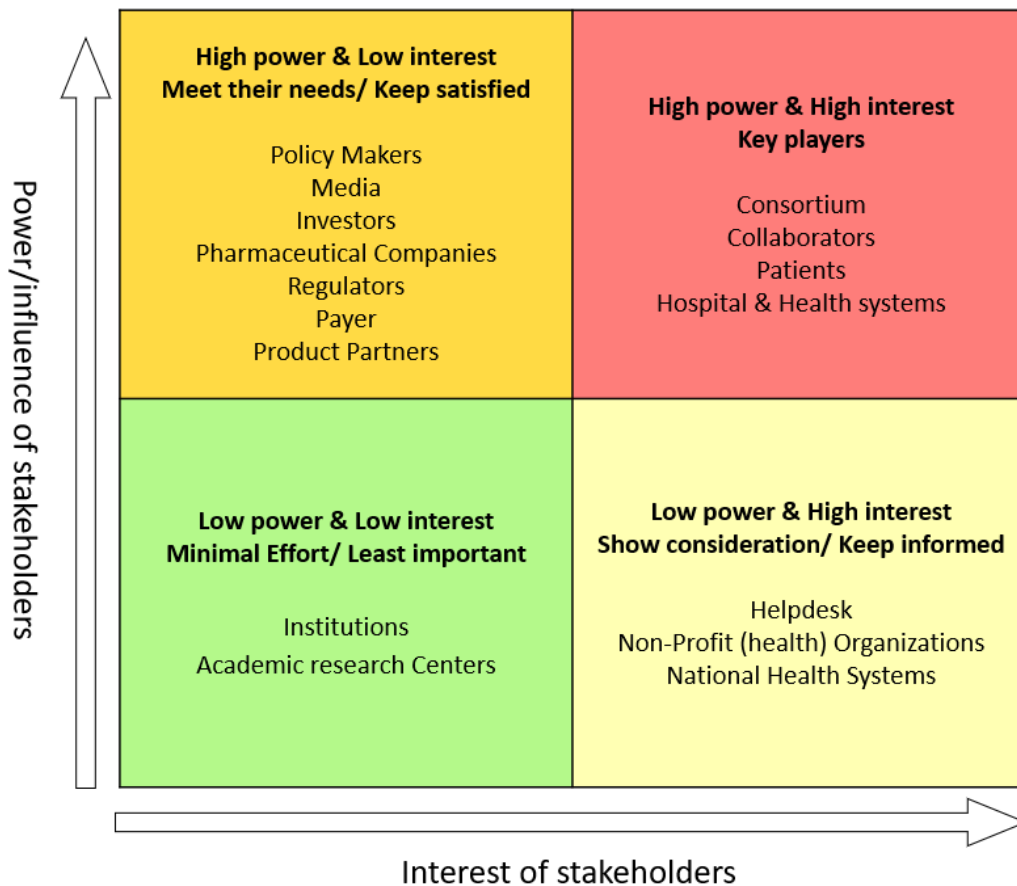
**Figure 4** Stakeholder analysis matrix (positioning)

In the positioning of the stakeholders across the different areas of the graph above, we took into account the current phase of the project. Although it is relatively easy to determine whether a stakeholder has a low or strong power, defining the interest that stakeholders have in the project is much more difficult as we're currently in the development process of the solution.

The interpretation of the results must consider the following points:

- **High influence, highly interested people:** these are the people COTIDIANA must fully engage and make the greatest efforts with
- **High influence, less interested people:** provide sufficient information to these people to ensure that they are up to date but not overwhelmed with data
- **Low influence, highly interested people:** keep these people adequately informed, talk to them to ensure that no major issues arise. These people can also help with the detail of COTIDIANA
- **Low influence, less interested people:** provide these people with minimal communication to prevent boredom.

### 2.2.3. Positioning – Kawasaki Statement

The Kawasaki Positioning Statement is a tool developed by Guy Kawasaki (a Silicon-Valley based author, speaker, entrepreneur, and evangelist that worked for Apple in the early days of the Macintosh marketing) that allows for a one-paragraph presentation of a product positioning that touches all the necessary topics for a clear view of the solution statement.

## *COTIDIANA is a solution*

- For **patients** (especially older people) with rheumatic conditions **(target customer)**
- who have the need to monitor their symptoms and engage in self-care **(statement of the need or opportunity)**
- the COTIDIANA App **(product name)**
- is a mobile app/service **(product category)**
- (1) supports self-care with medication reminders and tips, (2) enables symptom monitoring through PROMS and passive sensing, all of which while (3) providing high usability, even for older adults with little experience with technology, and, thus, increases quality of life **(statement of benefit)**
- Inclusion of passive sensing requires less self-report effort from patients **(primary competitive alternative)**
- COTIDIANA solution will be more cost-effective, as it will be usable by older adults, more complete due to the inclusion of digital endpoints, designed for the care ecosystem, and the only focused on older adults with rheumatic diseases. **(statement of primary differentiation).**

## *COTIDIANA is a solution*

- For **clinicians** (e.g. clinical researchers from pharma, CRO's or academic research centres)
**(target customer)**
- who wants to have more info about the patients' status in everyday life, a more holistic perspective on the conditions of patients and/or the impact and adherence of drugs and medication, and, thus, respond better to the clinical picture of the patient
**(statement of the need or opportunity)**
- the COTIDIANA App
**(product name)**
- is a web app/service
**(product category)**
- that enables holistic and efficient patient monitoring for clinical care and drug trials due to the rich data collection
**(statement of benefit)**
- inclusion of passive sensing provides additional data to care/research
**(primary competitive alternative)**
- COTIDIANA mobile solution enables holistic and efficient patient monitoring for clinical care and drug trials due to the rich data collection in ambulatory that includes subjective data (patients' experiences and quality of life) and objective digital endpoints (drawing on smartphone sensing and logging).
**(statement of primary differentiation).**

### 2.2.4. Target customers

Based on the results of the stakeholder analysis and the Kawasaki we will have a closer look at the core customers of COTIDIANA. The foundations of this research are related to the target users for COTIDIANA divided by focus intensity, meaning if the COTIDIANA App ends up being used by old people directly as a monitoring tool, we want to accurately identify our potential users. Having reflected on COTIDIANA's stakeholders, we are now able to more easily identify potential target customers for the prospective COTIDIANA solution, an essential step to take before deciding the best approach for promoting and marketing it.

The focus on rheumatic conditions was due to the prevalence of these conditions among older adults as well as the large diversity of symptoms and signs that these conditions bring to patients. Having proven our potential for older patients with rheumatic conditions, we probably will expand to other conditions. The idea is to adopt an inclusive design approach during the project, where, by focusing on solving problems for a more extreme user group, we will be able to extend the use of the product to a wider range of the population, regardless of age, culture, or abilities.

The customers of COTIDIANA are mainly Hospitals and Clinics, as well as pharmaceutical companies. Our clients will hire the COTIDIANA solution as a service – paying a fee for each participant. Even if patients do not contribute directly to monetary value creation, they should also be considered as essential stakeholders.

Table 1 details the initially identified potential customers.

**Table 1** Table of potential customers.

| Potential customers | Value proposition offered by COTIDIANA | Motivation to select as COTIDIANA customer |
|---|---|---|
| Pharmaceutical Industry | For the support of its clinical studies, the pharmaceutical industry uses only validated systems that correspond to the state of the art in science and technology and meet all regulatory requirements.<br><br>Patient questionnaires are used to accompany many study patients through a project. These questionnaires are filled out by hand by the patients and are transferred to the study database by study staff.<br>This leads to time delays and transmission errors during data entry.<br><br>The Digitalisation of this process would be a big benefit. | High quality approach of COTIDIANA<br><br>The product is developed by:<br>• International experts<br>• In compliance with all standards, specifications, and guidelines<br>• Considering the processing of personal data collection for scientific research purposes<br>• Traceability of the development process<br>• External validation of the product by a medical device expert.<br>• Quality Management System in place |
| Clinicians | Enables holistic and efficient patient monitoring for clinical care and drug trials due to the rich data collection | Managing patients' health and improving patient outcomes is seen as key distinguishing factor for healthcare institutions, which are more and more evaluated based on the outcomes of their patient populations. The focus on wellbeing is also growing to be a business priority for clinicians with a more social approach |
| Patients (focus on older people) | Optimized for rheumatic conditions, enables high usability, even for older adults with little experience with technology, and, thus, increases quality of life | People who need the app and will reap the largest reward, due to improved treatments, better drugs in the future, or through the use of self-care features. |
| Product Partners | Enlarging product portfolio | Commercial network already set up |

| | | World-wide presence, which may allow for larger reach of the product |
|---|---|---|
| National Health Systems | Improvement and maintenance of the health of the population | Anticipate and adapt to existing and future health needs, thus contributing to better health outcomes |

Most key pharmaceutical companies developing drugs medication for rheumatic conditions [3] (AbbVie, lnc., Janssen Biotech, lnc., Amgen, lnc., Pfizer, lnc., Novartis AG, Sanofi S.A., F. Hoffmann-La Roche Ltd., Merck & Co., lnc., Bristol-Myers Squibb Company, and Eli Lilly and Company) are sensitive to the developments on digital endpoints. The support to this program and other projects around digital endpoints (e.g., Clinical Trials Transformation Initiative [4]) show the interest of Pharma to invest on research that enable the use of digital endpoints in drug trials. Moreover, and as products in the market do not include digital endpoints just yet, COTIDIANA has the chance to open the market with a set of digital endpoints validated for rheumatic conditions.

# 3. Technology watch

Technology Watch can be seen as the systematic procedure of capturing, analysing, and exploiting useful information for strategic decision making in an organisation [11].

The work on this section follows the state of the art on products, services and models that listed existing solutions related to the context of COTIDIANA available in the market. Thus, the technological watch will support COTIDIANA's goals by understanding the value of existing solutions, active companies, and new market opportunities.

Based on the initial analysis in the project proposal, a selection and deeper research of relevant solutions/providers was carried out in the course of this report.
Some of the solutions listed in the proposal were not considered in the in-depth analysis. These were mainly solutions for which a more detailed analysis was not possible due to a lack of web presence, and thus a lack of information for further comparison.

## 3.1. Existing Solutions

While COTIDIANA will be the first solution to completely monitor patients' rheumatic conditions in a holistic way and intervene on their health, some of its components resemble existing technologies. Here we present existing solutions that form the most relevant technologies available previously.

As a first step the different solutions are included in a framework where we list the name of the solution, the link, its functionalities, its technologies, and an accurate description on the features for our core users (patients & clinicians).

**Table 2** Examples rheumatic apps currently available in the market.

| Name | Country | Link | Focus | Type of service | Features for Patients | Features for clinicians |
|------|---------|------|-------|-----------------|----------------------|------------------------|
| Andaman7 | US | https://www.andaman7.com/ | Open scope (suitable for any type of disease) | Mobile App | • self-reporting ePROs<br>• sign eConsent<br>• data visualization<br>• electronic medical record (EMR)<br>• collect and analyse health data | • GDPR & HIPAA compliance<br>• create ePROs<br>• patient onboarding (eConsent)<br>• remote patient monitoring |
| Ches.pro | AT | https://ches.pro/#applications | Open scope (suitable for any type of disease) | Web-based Solution & Mobile App | • self-reporting ePROs<br>• data visualization<br>• electronic medical record (EMR)<br>• collect and analyse health data<br>• telehealth | • create ePROs<br>• data visualization (dashboard)<br>• eTMF<br>• online consultations |
| Cliexa | US | https://www.cliexa.com/cliexamobile/rheumatoid-arthritis/ | Designed for rheumatic conditions | Web-based Solution & Mobile App | • self-reporting ePROs<br>• sign eConsent<br>• data visualization<br>• electronic medical record (EMR)<br>• pain reporting<br>• telehealth<br>• automated appointment scheduling | • create ePROs<br>• patient onboarding (eConsent)<br>• data visualization (dashboard)<br>• remote patient monitoring<br>• digital endpoints for rheumatic conditions<br>• online consultations<br>• adherence tracking |
| Datacubed | US | https://www.datacubed.com/solutions/ | Open scope (suitable for any type of disease) | Web-based Solution & Mobile App | • self-reporting ePROs<br>• data visualization<br>• collect and analyse health data<br>• medication reminders/adherence<br>• focus on patient engaging (via Gamification, Rewarding, etc.) | • create ePROs<br>• data visualization (dashboard) |
| Encapsia | UK | https://encapsia.com/ | Open scope (suitable for any type of disease) | Web-based Solution & Mobile App | • self-reporting ePROs<br>• sign eConsent | • create ePROs<br>• data visualization (dashboard)<br>• patient onboarding (eConsent)<br>• support for eConsent<br>• online/offline Functionality |
| Iddi | BE | https://www.iddi.com/ | Open scope (suitable for any type of disease) | Web-based Solution | - | • create ePROs<br>• data visualization (dashboard)<br>• CDISC data import/export |
| Know your DAS | UK | https://www.knowyourdas.com/ | Designed for rheumatic conditions | Mobile App | • self-reporting ePROs (Patient Diary)<br>• data visualization<br>• collect and analyse health data<br>• medication reminders<br>• data visualization | • GDPR compliance<br>• create ePROs<br>• digital endpoints for rheumatic conditions |

| | | | | | | |
|---|---|---|---|---|---|---|
| Medrio | US | https://medrio.com/ | Open scope (suitable for any type of disease) | Web-based Solution | • self-reporting ePROs<br>• sign eConsent<br>• data visualization<br>• data entry reminders | • create ePROs<br>• patient onboarding (eConsent)<br>• data visualization (dashboard)<br>• remote patient monitoring |
| OpenClinica | US | https://www.openclinica.com/ | Open scope (suitable for any type of disease) | Web-based Solution | • self-reporting ePROs<br>• data visualization<br>• data entry reminders<br>• focus on patient engaging (via images, videos, VAS scales) | • GDPR compliance<br>• create ePROs<br>• data visualization (dashboard) |
| RA Monitor | US | https://ra-monitor.com/ | Designed for rheumatic conditions | Mobile App | • self-reporting ePROs (Patient Diary)<br>• collect and analyse health data<br>• medication/treatment reminders<br>• data visualization<br>• telehealth<br>• medication/treatment tracking | • create ePROs<br>• remote patient monitoring<br>• data visualization<br>• digital endpoints for rheumatic conditions<br>• online consultations |
| RheumaBuddy | EU | https://www.rheumabuddy.com/ | Designed for rheumatic conditions | Mobile App | • collect and analyse health data<br>• medication reminders<br>• buddy-Function | - |
| TrailOnline | SE | https://www.trialonline.com/ | Open scope (suitable for any type of disease) | Web-based Solution | • self-reporting ePROs<br>• sign eConsent<br>• data visualization<br>• telehealth (virtual visits)<br>• visit reminders | • GDPR & HIPAA compliance<br>• create ePROs<br>• data visualization<br>• online consultations |
| PromptlyHealth | PT | https://www.promptlyhealth.com/ | Open scope (suitable for any type of disease) | Mobile App | • collect and analyse health data<br>• medication/treatment tracking<br>• data visualization<br>• community building<br>• educational content | • GDPR & HIPAA compliance<br>• create ePROs<br>• data visualization<br>• remote patient monitoring<br>• enable telehealth<br>• adherence tracking |
| Track+React | US | https://myhealthapps.net/app/details/558/track-react | Designed for rheumatic conditions | Mobile App | • data visualization<br>• medication reminders<br>• pain reporting | • remote patient monitoring<br>• enable telehealth<br>• digital endpoints for rheumatic conditions |

It should be mentioned that many of the features are not only relevant for one of the two analysed focus target groups. In order to avoid redundancy, the features were retained for those target group for which the feature seems more valuable.

## 3.2. Detailed Competitor Analysis

Based on the analysis in section 3.1, we'll run a detailed competitor analysis to identify the current and potential competitors that have similar business focus and/or operate in the same market as if our COTIDIANA App.
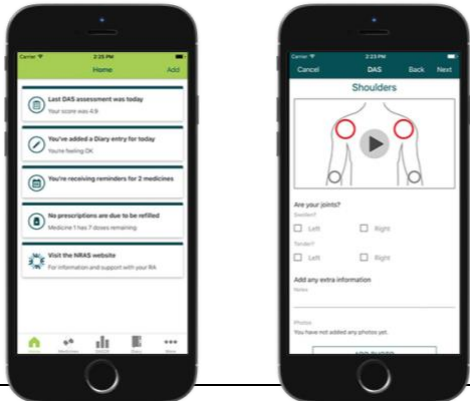
The analysis has two main goals:
1) Obtaining information about the most important competitors, and
2) Using that information to predict competitor behaviour

With regard to the goals of COTIDIANA, those solutions with following criteria are selected for a more detailed research:
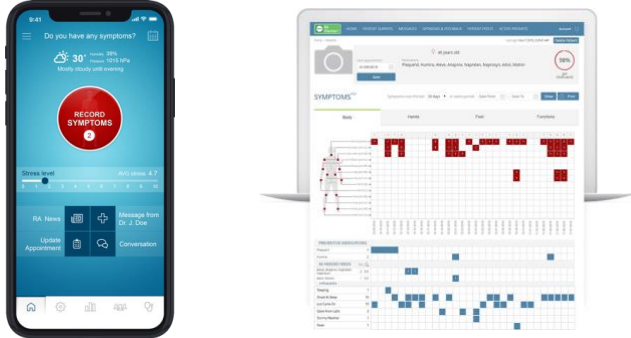
- focus on both patients and clients
- existing mobile solution
- provide digital endpoints for rheumatic conditions
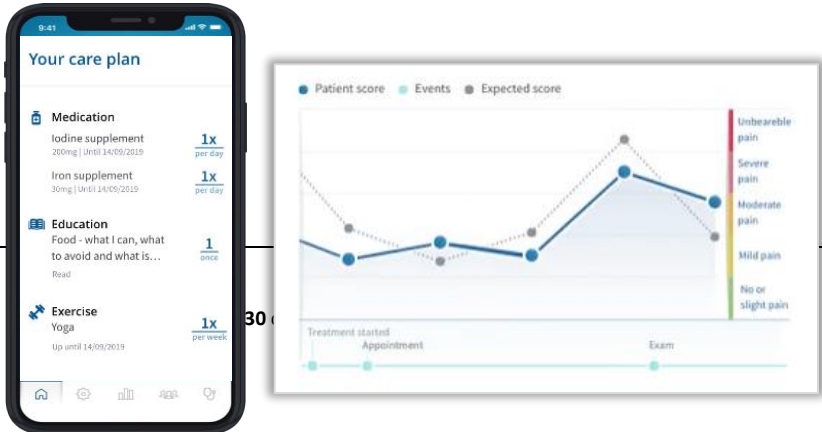- relevant/extraordinary features for users

Especially regarding the digital endpoints of rheumatic diseases, this analysis places particular focus on the data collected, as they are one of the most important aspects to consider when implementing the COTIDIANA app.

| Know your DAS | |
|---|---|
| **Country** | UK |
| **Enterprise** | National Rheumatoid Arthritis Society (NRAS) |
| **Type of service** | Mobile App |
| **Website** | https://www.knowyourdas.com/ |
| **Status** | Market launch in 2017 |
| **Description** | The 'Know your DAS' app is a free health app which is designed to monitor and track aspects of Rheumatoid Arthritis (RA) using the Disease Activity Score, or DAS28 (so called because it assesses 28 joints in the body). DAS28 is a measure of how well your RA is being controlled and how well you're responding to treatment. The assessment is quick and easy to complete and the 'Know your DAS' app carries out the mathematical calculation needed to produce the DAS28. <br><br> Thus, it can be recommended as a useful resource to help RA patients understand how well their treatment is working. <br><br> The information is stored on the patient's device only and the progress can be shared with the patient's healthcare professional (HCP) over time for a holistic picture of the patient. So, a mutual decision can be made, whether any changes in treatment are needed to help improve the management of the disease [7] <br><br> The app features include: <br> • DAS28 assessment calculator <br> • Health diary <br> • Video guide <br> • Summary of results reporting tool <br> • Email results to your HCP functionality <br> • Further information on DAS28 <br> • Medicine reminders <br> • Register and save your data to the cloud <br> • Sync data across multiple devices |
| **Market focus** | End-Users (Patients) via App Stores |
| **Data collected via questionnaires** | • Determine Disease Activity (DAS-28) <br> • Pain Reporting <br> • Reporting tender and swollen joints <br> • Mood reporting |
| **Data collected via sensors** | - |
| **Screenshots** |  |

| | |
|---|---|
| Country | US |
| Enterprise | Cliexa Inc. |
| Type of service | Web-based Solution & Mobile App |
| Website | https://www.cliexa.com/cliexamobile/rheumatoid-arthritis/ |
| Status | Market launch in 2016 |
| Description | Cliexa is a fully compliant integrated digital health platform that provides in-clinic digital screening, real-time Electronic Medical Record (EMR) integration, and patient remote monitoring, ensuring the entire patient journey is easily tracked and accessible to both patient and provider [6]. Patients track their health status remotely and connect wearable devices to gather quantifiable data. Patient data is reviewed by the clinician and integrated into the existing EMR system.<br><br>The platform increases clinical efficiency with customized intake workflows and up-front screening tools, while qualifying patients for reimbursements automatically. Cliexa is easily customizable, allowing providers to gather the relevant information to their clinical decisions, and has developed a suite of products across rheumatology, pain management, integrated pain, behavioural health, foot/podiatry, cardiology, emergency medicine, endocrinology, gastroenterology, and pulmonology.<br><br>Cliexa integrates critical patient data between appointments by connecting clinicians to their patients through the remote patient monitoring tools. The goal is to provide actionable data directly to the patient's chart with robust, automated compliance support. Cliexa empowers physicians by giving them opportunities to enhance their workflow, increase reimbursements and improve outcomes [5]. |
| Market focus | Hospital & Health Systems, Product Partners, Research Institutions, Non-Profits, Pharmaceutical Companies, Primary Care & Subspeciality Clinics |
| Data collected via questionnaires | • Disease activity scores (DAS-28, CDAI, SDAI, RAPID 3)<br>• Pain Reporting<br>• Medication adherence<br>• Mental and behavioural health statuses<br>• Functional Assessment Reporting (Usual activity, disease activity, etc.) |
| Data collected via sensors | • Connector to wearable devices available (but not explicitly for RA) |

| Screenshots |  |
| --- | --- |

**RA Monitor®**

| Country | US |
| --- | --- |
| Enterprise | RPM Healthcare, LLC |
| Type of service | Mobile App |
| Website | https://ra-monitor.com/ |
| Status | Market launch in 2017 |
| Description | Health monitoring app for patients and doctors. The monitoring app presents a clean interface and informative reporting. The patient's health monitoring system allows doctors to track RA symptoms so as to provide treatment plans. Patients can use the platform to self-monitor medications, trigger trackers, and more. The app has features for users to share symptoms, health analysis tools, and connect socially with other networks. The RA Monitor allows patients to access the support of their specialist (or an RA Navigator) and the anonymous community of other RA sufferers that a patient can interact with if you choose. Easy-to-read reports can be shared with others, such as family, friends, or healthcare providers [8].<br><br>Features:<br><ul><li>Highly intuitive RA Symptoms Tracker (Location, function impairment, weather, menstrual cycle, stress)</li><li>Medication Tracker (including effectiveness)</li><li>Easy to register and get started quickly</li><li>Connect to a specialist (or RA Navigator)—allows healthcare providers to follow your progress between visits. Change providers when you choose.</li><li>Anonymous social networking with other people with RA</li><li>Edit entries for any day using a calendar portal</li><li>Ability to share your symptoms, medication, and trigger reports</li><li>Detailed reports and insights screen</li><li>RA news updates</li></ul> |
| Market focus | Hospital & Health Systems, Product Partners, Research Institutions, Non-Profits, Pharmaceutical Companies, Primary Care & Subspeciality Clinics |
| Data collected via questionnaires | <ul><li>Disease activity</li><li>Pain reporting</li><li>Mental and behavioural health statuses (e.g. Stress level, fatigue, etc)</li><li>Medication adherence</li><li>Physical functions (e.g. sleep)</li></ul> |

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

As described, these main competitors and the aspects analysed will have a significant influence on the development of COTIDIANA App as well as for the business planning and exploitation strategy.

# 4. Insights for Business Plan

As we know, no app is an island - they should always be but a component of a patient/clinician engagement ecosystem. As such, an app might be only a part of the market approach to connect, engage, and convert the target audience with a digital resource they urgently need, simply understand, and eagerly use. Short of that an app is a bundle of code that at best becomes a statistic, and at worst jeopardizes your security or theirs.

That need for seamless connection and interoperability extends into healthcare stakeholder relationships, too. Exactly as apps must eventually become fully integrated into delivery systems, all vested players from app developers to regulators, institutions, payers, health systems, providers, and patients need to partner and work together to overcome industry barriers and capitalize on the incredible potential of digital health. The success of the COTIDIANA App can granted if all stakeholders understand their role and fulfil their vital call to action.

The conclusion is that there is the right context for a solution such as COTIDIANA to be implemented in the market, especially when taking into consideration the categories of the rheumatic patients as well as the clinicians, which can cope with the technological requirements of having a smartphone or tablet for using the solution/service.

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