# PROJECT MANAGEMENT PLAN

**Greepam**

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| --- | --- | --- |
|  |  | **RELATED ARTIFACTS** |
| **Reference** |  | **Artifact Name** |
| WBS | [Work](https://pmc.epam.com/pmc/document/detail.do?id=4050741400002828801) Breakdown Structure |  |

# 1 INTRODUCTION

## 1.1 DOCUMENT PURPOSE

The purpose of this document is to describe project management and related plans of the Greepam project. This document will be kept up-to-date by the EPAM Project Manager throughout the project.

This document applies to the Greepam project.

## 1.2 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

A brief description of the specific definition, acronyms and abbreviation, which be used during the project activity.

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| --- | --- | --- |
| **Abbreviation** | **Acronyms** | **Definitions** |
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# 2 PROJECT OVERVIEW

## 2.1 PROBLEM DESCRIPTION

Krakow is now firmly established as one of Europe’s top tourist destinations, attracting millions of visitors every year. Multinational companies are flocking here, as are young people unable to find jobs elsewhere in Europe. How long before awareness of the city’s poor air quality begins to make the city unattractive, threatening its economic health as well as the health of the people who live here? According to measurements taken by the Małopolska air monitoring network, the problem is very bad indeed. The network consists of 11 monitoring stations in the region, three of which are in Krakow (Al. Krasińskiego, ul. Bujaka, ul. Bulwarowa).

Krakowski Alarm Smogowy republishes pollution figures on its Facebook page, and points out some worrying trends: “In December 2012, residents of Kurdwanów could breathe safe air on only three days of the month, while in the city centre there was only one day with safe air.” In November 2015, pm10 levels have reached 281,2 µg/m3, over 540% “normal” levels— though research has shown that any level is risky. Nowadays, figures are even worse. It is obvious, that situation will not be solved by itself.

Particulates are not the only problem. Levels of highly carcinogenic benzopyrene and nitrogen dioxide, which has been shown to inhibit lung function, are also high. Unsafe nitrogen dioxide levels are only recorded in three Polish cities: Warsaw, Wrocław and Krakow, where EPAM operates.

Two things work against Krakow’s air quality: pollution and geographical factors that prevent the dispersal of pollution. The two major sources of the most harmful pollutants are domestic solid fuel furnaces and motor vehicles, but local industry and air-borne pollutants from other parts of Poland and neighbouring countries also contribute.

Geographically, Krakow sits in a valley, which tends to concentrate pollutants, and experiences a low number of windy days, which means pollutants are not readily dispersed.

In October 2015 President Duda signed a revised environmental law, with the support of Krakow Mayor Jacek Majchrowski, aiming to rid the city of coal furnaces by 2019. It ends a period of back-and-forth struggle between the Małopolska regional assembly and the Supreme Administrative Court, which had blocked an earlier resolution.

Yet the problems of funding and enforcement remain. Krakow has had a programme subsidising the replacement of solid fuel furnaces for many years, but it is proceeding at a glacial rate. Krakowski Alarm Smogowy note that, at the current rate of replacement, it could be decades before the last domestic furnaces are gone. One problem is that poorer Cracovians are unenthusiastic about getting rid of their coal-burning heaters, even with financial help, because it will simply result in higher fuel bills for their new heating system.

### 2.1.1 Project Goal

To encourage EPAMers to become EcoPAMers:

1. Strengthening EPAM image of socially responsible corporate that contributes to sustainable development of local society by promoting ecological means of transport. To achieve that, Greepam will deliver software to track employees commute activities to reward individuals who act in an ecologically responsible way.
2. Optimizing office resources in terms of parking space usage by optimizing number of cars needed for employees to reach the office and monitoring employees commuting habits.

### 2.1.2 Project Objectives

* Strengthening EPAM image of socially responsible corporate that contributes to sustainable development of local society by promoting ecological means of transport. To achieve that, Greepam will deliver software to track employees commute activities to reward individuals who act in an ecologically responsible way;
* Optimizing office resources in terms of parking space usage by optimizing number of cars needed for employees to reach the office and monitoring employees commuting habits.
* Protecting and preserving natural environment;

## 2.2 ASSUMPTIONS AND CONSTRAINTS

Considering value of Greepam for EPAM in matter of public image and potential of contribution in Polish ecological environment improvement, Project planning, implementation and quality should satisfy highest company standards. From the very beginning, Project has dependencies on external services, systems (geolocation tracking) and third parties (like companies-owners of EPAM office buildings) which establishes different challenges in following aspects:

* Frequent and effective communication with third party companies
* Specific technical requirements to project team members skills
* Innovative nature of project require innovative way of thinking and innovative way of implementation

Project specific requires active engagement in project ecosystem usage (including mobile application) from each project team member. Also, each team member will be providing feedbacks continuously of application usage in order to improve quality, user experience and effectiveness of Greepam. We expect, that each team member will document any bug/defect which will be detected during Greepam usage.

We expect that each team member will apply eco way of life, which means that team members will reduce unnecessary private car usage in favor of using private/city bikes, public transportation and car polling.

# 3 PROJECT ORGANIZATION

## 3.1 TEAM COMPOSITION (ROLES AND RESPONSIBILITIES)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MILESTONE** | **STEP** | **DESCRIPTION** | **Initiator 1** | **Initiator 2** | **Initiator 3** | **Project Manager** | **Architect** | **UX Designer** | **Development Team Lead** | **Backend Developer** | **Web Developer** | **Mobile Developer** | **Quality Assurance 1** | **Quality Assurance 2** | **Public Relations** |
| **Project Start** | 1 | Prepare outcome description | **A/R** | **I/C** | **I/C** |  |  |  |  |  |  |  |  |  |  |
| 2 | Prepare demo screens | **I/C** | **A/R** | **I/C** |  |  |  |  |  |  |  |  |  |  |
| 3 | Prepare plan, resources and budget estimation | **I/C** | **I/C** | **A/R** |  |  |  |  |  |  |  |  |  |  |
| 4 | Prepare presentation for the Management | **A/R** | **R** | **R** |  |  |  |  |  |  |  |  |  |  |
| 5 | Approval from EPAM Management | **R** | **A/R** | **R** |  |  |  |  |  |  |  |  |  |  |
| **Initiation** | 6 | Ensure Project Manager | **A/R** | **I/C** | **I/C** | **I** |  |  |  |  |  |  |  |  |  |
| 7 | Ensure developers and testers | **I/C** | **I/C** | **I/C** | **A/R** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** |  |
| 8 | Ensure hardware, software, testing tols | **I/C** | **I/C** | **I/C** | **A/R** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** |  |
| 9 | Ensure PR availability | **I** | **A/R** | **I** |  |  |  |  |  |  |  |  |  | **I/C** |
| 10 | Ensure office space | **I** | **I** | **A/R** | **I/C** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** |  |
| **Design** | 11 | Gather information about public transport | **A/R** | **I** | **I** | **I** | **I** | **I** |  |  |  |  |  |  |  |
| 12 | Gather information about parking places | **I** | **A/R** | **I** | **I** | **I** | **I** |  |  |  |  |  |  |  |
| 13 | Research software physics | **I** | **I** | **I** | **I** | **A/R** |  | **R** | **I** | **I** | **I** |  |  |  |
| 14 | Research external API for software solution | **I** | **I** | **I** | **I** | **A/R** |  | **R** | **I** | **I** | **I** |  |  |  |
| 15 | Prepare with PR benefits policy | **I** | **I** | **A/R** | **I** | **I** | **I** |  |  |  |  |  |  | **R** |
| 16 | Design software architecture | **I/C** | **I/C** | **I/C** | **I** | **A/R** |  | **I/C** | **I** | **I** | **I** | **I** | **I** |  |
| 17 | Design UX and GUI mobile and web look | **I/C** | **I/C** | **I/C** | **I** | **A/R** |  | **I/C** | **I** | **I** | **I** | **I** | **I** |  |
| 18 | Plan software milestones and tests | **I/C** | **I/C** | **I/C** | **A/R** | **R** |  | **R** | **I** | **I** | **I** | **I** | **I** |  |
| **Software Implementation** | 19 | Project Management | **I** | **I** | **I** | **A/R** |  |  |  |  |  |  |  |  |  |
| 20 | Iterative backend implementation | **I** | **I** | **I** | **A** | **C** |  | **R** | **R** | **I** | **I** | **I** | **I** |  |
| 21 | Iterative GUI implementation | **I** | **I** | **I** | **A** | **C** | **C** | **I** | **I** | **R** | **R** | **I** | **I** |  |
| 22 | Initial user tests of all use cases | **I** | **I** | **I** | **I** |  |  | **I** | **I** | **I** | **I** | **A/R** | **R** |  |
| **Full and stable** | 23 | Ensure software stability on various platforms | **I** | **I** | **I** | **A** |  |  | **R** | **C** | **C** | **C** | **C** |  |  |
| 24 | Fixing bugs found in tests | **I** | **I** | **I** | **A** | **C** |  | **R** | **R** | **R** | **R** | **R** | **I** | **I** |
| 25 | End user prototype tests | **I** | **I** | **I** | **A** |  |  | **R** |  |  | **R** | **R** | **I** | **I** |
| 26 | Deploy stable software version | **I** | **I** | **I** | **A** | **C** |  | **R** |  | **R** | **I** | **I** |  |  |
| **Release and campaign** | 27 | Organize promotion campaign in EPAM | **C** | **C** | **A/R** |  |  |  |  |  |  |  |  |  | **R** |
| 28 | Organize opening party in EPAM | **A/R** | **C** | **C** |  |  |  |  |  |  |  |  |  | **R** |
| 29 | Organize public campaign in media (social media, local newspapers) | **C** | **A/R** | **C** |  |  |  |  |  |  |  |  |  | **R** |
| 30 | Project Management | **I** | **I** | **I** | **A/R** |  |  | **I/C** | **I/C** | **I/C** | **I/C** | **I/C** | **I/C** |  |
| 31 | Software support | **I** | **I** | **I** | **A** |  |  | **R** | **R** | **R** | **R** | **R** | **R** |  |
| **Research and observations** | 32 | Award users | **C** | **A/R** | **R** |  |  |  |  |  |  |  |  |  | **R** |
| 33 | Optimize usage of parking spaces | **A/R** | **I/C** | **I/C** |  |  |  |  |  |  |  |  |  | **I/C** |
| 34 | Research employees commuting habits | **I/** | **I/C** | **A/R** |  |  |  |  |  |  |  |  |  | **I/C** |
| 35 | Find out usage of tracking employees | **R** | **R** | **A/R** |  |  |  |  |  |  |  |  |  | **I/C** |
| 36 | Organize employees feedback (surveys) | **A/R** | **I/C** | **I/C** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **R** |
| 37 | Prepare presentation about results | **R** | **A/R** | **R** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I** | **I/C** |
| 38 | Present results and futher ideas to the Management | **A/R** | **R** | **R** |  |  |  |  |  |  |  |  |  | **I** |

## 3.2 METHODS OF WORK

Greepam team work will be based on two methodologies: waterfall for sequential work according to project plan and milestones and agile for software creation during work on milestone Software Implementation.   
Work on project will be divided into the following seven stages:

|  |  |  |
| --- | --- | --- |
| **Name** | **Start date** | **End date** |
| Project Start | 02.11.2017 | 24.11.2017 |
| Initiation | 27.11.2017 | 08.12.2017 |
| Design | 11.12.2017 | 16.01.2018 |
| Software Implementation | 17.01.2018 | 31.05.2018 |
| Full and stable | 01.06.2018 | 31.07.2018 |
| Release and campaign | 01.08.2018 | 31.08.2018 |
| Research and observations | 03.09.2018 | 28.09.2018 |

During Project Start phase project Initiators will prepare project outcome description as well as project plan and budget estimation together with some demo screen for the product. All of those will be presented to the EPAM Management. Phase ends with the Management’s approval.

Project Initiation phase is about ensuring resources for the project: people, hardware, software and office space. Project Initiations will find other members of a team: Project Manager, Architect, UX Designer, Development Team Lead, Backend Developer, Web Developer, Mobile Developer and two Quality Assurance specialists. As close cooperation with EPAM Public Relations team is needed during the Project, contact person from PR team will be designated to cooperate with the Greepam Team.

Design phase will consist of software requirement gathering, that will include gathering information about public transport and parking spaces. Based on that information Development Team will research physics used in the software application and potential 3rd party libraries be used. After that the Architect will prepare application architecture that would serve best for the Project. UX Designer will define ergonomic design for the users of mobile and web part of the application. Project Manager together with Initiators and Architect will divide development work into milestones, user stories and tasks.

In Software Implementation phase the application will be created by the Development team and tested by QA team. Work in this phase will be divided into smaller iterations planned in the previous stage.

Full and Stable phase will be about ensuring correctness of the software of various platforms (various phones, browsers), bug fixing and further tests by QA and Initiators testing prototype. Phase will end with deploying stable software release.

Next there will be Release and campaign phase during which the application will be advertised to the EPAM employees. Email and posters campaign will end in application presentation party for the Greepam team and the employees. Together with EPAM PR specialist Initiators will try to advertise the application in social media and local newspapers as an element of EPAM CSR policy. During this phase PM as well as Development and QA teams will be still occupied with support tasks.

In Research and observations phase active users of the Application will be awarded. EPAM employees will be invited to fill in a survey about the application and its outcome. Employees habits an commuting patterns will be analyzed and in terms of additional value to the company. Presentation about the results will be presented to the Management.

# 4 SCOPE MANAGEMENT

## 4.1 REQUIREMENTS MANAGEMENT

In Greepam project requirements management will be responsibility of the Project Manager. Initial requirements were collected during project initiation and are listed in the project plan. The scope was defined through a comprehensive analysis of company PR needs and policies during requirements collection process and is described in work breakdown structure as well as in deliverables specification. Some details of technical solutions will be specified upon completion of Initial design milestone, however overall technical design and requirements are clear. Feasibility the requirements was confirmed by the Architect.

Proposed scope changes may be initiated by stakeholders or any team member. All changes for scope have to be introduced in accordance with scope change management procedures defined in change management section.

Project manager supported by the architect and Development Team leader, will periodically verify progress of the project, at least once every sprint, in terms of scope, priorities and accordance to requirements. To ensure project is consistent with the scope, every interim and final deliverable as well as achievement of the milestone has to be accepted by Project sponsor during project status meeting. On the meeting Project Manager will present the deliverable and prove it’s coherency with requirements and schedule.

## 4.2 DELIVERABLES SPECIFICATION

This paragraph provides definition of expected deliverables, by stating what is required, what is optional and what is not part of the deliverables. Deliverables can be categorized as software and process, both leading to achieve primary goal of the Greepam project, which is development of Corporate Social Responsibility.

**4.2.1 SOFTWARE REQUIREMENTS**

Software deliverables include mobile applications (code name: Kompass), server side applications (code name: Tree house) and web interface applications (code name: Tree monitor)

Kompass should track commute from home location to destination being EPAMs office and back. User should have a possibility of specifying home location by address or coordinates. Destination is EPAMs office where user spends work time and user can select it from predefined list.

User should have a possibility of choosing in Kompass a mean of transport and Kompass should have ability to verify credibility of user choice and recognize the way user commutes, distinguishing five categories i.e. walking, riding a bike, public transport, car sharing, individual car commute.

Car sharing is defined as commuting by privately held car in group of two or more EPAMs employees that covers majority (at least 50%) of distance from home location to EPAMs office of each user that constitutes a car sharing group.

Kompass should track the path of commute and distance covered including name of the user, coordinates, velocity and stops

User can check in Kompass availability of the parking lot at present time and predicted at the time of arrival.

User should be warned by Kompass if there is little or no availability of parking lot at destination, specific for mean of transport chosen by the user.

User can check in Kompass benefits points gather in Greepam program. Benefit points should be graphically represented as tree leafs.

User can check in Kompass how much pollution would be emitted if instead of ecological commute, individual car commute was used.

Kompass should be able to execute on Android 5.0 or above and iOS 6.0 or above on medium price devices (up to $650)

Kompass should transfer all data in real time by mobile networks or WiFi to Tree house executing on remote EPAMs servers.

Tree house software should collect data from up to 1500 users at a time and store up to 60 days of history for users.

Tree house should calculate benefit points based on the algorithm developed in process part of the project.

Tree house should calculate and Tree monitor web interface should present summary of statistics of individual users and group of users, means they commute, their benefit points collected, path from users home to EPAM office on the map.

Tree house should calculate and Tree monitor should present opportunity to lower capacity of parking lots in case utilization is low.

Tree monitor web interface should present statistics of using parking lot capacity over past 30 days.

Tree monitor web interface should be compatible with Google Chrome ver. 42 or above, Microsoft Internet Explorer ver. 11 or above and Safari web browser.

All software should be documented in terms of architectural decisions made, usability, user manuals and contain test evidences for all use cases corresponding to requirements.

All third party libraries should have decision path documented (why and what were the alternatives) and usage of commercial third party software should be justified while its price be limited to $1000 in total.

**4.2.2 SOFTWARE CONSTRAINTS**

All software (Kompass, Tree house, Tree monitor) should support at least 1500 users (i.e. number of EPAM employees in Krakow in 2017) with specification as above, but not necessarily more than that. It is considered as nice to have, though not in scope of the project to make the software expandable for greater number of users. If there is a need to handle greater number of users, additional project need to be run.

All software functionality is limited to the borders of the Kraków city (Poland) and up to 15 kilometres away from city borders. It is out of scope for the project to adjust it to work for any other location.

Kompass software can use various data gathered and shared by the Smartphone it executes on, such as e.g. user location but for user privacy, it should not track anything that is irrelevant to the core functionality of the project.

Non-statistical data (that concerns individual users), private data and personal data gathered by the software should not be shared with any third party unless clearly stated and approved by the user.

**4.2.3 CAMPAIGN AND PROCESS DELIVERABLES REQUIREMENTS**

Campaign should be held in public media including local newspaper or magazine and local or national TV channel and at least 5 billboards in proximity of EPAMs office.

Campaign should consists of two parts: informing about initiative start and informing about progress and results 2-3 weeks after it has started.

Second part of campaign should include statistics about how much pollution was not emitted (particles and carbon dioxide) on average thanks to the initiative.

As part of promotional campaign, opening party to all EPAM employees should be given.

Process should design an algorithm for assigning benefit points (leafs) for the users that make use of ecological means of transport from home to EPAMs office.

Benefit points should be proportional to the distance covered (the longer distance covered, the more points assigned) and mean of commute.

Process should prioritize riding a bike and walking over public transport and car sharing should be least valuable in terms of benefit points for a unit of distance.

## 5 RESOURCE MANAGEMENT

**5.1 RESOURCE LIST**  
Resource list with details is presented in separate spreadsheet.

Resource lists includes:

Labor: Initiator 1, Initiator 2, Initiator 3, Project Manager, Architect, UX Designer, Development Team Lead, Backend Developer, Web Developer, Mobile Developer, Quality Assurance 1 and 2 specialists, PR specialist

Hardware: Computers, mobile phones, tablets

Software: 3rd party software

**5.2 STAFFING PLAN**  
Team size and structure are presented in Project Organization chapter.

**5.3 TRAININGS**

All the team members will be assigned from EPAM employees with regards of their skills: architecture, UX design, project management, front-end and back-end development so no additional trainings are planned.

**5.4 PROCUREMENT PLAN**  
Greepam Project Manager will provide oversight and management for all procurement activities under this project. The Project Manager is authorized to approve all procurement actions up to 100 000 PLN. Any procurement actions exceeding this amount must be approved by the Project Sponsor. While this project requires minimal or no procurement, in the event procurement is required, the Project Manager will work with the project team to identify all items or services to be procured for the successful completion of the project. The Project Manager will then ensure these procurements are reviewed and presented to the contracts and purchasing groups. The contracts and purchasing groups will review the procurement actions, determine whether it is advantageous to make or buy the items or resource required services internally, and begin the vendor selection, purchasing and the contracting process.  
In the event a procurement becomes necessary, the Project Manager will be responsible for management any selected vendor or external resource. The Project Manager will also measure performance as it relates to the vendor providing necessary goods and/or services and communicate this to the purchasing and contracts groups.

# 6 SCHEDULE MANAGEMENT

Project schedule was created in ProjectLibre application and includes milestones and deliverables presented in Work Breakdown Structure (attached in separate pdf file). Activity definition will identify milestones which must be performed to complete each deliverable. Activity sequencing will be used to determine the order of work packages and assign relationships between project activities. Activity duration estimating will be used to calculate the number of work periods required to complete work packages. Resource estimating will be used to assign resources to work packages in order to complete schedule development.

**6.1 ROLES AND RESPONSIBILITIES**

Initiator 1, Initiator 2, Initiator 3 are responsible for project outcome definition, gathering requirements, contacting EPAM Management and PR. They ensure resources an cooperate with Project Manager in milestones definition.

Project Manager is responsible for work coordination of Architect, UX Designer and Development and QA team. She participates in project milestones definition and activities division into iterations.

Architect, UX Designer, Development Team Lead, Backend Developer, Web Developer, Mobile Developer, Quality Assurance 1 and 2 specialists are responsible for software design, implementation and tests.

PR specialist cooperates with Initiators on defining award policy, organizing internal and external promotional campaign and results analysis.

EPAM Management consults and approves project scope and plan.

**6.2 SCHEDULE CONTROL**  
The project schedule will be reviewed and updated as necessary on a bi-weekly basis with actual start, actual finish, and completion percentages which will be provided by task owners. The project manager is responsible for holding bi-weekly schedule updates/reviews; determining impacts of schedule variances; submitting schedule change requests; and reporting schedule status in accordance with the project’s communications plan. The project team is responsible for participating in bi-weekly schedule updates/reviews; communicating any changes to actual start/finish dates to the project manager; and participating in schedule variance resolution activities as needed.

The project sponsor will maintain awareness of the project schedule status and review/approve any  
schedule change requests submitted by the project manager.

**6.3 WBS**

Attached in pdf.

**6.4 MAJOR MILESTONES AND MAIN WORK PACKAGES**

Details presents in section 3.2 Methods of Work

# 7 QUALITY MANAGEMENT

## 7.1 PURPOSE OF THE QUALITY MANAGEMENT PLAN

The purpose of the Greepam Quality Management Plan is to establish the activities, processes and quality standards required to implement effective quality management for the project and to deliver it according to highest EPAM quality standarts. This QMP defines how the Project Team will implement, support, and communicate project quality practices for use with the Greepam Project.

The Quality Management Plan will accomplish the following objectives for the Greepam project:

* Defines how quality will be managed
* Defines quality assurance (QA) activities
* Defines quality control (QC) activities
* Defines quality standards
* Defines roles and responsibilities in matter of quality assurance
* Defines basic set of tools

## 7.2 QUALITY MANAGEMENT APPROACH

The Greepam project quality management approach is to ensure quality is planned for both the project and processes.

Project scope includes not just a building a single mobile application, but ultimately a complete framework/ecosystem, which will be integrated with external systems. Quality management goal is to assure successful project finish and to gather as much knowledge as possible about project and process quality, which might be used in further product development for series deployment, eventually production. Gained knowledge and expertise might be shared on EPAM public conferences not only with knowledge/expertise sharing purpose but also to improve EPAM public image.

## 7.3 ESTABLISHING QUALITY STANDARDS AND REQUIREMENTS

The project team will determine quality standards and requirements, based on EPAM quality standards. In case if quality standards will be or should be changed/improved, then project team will discuss desired change/improvement and make a decision about changing/improving quality standards. In order to establish transparency and clearness in quality standards, they will be documented and will be accessible to each team member.

## 7.4 QUALITY ASSURANCE

### 7.4.1 Project Quality

Each team member is responsible for quality. In order to establish it on each project implementation stage, following processes will be applied:

* **Requirement analysis**. Will be performed by the project team on each project stage, during each sprint planning stage.
* **Code reviews**. Will be performed by developers, including development team lead. Any code change will not be introduced without successfully passed code review.
* **Milestones reviews.** Wil be performed by the project team after each Milestone delivery.
* **Test design implementation and execution**. Will be performed by the QA engineers on planned matter, during each sprint.
* **Defect management.** Will be performed by the project team.
* **Continuous integration.** Willbeestablished by the development team lead. Basic pipeline should include automatic builds of components, before and after each commit to the version control repository, automatic deployment of newly built components on test environments, automatic unit tests execution and automatic build reporting to the project team.

Each sprint deliverables, as well as milestone iterations should pass through specific quality gates, which has following quality metrics:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Iteration type | Number of critical defects | Unit tests coverage | Test cases pass rate | Test coverage |
| Sprint | <2 | >50% | >75% | >70% |
| Milestone | 0 | >75% | >90% | >90% |

In case if quality gate was not passed, PM still has a possibility to proceed with delivery, taking into account all possible risks.

### 7.4.2 Delivery Process Quality

In order to have continuous and frequent feedback about project quality, project team delivery and development process will be based on a Scrum software development methodology. According to Scrum, following processes will be established:

###### **Planning meetings.** Will be performed for each sprint or milestone.During these meeting, team defines delivery scope, priorities and deliverables.

###### **Retrospective meetings.** Will be performed for each sprint or milestone. During these meetings, team will discuss identified impediments, suggest and discuss possible project improvements and discuss identified effective processual aspects, which should be kept doing.

###### **Daily Standups**. Will be conducted on a daily basis at the beginning of the day be the project team, including PM.

## 7.5 QUALITY CONTROL

There are several project-specific quality standards which were established specifically for the Greepam project:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Functionality | Type | Acceptable standards | Measurements | Quality assessment activities | Responsible | Assessment intervals |
| GPS polling rate | Geolocation | 1 request per 1 second (+- 0.3 seconds) | Requests per second | Lab and field testing | QA engineers and developers | According to test plan |
| Tracking distance | Geolocation | +-100 meters from current position under clear sky | Distance in kilometers | Lab and field testing | All project team members | Every working day |
| Type of movement detection | Geolocation | +-0.5 km/h under clear sky | Speed in km/h | Lab and field testing | All project team members | Every working day |
| Eco ratings calculation | Statistics | Performed not later than 23:59 each day | EcoPoints | Lab and field testing | All project team members | Every working day |

Project QA engineers will perform all related measurements, according to test plan. Project team members will be gathering related measurements on a daily basis, during their trip from work to home and from home to work, using their mobile phones. The project team will analyze gathered data on a weekly basis. If any of measurements will not be in range of acceptable standards, then defect should be raised, analyzed and planned for fixing.

## 7.8 QUALITY MANAGEMENT RECORDS AND REPORTS

In order to track, assess and manage quality, Greepam will use following Quality artifacts/records:

* **Test plan.** Will be designed by QA engineers, will be approved by the PM for each milestone iteration. Will be stored on a team share drive
* **Test cases.** Will be based on requirements and designed by QA engineers. Will be stored in JIRA
* **Test execution reports.** Will be created by QA engineers and stored in JIRA. Also, Unit test execution reports will be created by CI tool and stored in the tool.
* **Bug reports.** Can be created by any team member. Will be stored in JIRA
* **Measurement reports.** Will be created by QA engineers and stored on a team share drive.

Maintaining these records will provide objective evidence and traceability of assessments performed throughout the entire projects and product life cycle. Also, they might be used as an input for identifying new issues or predicting potential issues as well as an additional input for risk management.

**7.8 QUALITY MANAGEMENT TOOLS**

In order to track and manage the quality, following tools will be used:

* JIRA – Project management, bug reporting and test management tool
* TeamCity – Continuous integration tool
* SonarQube – Code static analysis tool

# 8 PROJECT BUDGET

Detailed budget presentation is provided in attached excel Resources\_Budget.xlsx. Cost and Schedule performance Index (CPI and SPI respectively) will be reported on a monthly basis by the Project Manager to the Project Sponsor. Variances of 10% or +/- 0.1 in the cost and schedule performance indexes will change the status of the cost to yellow or cautionary. These will be reported and if it’s determined that there is no or inimal impact on the project’s cost or schedule baseline then there may be no action required. Cost variances of 20%, or +/- 0.2 in the cost and schedule performance indexes will change the status of the cost to red or critical. These will be reported and require corrective action from the Project Manager in order to bring the cost and/or schedule performance indexes back in line with the allowable variance. Any corrective actions will require a project change request and be must approved by the CCB before it can be implemented.  
Earned value calculations will be compiled by the Project Manager and reported at the monthly project status meeting. If there are indications that these values will approach or reach the critical stage before a subsequent meeting, the Project Manager will communicate this to the EPAM Management immediately.

Costs for the Greepam project include:

Labor costs: 962 120 PLN

Software costs: 20 000 PLN

Hardware costs: 38 900 PLN

Logistics costs: 127 000 PLN

Contingency Reserve: 57 400 PLN

Management Reserve: 114 800 PLN

Project Baseline (including Contingency Reserve): 1 205 420 PLN

Total Project Cost (Project Baseline + Management Reserve): 1320 220 PLN

# 9 CHANGE MANAGEMENT PLAN

The Change Management Plan for Greepam Project describes and tacks the necessary information to effectively manage changes in the project from its initiation to the final delivery. It is a part of a planning phase of the Project. The intended audience of the Change Management Plan is the Project Manager, Project Team and EPAM Management. The change management plan defines procedure of change management and change lifecycle in order to implement any changes effectively and with minor negative impact. Any change should be precisely described, evaluated and reviewed by the project management. In case if change is decided to be applied, then it should be planned properly. Changes should be beneficial for the project, for the end users and should not cause any negative impact to the project delivery. All associated risks should be evaluated, managed and remediated.

## 9.1 SCOPE CHANGE FLOW

This Change Management Process describes the step-by-step procedure for tracking the submission, coordination, review, evaluation, categorization, and approval for all changes to the Project Plan.

**9.2 CHANGE REQUEST PROCESS FLOW**

As a prerequisite, any change of iteration scope should be discussed with the project stakeholders during appropriate meetings. Initial evaluation of change should be performed during these meetings and preliminary decision (to proceed with the change or not) should be made during these meetings as well. If project stakeholders decided to proceed with the change, then change request should follow specific flow.

The flow for a change request process is the following:

|  |  |  |
| --- | --- | --- |
| No | Step | Description |
| 1 | Create | A CR submitter completes a CR Form (raises a new issue in JIRA with issue type “Change request”) and sends the completed form to the Change Manager – Project Manager. Submitter is prepared to answer all the questions from Change Board |
| 2 | Evaluate | Key project stakeholders (including Architect) together review the CR and provide an estimated level of effort to process, and develop a proposed solution for the suggested change. |
| 3 | Authorize | Approval to move forward with incorporating the suggested change into the project/product |
| 4 | Implement | If approved, necessary adjustments are made by the Greepam Team to carry out the requested change and communicate CR status to the submitter and other stakeholders |

JIRA should be used as a CR management tool. Should be created and maintained specific JIRA board for CRs only.

# Change Request Form

|  |  |
| --- | --- |
| Element | Description |
| Date | The date the CR was created |
| CR# | Assigned by the Change Manager |
| Title | A brief description of the change request |
| Description | Description of the desired change, the impact and benefits of a change |
| Submitter | Name of the person completing the CR Form and who can answer questions regarding the suggested change |
| Contact details | Phone number and email of the submitter |
| Version | The product version that the suggested change is for |
| Priority | A code that provides a recommended categorization of the urgency of the requested change (High, Medium, Low) |

## 9.3 EVALUATING AND AUTHORIZING CHANGE REQUESTS

During Change Request evaluation phase the priority and type of the change are taken into consideration. Allowed values for Priority are: from High, Medium and Low depending on how much Scope/Budget/WBS is affected. For example low priority change for Greepam Project would be Mobile Application icons set change whereas changing of third party library used in the backed phycics engine would serve as high priority change.

Change requests are evaluated and assigned one or more of the following change types:

|  |  |
| --- | --- |
| Type | Description |
| Scope | Change affecting scope |
| Time | Change affecting time |
| Duration | Change affecting duration |
| Cost | Change affecting cost |
| Resources | Change affecting resources |
| Deliverables | Change affecting deliverables |
| Product | Change affecting product |
| Processes | Change affecting process |
| Quality | Change affecting quality |

Change requests are evaluated and assigned one of the following status types:

|  |  |
| --- | --- |
| Status | Description |
| Open | Entered/Open but not yet approved or assigned |
| Work in Progress | CR approved, assigned, and work is progressing |
| In Review | CR work is completed and in final review prior to testing |
| Testing | CR work has been reviewed and is being tested |
| Closed | CR work is complete, has passed all tests, and updates have been released. |

### 9.4 CHANGE CONTROL BOARD

A Change Control Board for Greepam Project is a formally constituted group of stakeholders responsible for approving or rejecting changes to the project baselines. This group may meet on a predefined schedule or on an as needed basis. The table below provides a brief description of personnel acting as the Change Control Board (CCB) and their role/level of authority within that group. Please note that only changes affecting scope, time, duration and cost would need consultation of EPAM Management. The rest of types will be handled by the Greepam Team.

|  |  |
| --- | --- |
| Role | Responsibility |
| EPAM Management | Approves/rejects the changes affecting scope, time, duration and cost |
| Initiators | Participate in defining change Type and priroty  Participate in Defining Resolution  Present changes to the EPAM Mangement  Evaluate the need and impact of the change |
| Project Manager | Participate in defining change Type and priroty  Participate in Defining Resolution  Responsible for Implementing the Change affecting  Evaluate the need and impact of the change |
| Architect | Participate in defining change Type and priroty  Evaluate the need and impact of the change |

# 10 RISKS MANAGEMENT

|  |  |  |
| --- | --- | --- |
| Risk | Description of the risk | Probability / Impact |
| Legal | Project assumes usage of a car, bike and public transportation at the initial design phase as well as in implementation, to understand physics of commute and gather metrics needed for recognition of how individuals commute. That results in specialists (developers, testers) travel across the city without business trip purpose. Currently EPAM has no procedures for expediting employees to experiment and gather measures in that way. In addition, driving a car with passengers with company car requires medical and psychological certificate. | Low / Low |
| Outdoor condition | Weather condition can delay outdoor activities related to initial design and recognition of physical nature of commute. | High / Low |
| Accidents | Due to unusual task of gathering physical data and outdoor activities, the risk of accident is far higher than in the case of indoor, office work. In addition, damage of equipment can delay project | Low / Medium |
| Technical issues | EPAM has little experience and few local experts in the discipline of physics and measurement, hence the task of understanding physics of commute is hard to estimate in terms of schedule and difficulty. | Low / High |
| External data access | Finding reliable, precise external API or database with public transportation maps and schedules might be difficult, which jeopardizes use case of public transportation. | Low / High |
| Property management | Property management company at which EPAMs rents office and park space (Buma group) might be unwilling to share information about entrance and presence of employees cars. | Low / Low |
| Staffing | Due to low criticality of the project to EPAMs business continuity it may happen employees could be moved to projects of higher importance affecting deadlines. Budget can also be decreased and moved to different, higher priority projects | Low / High |
| Success of campaign and software | Campaign may cause public interest and demand on the application and other organizations may find it useful. In addition, EPAM may find tracking of employees habits useful. If everything works as expected, savings can be made thanks to optimization of parking lot usages | Medium / High |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk identification** | **Quantitive risk** | | | | | | **Risk response** | |
| **Risk** | **Risk category** | **Probability 0-10** | **Impact 0-10** | **Risk score 0-100** | **Risk ranking** | **Risk response** | **Trigger** | **Risk owner** |
| **Legal** | | | | | | | | |
| No certified company car driver | Regulatory | 3 | 8 | 24 | 4 | Transfer | Preparation failure |  |
| Lack of procedures for outdoor labour work | Governance | 3 | 3 | 9 | 10 | Contingency | Preparation failure |  |
| **Climate and outdoor condition** | | | | | | | | |
| Physical measurements delay due to bad weather | Operational | 8 | 4 | 32 | 2 | Contingency | Force majeure |  |
| **Accidents** | | | | | | | | |
| Road accidents and damage of equipement | Operational | 2 | 8 | 16 | 7 | Transfer | Accident |  |
| Accidental body hurts during physical measurements | Operational | 1 | 8 | 8 | 12 | Accept | Accident |  |
| **Technical issues** | | | | | | | | |
| No expertise in physical measurements | Governance | 3 | 8 | 24 | 4 | Transfer | Lack of knowledge |  |
| Hardware failures | Operational | 1 | 5 | 5 | 14 | Contingency | Accident |  |
| Delays due to unpredictable activities | Operational | 3 | 3 | 9 | 10 | Contingency | Lack of knowledge |  |
| **External data access** | | | | | | | | |
| Fail to find precise city maps | Strategic | 1 | 3 | 3 | 15 | Accept | Wrong assumptions |  |
| Fail to find reliable public transportation schedules | Strategic | 3 | 3 | 9 | 10 | Accept | Wrong assumptions |  |
| **Property management agreement** | | | | | | | | |
| No agreement on sharing parking lot data | Strategic | 2 | 3 | 6 | 13 | Accept | Wrong assumptions |  |
| **Staffing** | | | | | | | | |
| Specialists move to higher priority project | People | 3 | 5 | 15 | 8 | Escalate | Organization |  |
| Specialists work inefficiently due to partial involvement | People | 2 | 5 | 10 | 9 | Mitigate | Organization |  |
| Budget decreased due to higher priority projects | Financial | 2 | 5 | 10 | 9 | Contingency | Organization |  |
| **Success of campaign and software** | | | | | | | | |
| High demand for releasing application publicly | Strategic | 4 | 4 | 16 | 7 | Exploit | Project success |  |
| Ideas for employees tracking utilization | Governance | 3 | 6 | 18 | 6 | Exploit | Project success |  |
| Savings made on parking lot rent | Financial | 5 | 5 | 25 | 3 | Exploit | Project success |  |
| High visibility of EPAM in media | Strategic | 5 | 7 | 35 | 1 | Exploit | Project success |  |

# 11. CLOSE-OUT PLAN

Greepam