A.C.A. Group

How composable apps transform business productivity

A modular approach to customizable mobile solutions

Introduction

When at work, most of us handle 5 to15 applications simultaneously — basic office tools, CRM, ERP, or custom-built back-end applications, collaboration and planning tools, and more. Unfortunately, these tools are often **poorly integrated**, requiring information from one application to be searched, copied, or retyped into another, potentially in a different format, and filtered accordingly. This lack of integration can lead to **several hours of time loss each day**.

In many companies, a significant portion of employees needs some level of 'mobility' in their roles. Think of operators, field service personnel, fleet and real estate managers, sales reps, workers in large industrial sites, and so on. For these mobile workers, juggling between applications and data becomes an even more significant efficiency drain. Sure, they might have a laptop, but using it on the road or during a customer meeting isn't that convenient.

Instead, many mobile workers have a mobile phone or tablet with various mobile apps — one for CRM, another for ERP, a calendar, and an email client. While this makes the experience more portable, it doesn't make it more efficient. In fact, navigating between data in different apps may be more cumbersome on mobile devices than on a laptop.

But, what if mobile workers would have **one integrated solution to handle all their tasks and activities** in an efficient way?

Well, there is!

Current mobile technologies make it possible and affordable to build **composable apps** that seamlessly integrate various back-end systems, **tailored to the needs of each 'mobile' employee** in your organization and while using the power and capabilities of mobile devices. This results in **productivity increases ranging from 20 to 50%**.

In this paper, we will explore different aspects of composable apps and how they can significantly enhance productivity in your organization. **In the subsequent chapters, we'll delve into:**

1. What are composable apps?

With composable apps we build mobile applications specifically **tailored to the needs of distinct roles within your organization**.

Each 'mobile' worker in your organization needs to access and update various information from various backend systems. Think of things like:

- Planning and task management
- Retrieving and updating client information from CRM
- Accessing data on products; specifications, maintenance schedules, parts, instructions, safety guidelines, ...
- Routing, finding locations, retrieving the location of devices and machines
- Creating, reviewing and sharing documents, certificates, etc.
- Managing timesheets, invoicing, and accepting client payments
- Identifying him/herself at customer locations and gaining access to company sites

Typically, this data resides in various backend applications, necessitating the mobile worker to manually access each application and combine information. This process is challenging when on the move with a laptop, often **requiring employees to handle it before and after completing their fieldwork**.

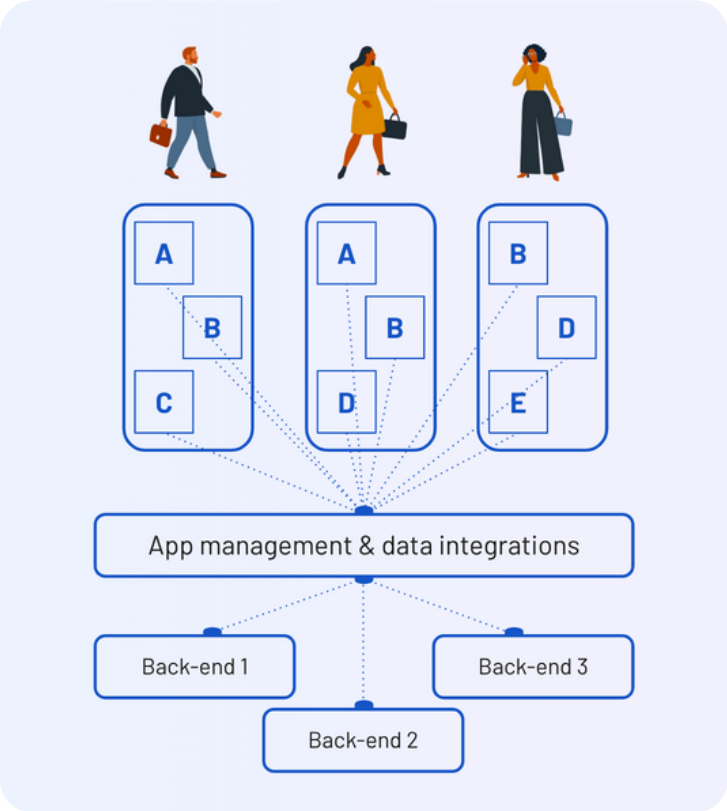
With composable mobile apps, we bundle all this information into a **single mobile experience** customized to the specific needs of a particular role. This experience comprises a tailored mobile app for phones or tablets, complemented by wearables and a desktop web interface as needed by the user.

One personalized app with modular functionality

During app development, we adhere to a strict modular approach. We start with a 'canvas' app containing all basic functionalities like login (authentication) and offline storage. Subsequently, we add each set of functionalities in a modular, loosely coupled manner within this canvas app. We organize data around user actions rather than backend systems or technical details. Each functionality integrates the data and actions required for a specific user activity.

Each of the modules can be assembled as needed. If another role requires similar functionality, we simply incorporate the module into their canvas app. If they require different functionality, we create a new module. This new module then becomes available to other roles. **Users only receive the modules they need to avoid clutter and complexity.**

On the backend, all apps for various roles are managed from a single platform. Integrations with backend systems and all business logic are developed once and shared across all apps.

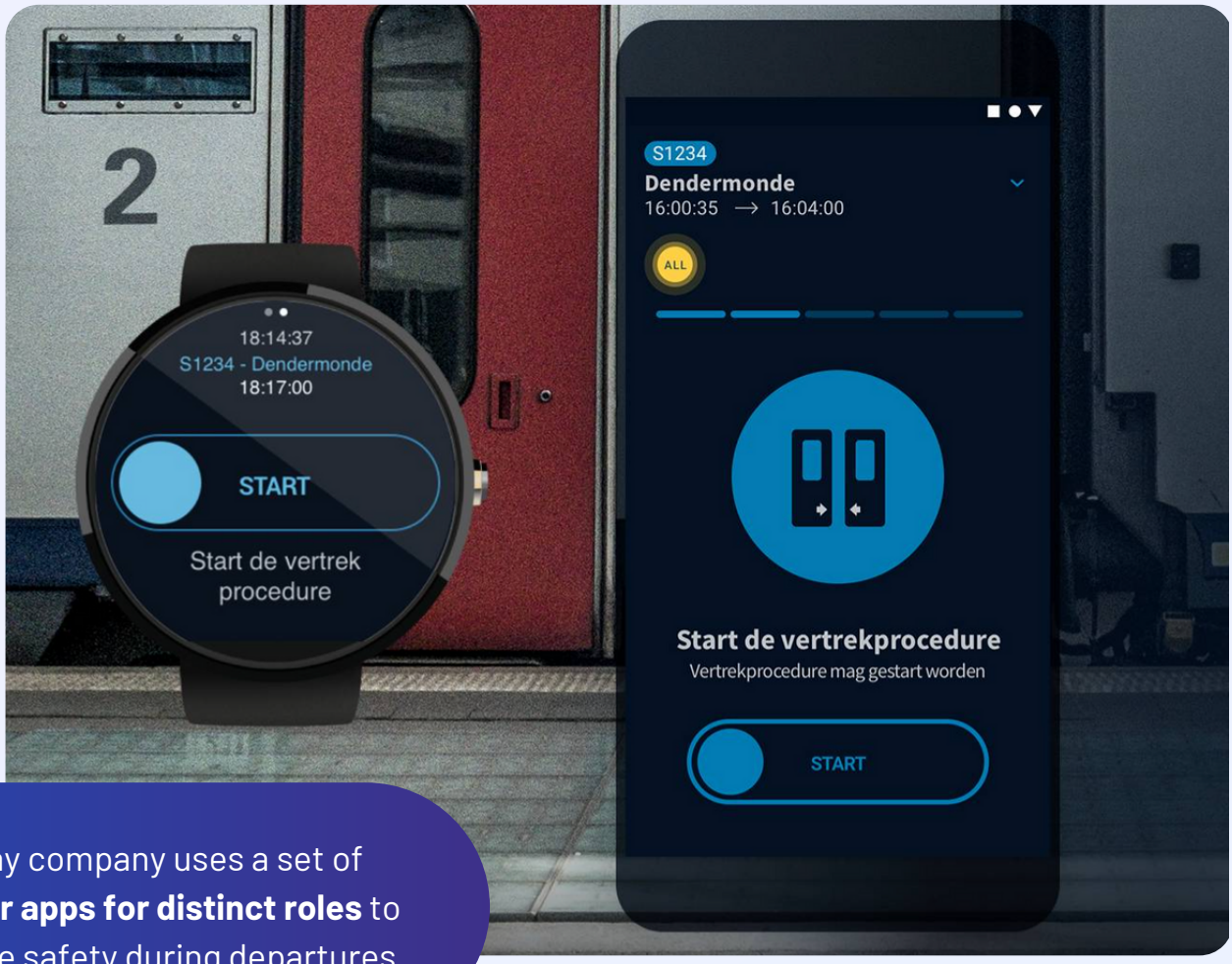


Example

Dedicated app for specific railway roles

A railway company uses a set of modular apps designed for distinct roles like train conductor, station manager, and train driver. While each app incorporates common features such as login, real-time communication, and backend integrations, they also include role-specific functionalities.

Assigning a dedicated app to each role facilitates the digitization of the entire departure process, leading to a notable improvement in efficiency. This digitization reduces delays and enhances safety during departures.



A railway company uses a set of **modular apps for distinct roles** to enhance safety during departures.

2. How composable apps boost productivity and reduce costs

Business information and tools are typically scattered across various applications that are developed for a desk environment. For mobile workers, **retrieving, using and updating this information 'on-the-go' is quite challenging**. In many cases they don't even try and instead they 'prepare their day' in the morning and 'do the paperwork' in the evening.

This challenge often leads to an **inefficient 'offline' approach**, where employees revisit each task three times — preparing in the morning, executing during the day, and administering in the evening. This approach often **results in errors** as users are required to document their daily activities, potentially on paper, and then input this information into the systems during the evening.

Furthermore, the bulk entry of data at the end of the day, may **result in delays** in back-office processing and reporting. In scenarios requiring swift follow-up, such as outages or short-term planning needs, this can be of critical significance.

To address these issues, **providing users with an efficient, user-friendly mobile app** enables them to perform tasks and paperwork simultaneously. This shift results in a notable **productivity increase of 20 to 50%**. How do we know this? Because we can easily measure productivity gains. We **build prototypes in a matter of a few days**, then do some test runs in the field together with actual users. Once the optimal approach is identified, calculating the productivity gain per task and per user becomes a straightforward process.

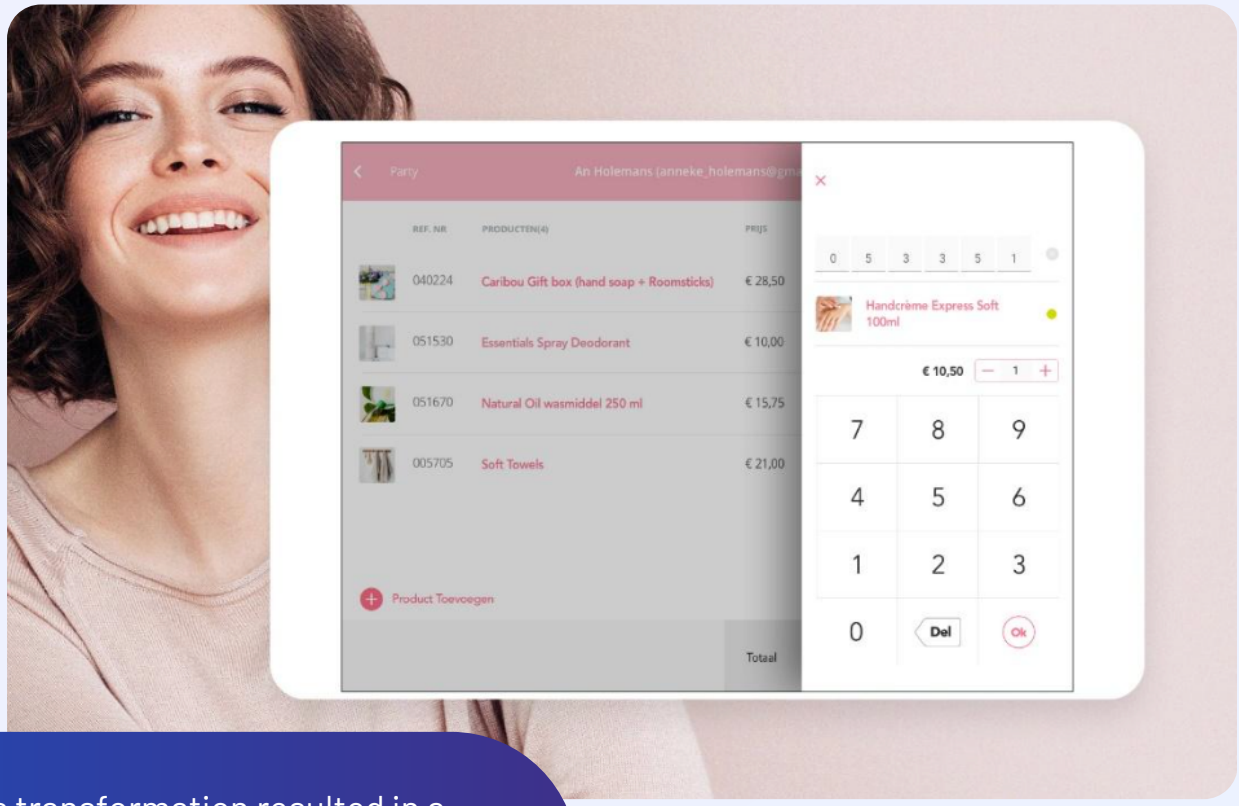
This shift results in a **productivity increase** of **20 to 50%**

Example

Streamlining home party process

A Belgian cosmetics company once faced cumbersome administrative tasks when selling products through home parties. This involved inviting guests, collecting product information, and manually managing orders.

However, with the introduction of a tablet app, the entire home party process is now streamlined, covering digital guest invitations to order handling. This transformation has resulted in a notable 50% reduction in effort and increased operational speed.



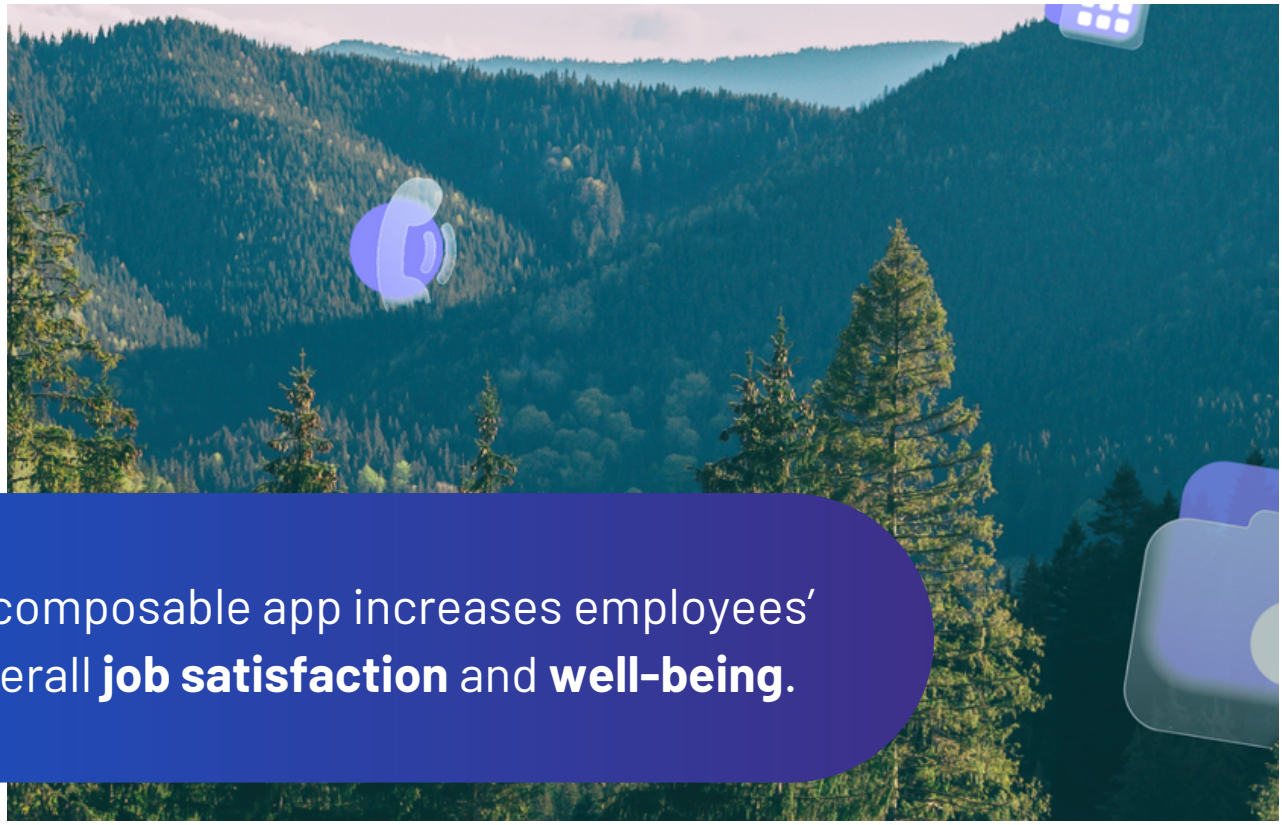
This transformation resulted in a notable **50% reduction in effort** and **increased operational speed**.

3. Human-centric composable apps enhance employee and customer experience

A tailored composable mobile app not only enhances employee productivity but also contributes to overall job satisfaction and well-being. Employees prefer tools that streamline their tasks, and an efficient, user-friendly app tailored to their needs fosters engagement, productivity, and loyalty.

Moreover, a customized mobile app opens avenues for improved communication and information sharing between employees and employers, enhancing the overall employee experience. It's essential to note that, although the tool is valuable, it should never be perceived as controlling, allowing flexibility and personal judgment.

For customer-facing employees, a composable mobile app elevates their working experience, translating into a faster and enhanced customer experience.



A composable app increases employees' overall **job satisfaction** and **well-being**.

4. Integrating mobile capabilities to enhance employee efficiency

Let's explore the additional benefits that mobile technology brings to the work environment, elevating both efficiency and employee experience:

- **Multimedia Integration:** Augmenting actions with photo and video capture directly integrated into records, or utilizing QR codes for swift product or equipment identification.
- **Geospatial Integration:** Capturing location coordinates through GPS and seamlessly incorporating them into the records.
- **Enhanced Planning:** Utilizing GPS routing and driving directions to enhance planning processes.
- **Biometric Authentication**: Leveraging fingerprint technology for user authentication and recording approvals or confirmations.
- **Offline Capability:** Allowing for seamless data usage and updates in areas with no internet connection. Upon reconnection, automatic data synchronization occurs, especially beneficial in buildings, construction sites, or rural areas.
- **Digital Transformation:** Digitizing paper reports and certificates for use on tablets, enabling creation, approval, filing, and sharing during inspections or audits.
- **Interconnectivity:** Enabling the mobile device to connect with other products via Bluetooth, NFC, or Beacons. This facilitates automatic information collection from products into the app and integrates it into the entire workflow and back-end systems.
- **Augmented Reality**: Introducing augmented reality for a heightened level of guidance to employees. This includes presenting additional information, guidance, or instructions overlaid on real-world images.

By incorporating these advanced capabilities, the mobile app seamlessly becomes an integral part of the work itself, rather than just a tool on the side.

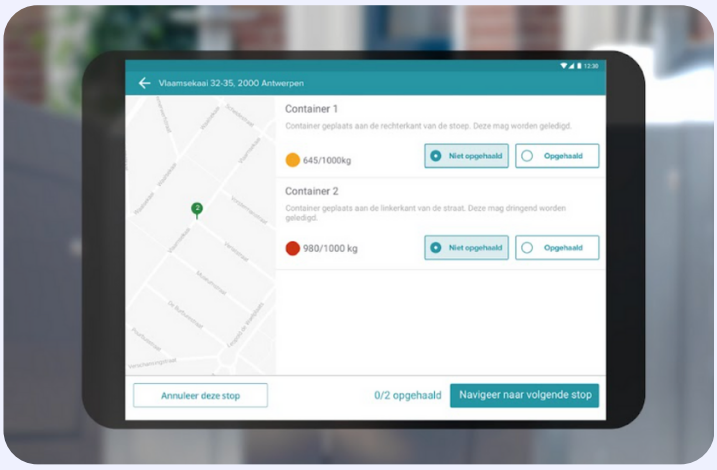
Example

Facilitating car damage inspections

A car fleet service company uses a mobile app to facilitate car damage inspections. The app guides users comprehensively, ensuring meticulous checks and enabling them to enhance car data by including necessary camera images.

Example

Optimizing waste collection routes



A waste management firm uses a mobile app to determine the most efficient waste collection route. The app calculates the optimal path considering container fill levels and locations, guiding the driver along the designated route.

5. Optimizing data efficiency: empowering your workforce with real-time insights

A customized mobile application empowers employees to work with the latest information and contribute real-time updates to backend systems, fostering more accurate insights, enhanced decision-making, alignment between roles, and efficient task execution.

Some examples:

1. **Dynamic Task Tracking:**
Continuous updates on task progress enable prompt actions. For instance, invoicing can start immediately after completing a customer job, optimizing cash flow.

2. **Adaptive Job Planning:**
Real-time updates in job planning, based on actual progress, allow for dynamic adjustments. This flexibility enables teams to accommodate unforeseen tasks, with automatic customer notifications for streamlined communication.

3. **Instant Sales Order Fulfilment:**
Sales order fulfilment initiates as soon as a sales representative enters the order, eliminating delays for quicker and efficient processing.

Enhanced Data Capture

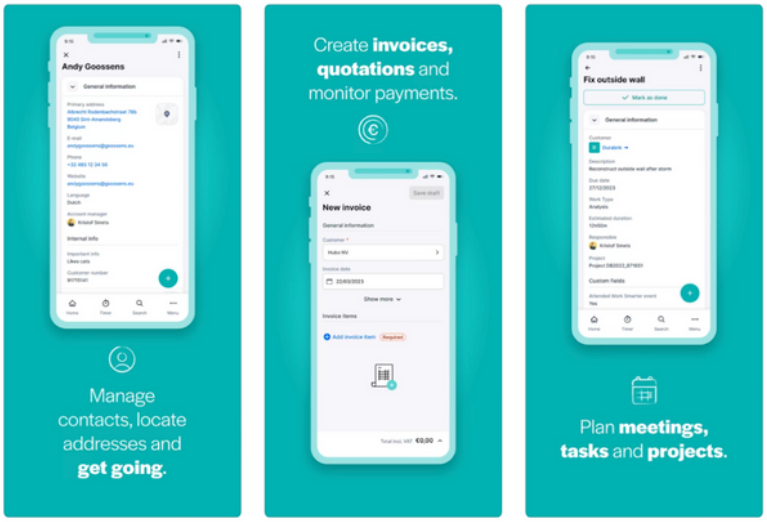
The mobile app facilitates comprehensive data capture beyond traditional tools. The user-friendly interface accommodates detailed information entry, with **automatic addition of contextual data** such as location and time. This enriched dataset supports improved backend reporting, analysis, and decision-making.

User interaction with the mobile app can be monitored to gain additional usage insights in the workflow, the time needed to complete tasks, etc. This data, effortlessly captured during app usage, serves to **optimize workflows and enhance overall planning** without requiring additional user effort.

Example

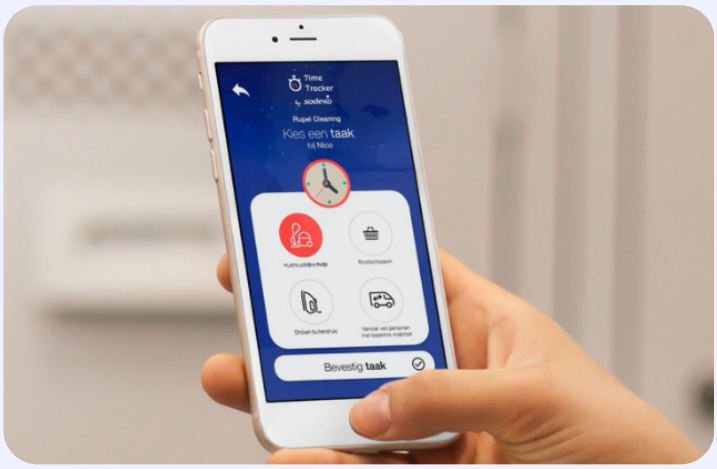
Real-time updates

Teamleader offers cloud based CRM, project and financial management software. The mobile app extends accessibility to these features, enabling employees on-the-go to make real-time updates to CRM and planning.



Example

Time registration for a cleaning service



A cleaning services provider equips its staff with a user-friendly app for time registration. This app expedites the invoicing process for customers, accelerates personnel payments, while reducing workload in the call center.

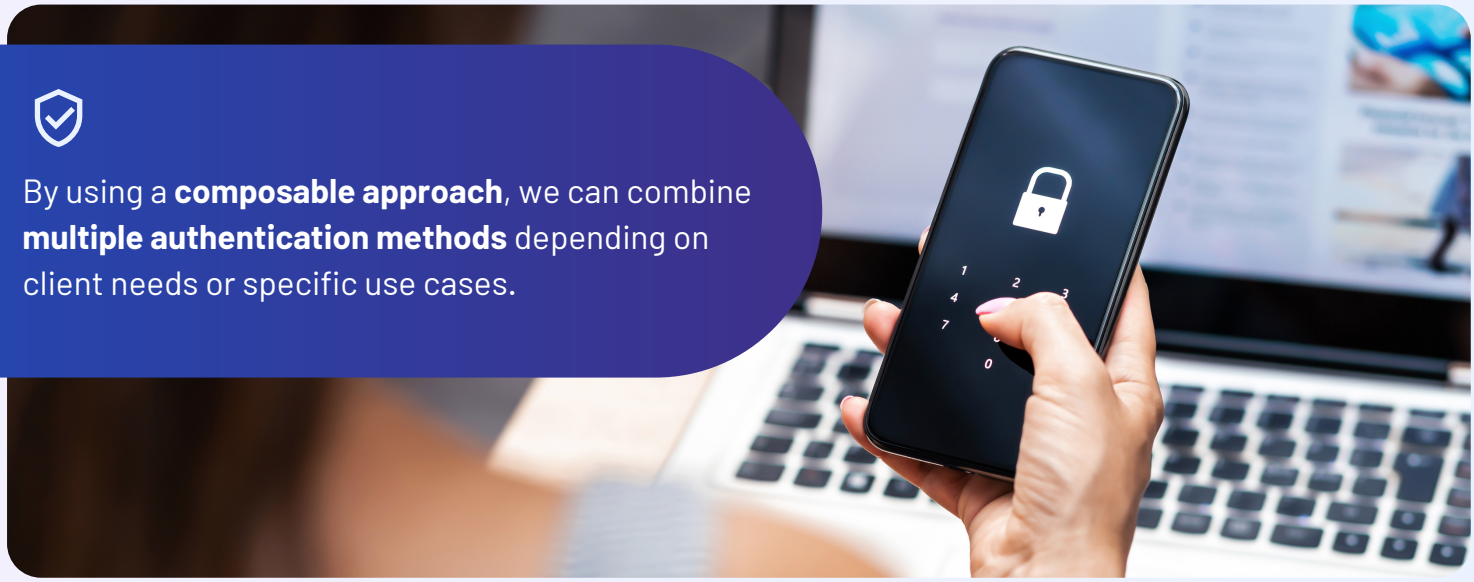
6. Your mobile device as an authentication and security tool

A mobile or wearable device can function as an authentication and security tool, enabling employees to verify their identity and gain access as needed.

Mobile devices provide **various authentication mechanisms including codes, fingerprint scans, and face detection.** When we **combine this with location-aware features such as GPS, wifi and bluetooth beacon detection**, the mobile device becomes a security tool that allows users to identify themselves at specific locations and times.

Use cases range from simple tasks like opening lockers or unlocking printers to more complex scenarios, such as accessing high-security industrial sites.

By using a composable approach when building authentication methods, we can combine multiple authentication methods depending on client needs or specific use cases. Additionally, alternative and fallback mechanisms can be defined, ensuring accessibility even if one authentication method is unavailable due to technical issues or user constraints.



By using a **composable approach**, we can combine **multiple authentication methods** depending on client needs or specific use cases.

Example

Biometric identity verification and location tracking

Belgian workers employed in Luxembourg can benefit from reduced taxes in Luxembourg by demonstrating at least 50 workdays per year in the country. In response, a Belgian tax consultancy firm commissioned us to create an app that utilizes biometric identity verification and GPS location tracking to automatically record a person's work location. Additionally, it enables users to digitally sign the generated report and submit it directly to the tax authorities.

Biometric identity verification and GPS location tracking to automatically record a person's work location.

Digitally sign the generated report and submit it directly to the tax authorities.

7. Navigating the technical landscape of composable applications

Developing a successful composable mobile application demands more than just coding skills. It requires a developer mindset focused on the triad of maintainability, extendability, and code understandability. With a commitment to a clear separation of concerns, the goal is to create an application that not only seamlessly integrates but also remains comprehensible for the developers who will follow in the footsteps of the current architects.

Strategies

There are **two main strategies** to handle composable apps:

1. Employing separate user-specific mobile applications
2. Adopting a role-based approach within a single application

From a technical standpoint both are handled in a similar manner, with the only distinction being the existence of separate entry points in the case of multiple applications.

The application architecture should allow that functionality is loosely coupled, ensuring no direct interaction among different modules. This design allows each module to be accessed based on the user's role.

A user's role is built up as a set of permissions, preventing the application from being locked in by the initial user type definitions. This flexibility allows for seamless adjustments to role permissions, facilitating easy changes in functionality visibility. These technical considerations guarantee the application's adaptability and straightforward integration of new features.

The modular approach

Our philosophy is centered around modularity. Instead of building monolithic mobile applications, we break down our projects into smaller, reusable components known as libraries. **Each library encapsulates a specific domain or functionality within the application.** These libraries define clear contracts or interfaces that the consumer application must adhere to.

This approach stands in contrast to traditional methods, where libraries call API endpoints directly to fetch data. Instead, **our libraries set expectations by defining the necessary data interfaces**. The consumer application, consisting of one or more modules, is then responsible for fulfilling these contracts. Whether the data comes from local sources or remote web calls, **it's the consumer application's duty to ensure the library's requirements are met**.

One of the significant advantages of our modular approach is the ability to **create multiple applications for different user groups**.

Example

Take, for instance, the Belgian Railway Association, which needs tailored apps for train managers and security personnel. While both groups require ticket control features, security personnel don't handle ticket sales like train managers. Using our modular approach, we efficiently build separate applications by integrating relevant libraries. This streamlines updates and expansions, requiring adjustments only in the modular library, saving time, reducing complexity, and enhancing overall project maintainability.

One integration layer

In an ideal situation the mobile applications interact with one backend service - the backend for frontend (BFF) - optimized for the data required in the application. **The BFF aggregates the data** from different backend systems, and performs the required data transformations. Hereby only exposing data to the app and the user to which it should have access.

Using one integration layer tailored to the use cases has many advantages:

- The user's app only has access to data corresponding to the user's role.
- Network traffic is minimized.
- The mobile app is only loosely coupled to the backend systems – i.e. changes in the different systems can be handled without app updates, systems can be replaced, ...
- Data can be delivered in the format expected by the application.

Strategic collaboration for efficient app building

Team members should understand the application's architecture, coding standards, and guidelines for effective collaboration. **Establishing agreements at the team level facilitates development, maintenance, and review by multiple developers**, enabling swift onboarding of new team members.

Our modular approach emphasizes collaboration with domain experts. This partnership helps define necessary libraries, gaining insights into specific module needs. Involving domain experts prevents **unnecessary complexity**, promotes a **clean and maintainable codebase**, and enhances **individual domain testability**, streamlining efficient testing without loading the entire application.

8. Conclusion

Composable apps are **tailored mobile applications designed for distinct roles within an organization**. These apps seamlessly integrate various backend systems, offering **productivity gains ranging from 20 to 50%**.

The modular approach to app development involves creating a 'canvas' app with basic functionalities and adding modular components specific to each role.

Benefits of composable apps include:

- ✓ **Efficiency and Productivity:** Streamlining tasks and paperwork on mobile devices leads to a notable increase in productivity
- ✓ **Human-centric Design**: Tailored apps enhance job satisfaction and employee well-being, fostering engagement, productivity, and loyalty.
- ✓ **Integration of Mobile Capabilities:** Advanced features such as multimedia integration, geospatial functionality, biometric authentication, and offline capability elevate both efficiency and user experience.
- ✓ **Real-time Data Insights:** Empowering employees with real-time data contributes to more accurate decision-making, task execution, and improved planning.
- ✓ **Authentication and Security:** Mobile devices serve as authentication tools, enhancing security through various mechanisms such as codes, fingerprints, and location-aware features.

The modular approach focuses on **building reusable components,** ensuring **clean, testable,** and **maintainable code**. Collaboration with domain experts further enhances development efficiency.

In conclusion, **a modular approach in mobile app development, coupled with close collaboration with domain experts, is essential for creating adaptable, efficient, and user-centric applications**, yielding remarkable results in terms of productivity and customization for diverse user groups.

9. Interested in composable apps to boost your business?

Do you want to enhance your business efficiency and employee and customer experience with composable apps?

As a leading Belgian IT company, **ACA Group** stands as your trusted partner in exploring the vast possibilities of composable applications tailored to your unique business needs. With a proven track record in mobile app development, ACA Group excels in employing the modular approach, ensuring clean, maintainable, and customizable solutions.

With the expertise of our experienced development team and our commitment to perfection, we are the ideal partner for developing composable apps that boost productivity and deliver remarkable results.

Contact our expert for all your questions about composable app development

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