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Sample Technical Strategy MDPeople Mobile App Creation

*This document serves as a sample tech strategy, demonstrating the outcomes you can expect from MobiDev's tech strategy consulting services

prepared by

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1. MDPeople Project Vision

1.1 'MDPeople' Product

MDPeople is developed, owned and used by MobiDev. MDPeople is an internal human resources management tool that allows users to view the company's structure, peoples' profiles, contact information, working schedules, manage vacations, sick leaves and many more. It allows PMs to request people on the projects, view and manage their workload, generate reports, and so on.

The system roles include:

- Super Admin
- Employee
- HR Manager
- Head of Delivery
- Resources Manager (RM)
- Project Manager (PM)
- Group Leader (GL)
- Deputy GL
- Team Leader (TL)
- Finance Manager (FM)
- Event Manager
- Recruiter
- Financial
- Intern

MDPeople components include:

- web application
- backend
- APIs

It is primarily built using Angular 12 technology for the web application and Node.JS (Express/Nest.JS for the backend). Web-application supports only desktop devices and browsers.

1.2 Vision

Vision Statement	Description	
Product Goal	Company management processes automation	
Client's Goal	More streamlined and effective company management with the help of the MDPeople	
Target Audience	MobiDev's staff	
Needs	 Quickly find and get info about company employees Team allocation Workload management Staff management 	
Value	All the departments of the company will get functionality for the main processes that will simplify their work	

1.3 Functional modules

#	Feature	Needs Overview		
1	Log in	Ability for users to log in to the MD People system	the MD People company members with their corporate	
2	User profile	Ability to view own profile and full profile and profiles of other users Ability to view own full profile All users can view their own profile and full profile (with the ability to request changes to their profile) with work schedule and events feed. Also, users can view profiles of other employees.		
3	Search	Ability to search for other users	All users can search for other users using different filters.	
4	Company structure	Ability to view and manage the company structure	Users can view the company structure hierarchy and all teams/departments. HR Managers can manage the structure.	
5	Users CRUD	Ability to add and manage users in the system employees in the system so that they a considered in the company processes system level and have access to a system general.		
6	Roles & Permissions	Ability to create roles in the system, assign permissions to a role and assign role(s) to a user HR Managers can create roles for a cert. position or structural department, set permissions and assign a role to employ so that they can utilize functionality according to their position.		
7	Vacation module	Ability to request and log leaves/vacations. Ability to process work schedule and time is automatically tracked in JIRA. HR managers can process requests where approval is required and have access to a history of all requests.		

#	Feature	Needs	Overview	
8	Cities	Ability to manage Employee's geographical locations in the system HR Managers can add and manage of the system in order to highlight the employee's current location		
9	Positions	Ability to manage company positions	HR Managers can add and manage positions to the system in order to highlight the employee's position and help other employees understand the employee's expertise.	
10	Team Member Requests	Ability to request developers for a project Ability to process allocation requests by resource managers	PMs can fill a team member request when they have a need to expand a team or replace a member. Request is submitted to resource managers and TL for further processing.	
11	Calendar	Ability to manage yearly calendar (public holidays) for different countries	y HR and Event managers can manage yearly calendars so that public holidays and work schedules are displayed in accordance with the employee's residence.	
12	Review Module	Ability to gather feedback about team member performance Ability to manage PDP documents Ability to manage the 'Review' and 'Feedback' forms	All users can submit feedback about their engagement with a team member, TL, etc and about their level of performance. Team and Group leaders can use the following functionality for ease of "Performance Review" procedure: • create and manage feedback and review forms and send them to other employees who need to get feedback from. • review all feedback in one place • create and manage PDP docs for their subordinates	
13	Contracts	Ability to create and manage contracts in the system	· · · · · · · · · · · · · · · · · · ·	

#	Feature	Needs	Overview	
			work regulations and working conditions that must be followed.	
14	Project Team Table	Ability to manage project workload and team composition	HRs, Financial Department, Project Managers and Team Leaders can utilize PTT for managing employee's workload, requesting team members, and managing a project.	
15	R&D Workload	Ability to view the workload of the company employees	Resource managers and Team Leaders can view employees' workload for past and future periods in order to be able to plan the workload.	
16	People schedule	Ability to view and manage people's work schedule		
17	Occupation time limits	Ability to manage the occupation time limits	Super Admin can set up occupation time limits that are utilized in the PTT module for calculation and planning of workload.	
18	Notification settings	Ability to set up RDWL notification settings	Resource Manager can set up RDWL notifications so that the system sends email with changes and updates in the RDWL table.	
19	Directions management	Ability to add and manage company directions (dev., mngmnt, fin., HR, etc)	HR Managers can add and manage company directions to the system in order to assign directions' leads.	

1.4 Monetization

Currently not considered

1.5 Success Metrics

- All modules of the system are easy to use and allow you to simplify the work of the department for which they are intended
- Reduced manual work required personnel management
- Reduced number of sources of information used by different departments from at least 7 to one system that is simple to use

2. The existing project state

The current version of the MDPeople is fully functional and is used to solve the company's business needs. MDPeople has a client-server architecture and consists of the following components:

1. Frontend

- **Technologies:** JS, TS, Angular, bootstrap, rxjs.
- **Role:** Responsible for the user interface and interactions. Sends requests to the backend and displays received data.

2. Backend

- **Technologies:** Node.js, Express, Sequelize.
- **Role:** Processes requests from the frontend, executes business logic, interacts with the database, local cache, and returns responses to the frontend.

3. Interaction through API

- **Request types:** The frontend sends HTTP requests (GET, POST, PUT, DELETE) to the RESTful API provided by the backend.
- **Responses:** The backend returns data in JSON format, which the frontend processes and displays rendered components to the user.

4. Data storage

- **Database:** Relational database PostgreSQL is used.
- **Access:** The backend interacts with the database for reading, writing, updating and deleting different data.

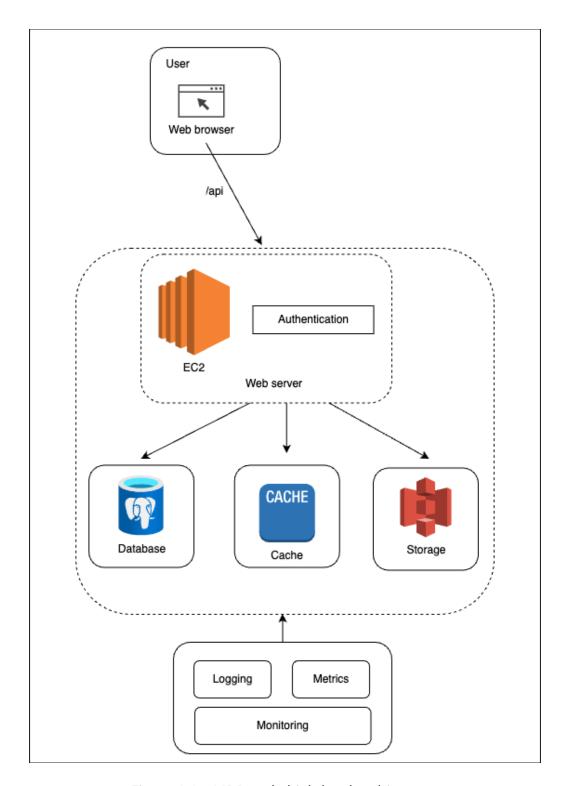


Figure 1.1 – MDPeople high-level architecture

2.1. Code

Repositories (access is needed):

Backend - https://gitlab.confidential/link-replacement

Frontend - https://gitlab.confidential/link-replacement

Backend (BE) Technology Stack:

- **Node.js:** JavaScript runtime.
- **Express.js:** A minimalistic web framework for creating robust APIs.
- Sequelize: ORM for Node.js.
- **Passport.js:** Auth middleware supporting various strategies.
- **Swagger:** Tool for documenting RESTful APIs.

Frontend (FE) Technology Stack:

- **Angular:** A platform and framework for building single-page client applications.
- **RxJS:** Library for reactive programming using observables.
- Angular Material: UI component library for Angular.

Summary:

The BE and FE projects include an up-to-date README file, which provides the necessary documentation for developers.

The code follows project style guidelines and is written in a tolerant manner. The FE application follows the DRY principle, but in the BE part of the application, you can often find code duplication that could be minimized or completely removed. The FE code is clean and easy to read, but BE has a lot of large functions with difficult-to-read code. Sometimes you can find commented-out lines and hardcoded code in both BE and FE.

Errors are handled at the appropriate logic level, with informative error messages provided. Exceptions and errors are handled in the whole application, BE sends errors to the Sentry, so everyone with access to the service can view the error stack trace and additional details, FE just shows user-friendly messages.

Neither the BE nor the FE have any tests, only QA writes automated tests using the JS + Mocha framework that runs on every BE deployment.

2.2. Infrastructure

Hosting Provider: AWS is the primary hosting provider. AWS provides a range of cloud computing services, key services used: EC2, S3, and RDS.

Documentation of Infrastructure: There is currently no infrastructure documentation available. It is crucial to develop and maintain detailed documentation to clearly understand the infrastructure setup, configurations, and dependencies if any.

CI/CD Automation: Jenkins is used as the CI/CD tool to automate the deployment pipeline, providing quick and reliable delivery updates.

Key metrics:

Metric	Comments
Scalability	Horizontal scalability: There is no ability to add more instances to handle increased load because of stateful architecture Vertical scalability: It is possible to upgrade the instance type for higher performance
Uptime	Current Uptime: 99% over the past quarter Downtime Incidents: Minimal with quick recovery
Performance	Response Time: The average response time of endpoints is 200ms. Throughput: Capable of handling hundreds of requests per second.
Security Metrics	Regular scans with zero critical vulnerabilities

Conclusion:

The current infrastructure setup faces significant challenges due to the lack of documentation and scalability issues. Immediate attention is required to address these gaps to improve performance, reliability, and technical documentation.

2.3. Interface

The current version of the MDPeople (web application) is a bit outdated. The design review report is located here: https://mobidev.confidential/link-replacement.

At the moment the current team is working on the new version with improved UI/UX. The web application supports desktop resolutions only (1024x768 and more).

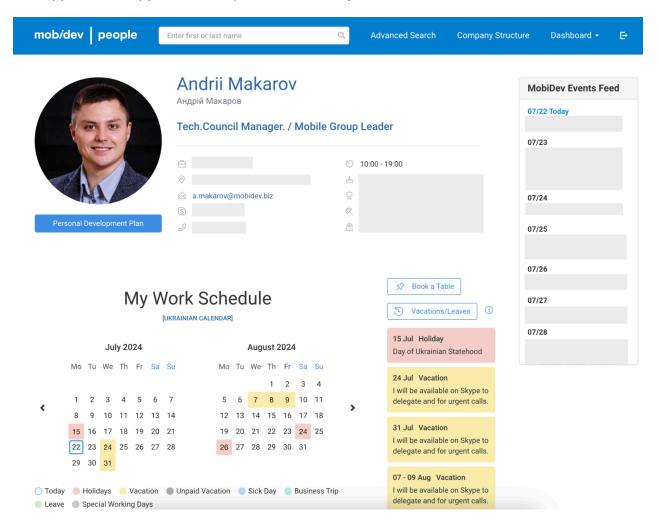


Figure 2.1 – MDPeople desktop version of the web application

Supported OS:

- Windows
- macOS
- Linux

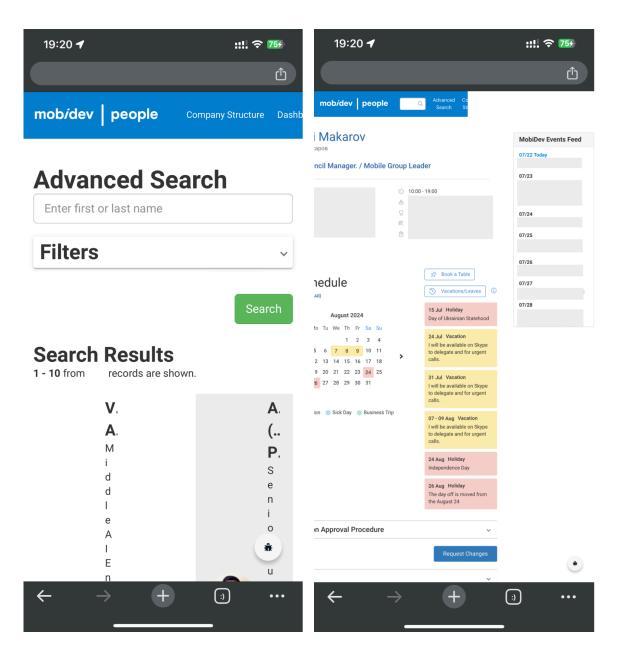
Supported browsers:

- Safari
- Chrome
- Firefox
- Opera

Used tools:

• Figma

The current web application also works on tablets but is not being tested with touch input and is not optimized for mobile phones (see screenshots below) – some buttons can't be pressed, text is shrinked as a result – web applications can not be used on mobile phones properly.



Figures 2.3, 2.4 - MDPeople in mobile browser

Summary:

The design of the current web application is to be improved and implemented by the current team. The design of the application should be created from scratch keeping in mind Apple and Google Design Guidelines and corporate brand book.

3. The desired project state

The goal is to build a mobile application for the MDPeople product keeping existing web application and backend.

MVP version must cover the following user roles:

- Employee
- HR Manager
- Head of Delivery
- Resources Manager (RM)
- Project Manager (PM)
- Group Leader (GL)
- Team Leader (TL)

Supported platforms:

- iOS 17.0 and newer
- Android 10.0 and newer

Other:

- The web application will remain the main one, the mobile application will give additional value
- The mobile application development must not affect the web application development process and/or its infrastructure. Since the web application was initially planned as a single platform, API versioning was not implemented, however, it must be implemented during this phase.
- The mobile and the web applications will use the same API but different versions if needed which is to be implemented
- The mobile application must follow mobile design principles and follow corporate UI guidelines

The mobile application may be implemented with Native or Cross-platform technologies, the key point is to have functional, high-performance applications with dynamic layout. The mobile application must use the existing backend.

4. Limitations

MDPeople system (web application and mobile application) must have the following characteristics:

Туре	Limitations	
Time	First version of the MDPeople Mobile must be released within 4 months.	
Budget	First version of the MDPeople Mobile must be implemented within the budget of \$100K	
Quality	The app must perform without obvious and critical bugs on all platforms. The source code is clean, testable and easy to support. The mobile app must not affect the web application – its current state and future development. This will require API versioning. Current infrastructure has a lack of documentation and scalability issues.	
Performance	The system must support up to 1000 active users with the ability to easily scale up to 10000 active users. Release pipeline must take less than 2 days (not including review process by the stores).	
Security	The mobile application must follow <u>corporate security principles</u> .	

5. Solution

5.1 Solution description

The current backend team will continue to work on the existing backend and frontend resolving all critical issues (reliability, scalability etc.) and working on further updates.

The existing backend will be used for mobile application implementation. The current version of the API will be considered as Version 1.0. The MVP version of the mobile application will use API Version 1.0 which should not be changed over time, while the web application will migrate to API Version 2.0 which is based on Version 1.0 and may be changed over time.

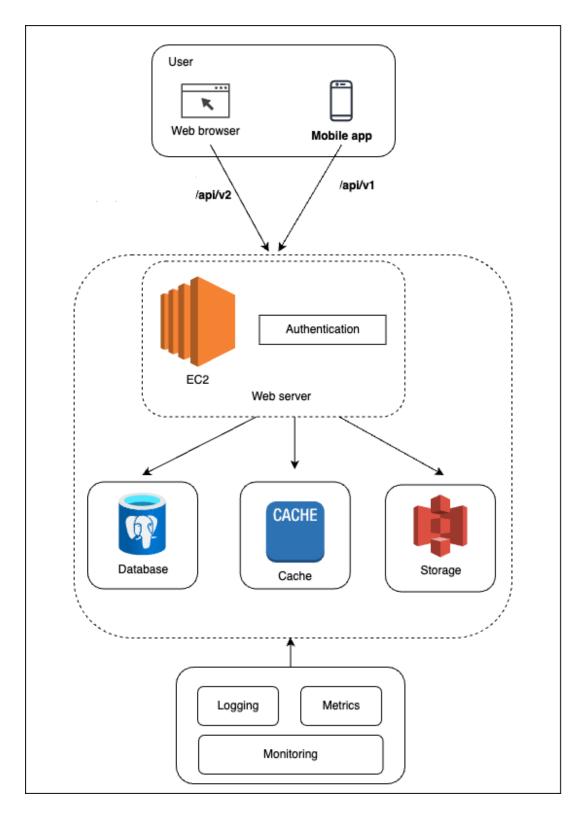


Figure 5.1 – MDPeople updated high-level architecture

5.2 Scope of work

UI/UX Design:

Task	Description
Design	Sketches, wireframes, UI design, slicing

Backend - Node.js, Express, Sequelize:

Task	Description
Implement API Versioning	Add API versioning to prevent conflicts during development of the mobile app and new version of the web app

Mobile – Flutter (iOS 17.0+, Android 10.0+) / Smartphones only / Dart:

Task	Description
Architecture	
- App architecture	Create base app architecture, base classes, import external open source libs
- Developer program management	Create developer certificate, add 15 devices, create developer and distribution provisioning profiles. CI/CD configuration.
- API Client	Base classes and data models for communication with backend via API
- Offline storage	Store company structure and employee profiles to enable offline access, reduce load on the backend and increase performance
- User role management	Switch logic according to the current user role
- Localization (English/Ukrainian)	Add multilanguage support
Login Module	
- Splash	Initial screen with company logo
- Onboarding	Page-based tutorial with 3-5 intro pages
- Login with email	Login using email and password provided by the company
- Login with biometrics	Login with face/fingerprint
- Logout	Logout and clear all cache and local data

Task	Description	
- Forgot/Change password	Add ability to reset or update password if needed	
Profile Module		
- Current user profile	User profile may vary based on current role, here users will see their personal info and main actions like open CV or personal development plan	
- Request changes	Adding ability to request changes in the user's profile by the means of sending requests to an HR manager for approval	
- Emergency phonebook	View with main contact persons in the company	
- Schedule	Custom calendar of an employee with working days, holidays, vacation etc.	
- Projects history	List of active and previous projects of a user	
- Vacations/Leaves	Request and edit vacations and leaves	
Company Tree Module		
- Company structure	Hierarchical view of the company structure with custom navigation panel	
- Users search	Search by users and positions	
- Other user profile	Adding ability to view other's profile and interact with it – view main info, schedule, history of projects etc. "Current user profile" will be reused	
Dashboard Module		
- News feed	View the latest news in the company and custom announcements	
- R&D workload	View team's workload based on user role and access level	
- Skills management	View and edit skills of the employee by RM/GL/TL	

5.3 Out of scope

A new development team will be responsible only for mobile application development using the existing API. Development of the new backend features and updates of the web application are not included.

5.4 Estimates

Role	Rate, \$*	Minimum efforts, h	Minimum budget, \$
UI / UX Design	\$45	120h	\$5 400
Business Analysis	\$45	24h	\$1 080
Back-end Development	\$45	100h	\$4 500
Mobile (Flutter) Development	\$45	920h	\$41 400
Quality Assurance	\$45	460h	\$20 700
Project Management	\$45	176h	\$7 920
Total:		1800h	\$81 000

^{* -} in case of MobiDev team

5.5 Technology stack

Taking into account that this project does not require any platform-specific features like Bluetooth, AR, background tasks, location services and so on, Flutter emerged as the most suitable choice for several compelling reasons:

- 1. **Cross-Platform Development**: Flutter allows us to develop a single codebase that works seamlessly on both iOS and Android platforms. This significantly reduces development time and costs compared to maintaining separate native applications for each platform.
- 2. **High Performance**: Flutter's architecture, built on the Dart programming language, provides excellent performance. It compiles directly to native ARM code, ensuring smooth and fast user experiences.
- 3. **Rich User Interface**: Flutter offers a wide range of customizable widgets that enable us to create highly engaging and visually appealing user interfaces with smooth animations.
- 4. **Fast Development Cycle**: The hot-reload feature in Flutter allows for instant code changes, making the development process more efficient. Developers can see the results of their changes in real-time, which speeds up the iteration and debugging process.
- 5. **Integration with Existing Systems**: Flutter's package Dio will allow us to interact seamlessly with the existing backend API and leverage the current infrastructure without extensive modifications. This ensures that data synchronization and communication between the mobile app and the website will be efficient and reliable.
- 6. **Cost-Effectiveness**: Flutter application will be twice as cost effective compared to native development.

In conclusion, the decision to use Flutter for developing the mobile application of the MDPeople is driven by its cross-platform capabilities, performance, development efficiency, rich UI possibilities and cost-effectiveness. Flutter is the best fit for the business needs and strategic goals, ensuring a high-quality mobile experience to our users.

5.6 Team structure

The development team should consist of the following specialists:

- Business Analyst
- Senior Flutter Developer
- Middle Flutter Developer
- Senior Backend (Node.js) Developer
- Designer
- QA Middle Engineer
- Project Manager

5.7 Phases breakdown

- Phase 1 Design
- Phase 2 Backend preparation
- Phase 3 Mobile app development
- Phase 4 Release to stores

5.8 Necessary input

- Access to GIT repository
- API Documentation
- Access to corporate Jira and Confluence
- Access to corporate brand book
- Access to App Store Connect and Google Play Console

5.9 Risk mitigation

Risk plan gives understanding about current project risks that may impact project delivery, schedule, cost, scope, or other project related activities:

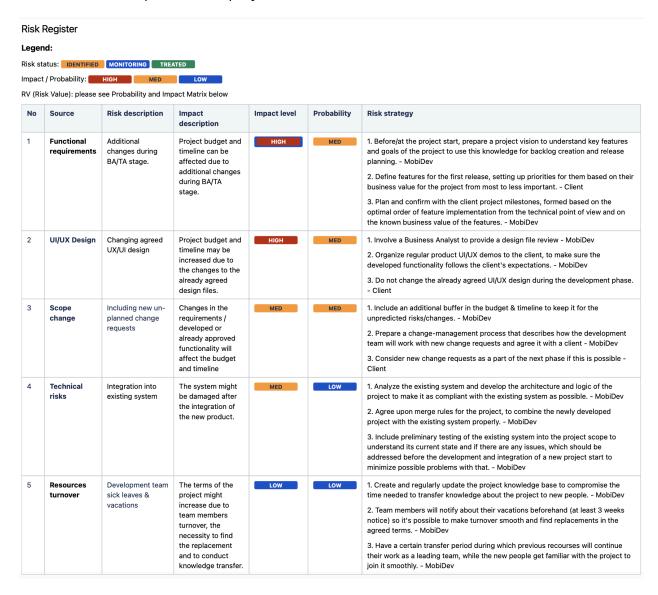


Figure 5.2 - Risk Register preview

Full Risk Register:

https://mobidev.confidential/link

5.10 Change Management workflow

The process allows to perform proper scope management to avoid scope creep and also ensure budget usage tracking depending on spending sources.

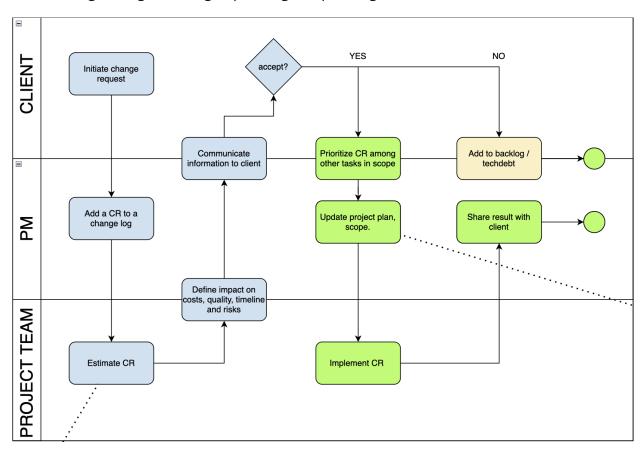


Figure 5.3 - Change Management workflow

6. Planning

6.1 Project Plan

Project plan allows to build clear expectations to project timeline. The artifact allows to visualize project development progress on a timeline and define checkpoints / milestones with valuable results delivery or other major events.

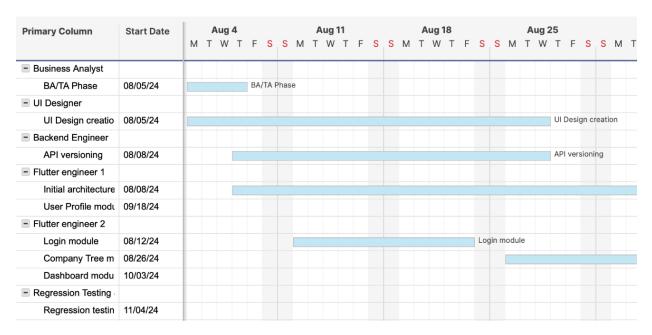


Figure 6.1 - Project Plan preview

Full project plan:

https://mobidev.confidential/link-replacement

6.2 Communication Plan

An effective communication plan allows to make the development process transparent and make sure that everyone is in sync on the project status. It also allows team members to stay aligned and get open questions resolved before they might become blockers for a team member or delivery overall.

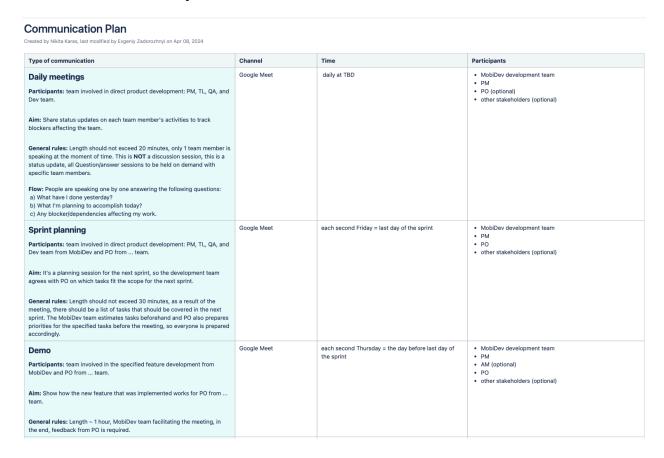


Figure 6.2 - Communication Plan preview

Full Communication Plan:

https://mobidev.confidential/link-replacement

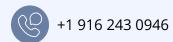
7. Next steps (in case with us)

- Conceptual agreement
- Proposal consideration
- Advantages consideration:
 - Deep interest in your business organization and goals for thinking strategically and minimizing the development risks.
 - Flexibility and variability in terms of development recommendations / consulting, understanding your limitations and standards.
 - No bus factor. We are a midsize business, not a freelancer.
 - Realistic planning, even in case of the input insufficiency.
 - Regular monitoring of how things stand and timely open matters negotiation

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Create an effective strategy for your product development or modernization with MobiDev!

Contact us to discuss your needs





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