

# App Launch for Customer Processes of a Real Estate Company



Georg Rockel, Linard Barth

**Abstract:** A paperless office is not only environmentally friendly but also advantageous in many aspects. The digitalisation of documents and corresponding processes saves time, reduces mistakes and therefore realizes cost savings for companies. This time can be invested in better customer management. Real estate companies work with thousands of rented apartments and as many customers and thus have to maintain and manage a lot of customer related data. IT has already created manifold remedies with Enterprise-Resource-Planning (ERP) and Customer-Relationship-Management (CRM) systems and models, but there is still plenty of development potential to be exploited by integrating mobile solutions into the IT architecture. The main challenge thereby is not the programming of an app but the seamless integration into customer processes and the creation of customer acceptance and thus value. Therefore, it is investigated how mobile applications can better control customer processes and whether such an implementation is profitable. For this purpose, typical work and customer processes of real estate companies must be analysed, understood and transferred to appropriate mobile solutions. This paper examines the details which need to be considered in such projects.

**Keywords:** App, mobile processes, IT processes, customer processes, apartment rent, utility values analyses.

## I. INTRODUCTION

It is important for a company to consider all its interests and requirements and to develop a comprehensive and long-term IT strategy based on those interests and requirements. This supports the processes required to complete the core process. The global provider market for real estate companies is polarized into the following areas. See the following figure:



Fig. 1. Polarization of the global provider market for real estate companies [1]

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The core process of a real estate company is the rental and management of real estate that is used for residential purposes. The use of software supports the organizational activities of a company, such as the provision of rental-relevant data.

The presentation of the processes and the subsequent documentation of the procedures have the advantage that the weak points can be identified more quickly. In the following, a lifecycle of a rental agreement is first presented and then three original customer processes from the real estate sector are presented, which can be found in the appendix in the form of an organizational chart. This is the typical course of a customer process with all its specifications.

## II. LIFECYCLE OF A RENTAL AGREEMENT

The following figure explains the typical life cycle of a rental agreement in 8 steps:

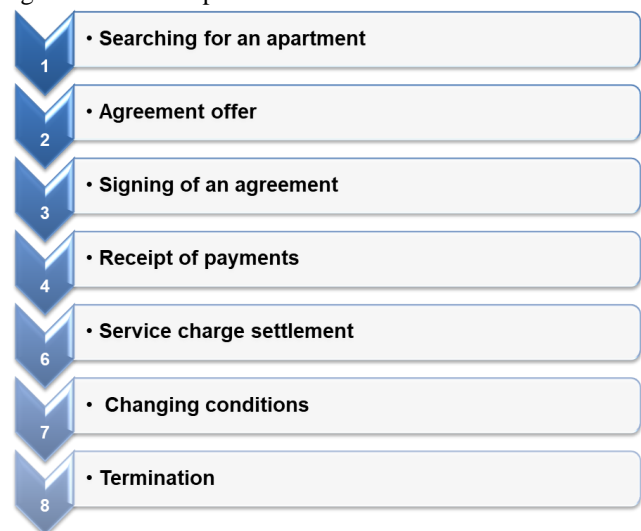


Fig. 2. Life cycle of a rental agreement [2]

First, the system searches for an interested party for the vacant rental object. As soon as an interested party has been found, an offer is made. If the party has agreed to the offer, it is fixed in writing in a rental agreement. The customer moves into the apartment and pays his rent monthly. At the end of each year, a service charge statement is drawn up and the monthly advance payments for operating and heating costs are adjusted. From time to time, depending on the market situation, the conditions are adjusted by the real estate company. At the end of a tenancy agreement's life cycle, there is a notice of termination, which can be given by either party. The customer moves out of the apartment and the cycle starts all over again.

## III. THE ORIGINAL CUSTOMER PROCESS

### A. Process of apartment acceptance

#### i. Receipt of termination notice

After a letter of termination has been received from the real estate company, a note is entered in the ERP program (Enterprise Resource Planning program) [3] program. It is checked whether the form has been complied with, whether a signature has been provided and whether the period of notice has been observed.

If some conditions are not fulfilled, the tenant will be informed of a deficient termination.

If all prerequisites are fulfilled, the rental account is checked, and appropriate information is entered into the system.

During the next two weeks, an appointment will be made for the preliminary inspection of the apartment.

### B. Apartment pre-acceptance

#### i. Preparatory measures

The following documents must be prepared before an employee goes to the apartment inspection:

- A protocol for the preliminary inspection of the apartment,
- documents with details of the individual rooms, how they are equipped and required for the apartment pre-acceptance of the apartments, and
- the rental agreement.

#### ii. Apartment inspection

Before an employee goes to the preliminary inspection of the rented property, he or she must check out of the central office for insurance reasons.

During the apartment pre-acceptance, it is checked whether the condition of the apartment corresponds to the apartment inspection protocol and the documents. The Smartphone serves as an aid for digitizing the documents. All damages and defects are noted in the respective forms.

#### iii. Clarification of the bearing of costs in the event of damage

In the event of damage or any defects, it will be checked whether the tenant is obliged to remedy the situation according to the rental agreement. If this is not the case, the costs of repair or renovation must be borne by the real estate company. If the tenant is contractually obliged to carry out repair work, the tenant will be asked whether he/she agrees to the repair of the damage. If this is not the case, a corresponding note is entered in the apartment pre-acceptance protocol and the tenant is informed of the possible consequences. If the tenant agrees to the repair of the damage, it shall be agreed with the tenant, who will take over the repair of the damage.

In the first variant, the repairs can be carried out by the tenant himself. According to the terms of the contract, the extent to which the repairs must be carried out is determined. After that, a deadline is set for these measures. After the expiry of this period, the final apartment acceptance takes place.

In the second option, the tenant can have the repair work carried out by a third party and bear the costs incurred. In this case, too, the scope of the work to be done is determined.

#### iv. Obtaining of signatures

Once it has been checked whether the company or the tenant bears the cost of the renovation or the damage, the signatures must be obtained in any case, the apartment pre-acceptance protocol and all documents must be signed.

In case the tenant refuses to sign, this refusal will be recorded in the apartment pre-acceptance protocol and, if necessary, a lawyer will be called in. In all cases, the assigned client-advisor must sign both the apartment inspection protocol and all attachments.

#### v. Data maintenance

After all formalities have been completed, the commercial account manager can leave the apartment. When he arrives at the office, he or she must check in personally.

The data taken during the apartment pre-acceptance and the photos taken with the Smartphone must then be transferred to the ERP program.

The original documents are then transferred to the scanning unit, where they are scanned and archived.

### C. Final apartment acceptance

#### i. Preparatory measures

If the granted period for the removal of defects or the period of notice is approaching, a date for the final apartment acceptance is agreed upon.

In the meantime, the following documents must be prepared:

- An apartment handover protocol,
- a final apartment acceptance protocol,
- all documents that have been drawn up during the apartment pre-acceptance,
- the rental agreement,
- the heating costs - meter reading sheet and
- the water and electricity supplier's deregistration form.

#### ii. Apartment inspection

Before an employee drives to the final apartment acceptance of the rented property, he or she must check out of the head office for insurance reasons.

During the final apartment acceptance, it is checked whether all the repairs according to the protocol and documents from the apartment pre-acceptance have been carried out.

If the repair work has not been completed or has only been partially completed and the lessee has agreed to the repair of the damage, a grace period of approximately one week shall be granted. With the Smartphone, photos are taken again, and everything is recorded in the final apartment acceptance protocol.

If the tenant does not agree with the renewed improvement, the final apartment acceptance will be interrupted, and a lawyer will be called in.

If the tenant did not agree with the repair of the damage from the outset and if all the repair work has been properly carried out, all the meters (heating, gas, water, electricity) in the apartment will be read and the meter readings will be entered in the appropriate sheets.

After that, the process goes on with the visit of the cellar, the roof and all other rental objects which are outside the apartment. In case of accessibility of these rental objects, further meters, if any, are read and entered in the corresponding documents.

iii. *Handover of the keys*

The tenant must then hand over all keys to the rental company following the apartment handover protocol. If all keys are complete, they will be checked for usability. If not all the keys are available, this incident will be recorded in the final apartment acceptance protocol and the tenant will be informed of the costs of the re-ordering. All other existing keys are checked for suitability of use.

iv. *Obtaining of signatures*

The signatures must be obtained after the keys have been handed over. The tenant and the customer service representative must sign the final apartment acceptance protocol, the heating cost reading sheet and all other available documents. The copies will be handed over to the old tenant. If the tenant refuses to sign, this refusal will be recorded in the final inspection report and a lawyer may be called in.

v. *Data maintenance*

After all formalities have been completed, the commercial account manager can leave the apartment. When he arrives at the office, he or she must check in personally.

The data taken during the apartment pre-acceptance and the photos taken with the Smartphone must then be transferred to the ERP program.

The original documents are then transferred to the scanning unit, where they are scanned and archived.

## D. Preparing the rental property for subletting

It is checked again whether an external company may have to be commissioned to repair the damage or carry out further repairs. If this is not the case, the apartment is rented out.

If further repairs are due, a cost estimate will be obtained. Depending on the conditions of the contract with the customer, the costs incurred will be deducted from the deposit paid by the former tenant. The former tenant must be informed about this.

Finally, the former tenant must be given a release from rent debt and the data must be checked for completeness in the ERP program.

## E. The process of apartment inspection

i. *Initial situation*

In the following cases an apartment inspection is necessary:

- There is a rent arrears.
- A complaint has been received from the neighbors.
- It concerns a planned apartment inspection, e.g. with reorganization measures or reading of meter readings once in the year.

The rental account is checked to see whether the rental object is rented or not.

ii. *Tenant not available*

If the rented object is not rented, an apartment inspection protocol is drawn up.

Before an employee drives to the final apartment acceptance

of the rented property, he or she must check out of the head office for insurance reasons.

The rental property is checked for defects based on the present protocol and everything is noted in the apartment inspection protocol. If necessary, appropriate photos will be taken.

At the end of the apartment inspection, it is enough for the assigned account manager to sign the apartment inspection protocol.

iii. *Tenant available*

If the rental property is rented, an appointment must first be made either in writing or by telephone.

In the meantime, the following documents must be prepared:

- A protocol for the apartment inspection and
- a protocol for the apartment handover.

Before an employee goes to the final apartment acceptance of the rented property, he or she must check out of the head office for insurance reasons.

The rental property is checked for defects based on the present protocol and everything is noted in the apartment inspection protocol. If necessary, appropriate photos will be taken.

At the end of the apartment inspection, both the account manager and the tenant have to sign the apartment inspection protocol.

If the tenant refuses to sign, this refusal will be recorded in the apartment inspection protocol and, if necessary, a lawyer will be called in. The assigned client-advisor must, in any case, sign the apartment inspection protocol.

## F. Data maintenance

After all formalities have been completed, the commercial account manager can leave the apartment. When he arrives at the office, he or she must check in personally.

The data taken during the apartment inspection and the photos taken with the Smartphone must then be transferred to the ERP program

The original documents are then transferred to the scanning unit, where they are scanned and archived.

The data must then be checked for completeness in the ERP program.

## G. Process of apartment inspection with apartment transfer

i. *Former tenant available*

### Initial situation

The following case constellation exists. The notice of termination has already been received by the real estate company in due time, the apartment pre-acceptance has been completed and the current tenant will find a new tenant for his apartment.

### Preparatory measures

The tenant, the new tenant, and the real estate company agree to the handover of the apartment. The real estate company will adjust the rent amount.

The new tenant must submit the following documents to the real estate company:



- Copy of identity card,
- the last three salary slips and
- a proof of a release from rent debt from of the previous real estate company.

This data must be entered in the ERP program.

### Preparation of the contract

The new tenant can sign the rental agreement personally in the real estate company or the rental agreement will be sent to him by mail.

After the signed tenancy agreement has been received by the real estate company, a date for handing over the apartment is agreed upon.

In the meantime, the following documents must be prepared:

- A protocol for the apartment inspection,
- a service folder,
- the registration form of a water and electricity provider and
- an apartment handover protocol.

### Inspection of the rented apartment

Before an employee drives to the final inspection of the rented property, he or she must check out of the head office for insurance reasons.

During the inspection of the rented object, its condition is examined. All damages are recorded in the protocol for the apartment inspection. It is also determined who must bear the repair costs.

Then all meters (heating, gas, water, electricity) in the apartment are read and the meter readings are entered in the corresponding sheets. Also, all other partial rental objects, which are outside of the flat, are examined. If available, meters are read off and entered in the appropriate documents. Here it is immediately checked whether everything has been cleared away and tidied up.

### Handover of the keys

The tenant must then hand over all keys to the real estate company following the apartment handover protocol. If all keys are complete, they will be checked for usability. If not all the keys are available, this incident will be recorded in the final apartment acceptance protocol and the tenant will be informed of the costs of the re-ordering. All other existing keys are checked for suitability of use.

The keys are then handed over to the new tenant.

### Obtaining of signatures

The signatures must be obtained after the keys have been handed over. The apartment handover protocol, the reading sheets, and all other available documents must be signed by the old tenant, the new tenant, and the assigned account manager. The copies will be handed over to the old tenant. The service folder is handed over to the new tenant with all documents, particularly the copy of the tenancy agreement and the apartment handover protocol.

### Data maintenance

After all formalities have been completed, the commercial account manager can leave the apartment. When he arrives at the office, he or she must check in personally.

The data taken during the apartment pre-acceptance and the photos taken with the Smartphone must then be transferred to the ERP program.

The original documents are then transferred to the scanning

department, where they are scanned and archived.

## **H. Former tenant is not available**

### Initial situation

A search query is sent to the real estate company and the order is processed. In the meantime, the potential tenant must submit the following documents to the real estate company:

- Copy of identity card,
- the last three salary slips and
- a proof of a release from rent debt from of the previous real estate company.

This data must be entered in the ERP program.

### Search for rental objects

After the necessary documents have been received by the real estate company, a suitable rental property is searched for.

If no suitable rental property is available, the interested party will be informed.

If a suitable rental property has been found, an appointment for the apartment inspection will be arranged with the client and an apartment inspection protocol will be drawn up.

### Apartment inspection

Before an employee goes to the preliminary inspection of the rental property, he or she must check out of the head office for insurance reasons.

Upon arrival, the potential tenant is shown the rental property and informed of the rental costs incurred.

In the case the potential tenant is not interested in the apartment, the apartment inspection will be canceled. The client will be asked again regarding his wishes and a new rental object will be chosen for him.

In case the potential tenant is interested in the apartment, the condition of the rented object will be examined. If there are any defects in the apartment, these will be recorded in the apartment inspection protocol. It will be clarified who will bear the costs of the repair. Either the costs shall be borne by the company or the costs shall be borne by the customer. In case the repair or replacement is a substantial betterment of the rental object, the costs may be borne pro rata by both parties or may be compensated with a corresponding increase of the rental price. All agreements made will be recorded in the apartment inspection protocol.

If the customer does not agree with the agreements made, the apartment inspection will be terminated, and a new rental object will be presented to the customer immediately or later. If the customer agrees to the agreements made and agrees to take over the apartment, it will be clarified whether the customer signs the rental agreement personally with the real estate company or whether the rental agreement will be sent to him by post.

### Preparation of the rental object for rental

After all formalities have been completed, the commercial account manager can leave the apartment. When he arrives at the office, he or she must check in personally.

The data recorded during the apartment inspection must then be transferred to the ERP program and the apartment handover protocol and the rental agreement prepared.

It is checked once again whether an external company may have to be commissioned to confirm the damage or carry out further repairs. If further repairs are due, a cost estimate will be obtained, and the corresponding repairs carried out in the apartment.

Once the tenancy agreement has been signed by the tenant, the keys are handed over on the agreed date, which is recorded in the apartment handover protocol.

#### Data maintenance

The data recorded during the apartment handover must then be transferred to the ERP program.

The apartment inspection protocol, the apartment handover protocol, and the rental agreement are then transferred to the scanning department, where they are scanned and archived.

### IV. CUSTOMER PROCESS AFTER IT ADAPTION

#### A. Prior information

In our case, PRO POTSDAM GmbH had already used the ERP program with the module of SAP Real Estate Management (SAP RE Classic) [4].

SAP AG is the market leader for standard business software. The ERP system is based on the SAP NetWeaver application platform. Via SAP NetWeaver Portal, the most important information and applications are brought together centrally in an enterprise portal and are uniformly available to users across all areas [5]. SAP offers a comprehensive software package with comprehensive functionalities that attempts to meet the requirements of companies of different sizes. For this reason, the software must be configured to meet the specific requirements of a company. This is referred to as customizing. But even the manifold functionality does not always correspond to the specific requirements of a company and in these cases, a new or modified functionality has to be developed.

The process was improved by the use of SAP Real Estate Management and the individual adaptation of the software functionality by the SAP development partner PROMOS consult project management, Organization and Service GmbH & Co. KG to the needs of PRO POTSDAM GmbH. Besides, the new "REdesk" functionality was developed. It is a support function for the conversion of all transactions with tenants and interested parties to electronic processing [6].

#### B. Challenges and solutions

The real estate company PRO POTSDAM is a group of companies consisting of the asset-holding holding company ProPotsdam GmbH and several subsidiaries. ProPotsdam GmbH has to deal with 3,000 letters every month and manage around 17,000 apartments. 40 file cabinets have been removed by the use of digital files and the processes are processed faster and more efficiently as all data is recorded in an IT system [7].

The challenges are summarized in the following figure:

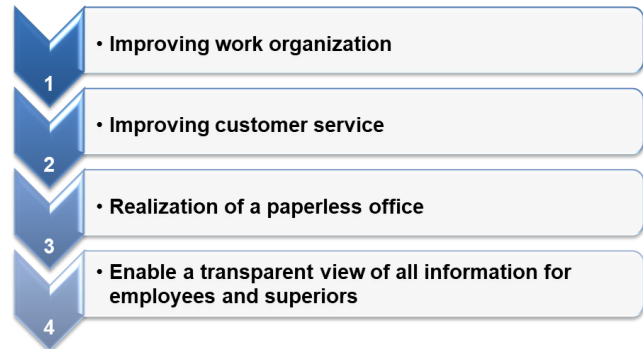


Fig. 3. Challenges before process improvement [8]

The solutions are summarized in the following figure:

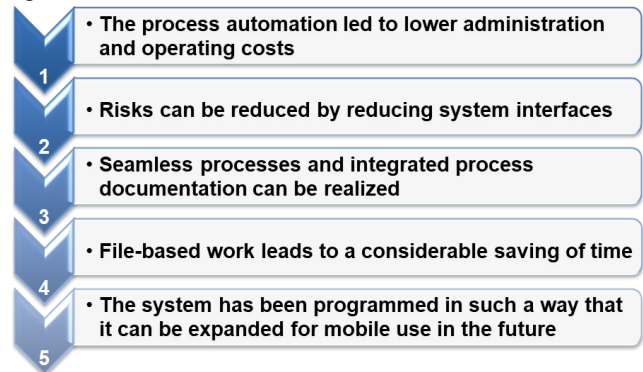


Fig. 4. Solution proposal [9]

#### C. Release change

SAP RE-FX stands for flexible real estate management and replaces the old SAP RE Classic [10]. It is SAP's current solution for real estate management in the sense of a holistic view and maps all associated business transactions, such as portfolio, contract or space management. It is also possible to graphically map building drawings using AutoCAD [11]. PRO POTSDAM GmbH is about to change the module from SAP RE Classic to SAP RE-FX soon. Due to the effort involved, implementing an improved ERP version is very complex and must therefore be carefully planned.

### V. CUSTOMER PROCESS AFTER THE INTRODUCTION OF THE MOBILE APP

#### A. Apps definition

In a broader sense, the term "App" refers to any form of application program, it is an abbreviation for application.

In a narrower sense, an app is an application for a smartphone. Smartphones function like computers and have a touchscreen display. A computer cannot function without an operating system, the same applies to apps. An operating system is installed on every smartphone and an app must be reprogrammed for every operating system.

This trend was triggered by Apple's iPhone, with the opening of App Stores in July 2008. The apps themselves can be downloaded directly to a smartphone in a virtual marketplace, several marketplaces are depending on the operating system of the smartphone.

## App Launch for Customer Processes of a Real Estate Company

Most of the apps are even available to users free of charge. The applications range from small computer games to practical utilities to the improvement of business processes. The Mobile Business App is explained in the following figure:

<p><b>The term "Mobile Business App" refers to the integration and use of mobile end devices in the operational IT and process landscape. Furthermore, the following distinctions are made</b></p>	
<p><b>Mobile Customer App</b> describes "any mobile communication and interaction based on mobile devices with the end customer".</p>	<p><b>Mobile Enterprise App</b> describes a "purpose of process simplification and the transfer of internal processes to mobile devices".</p>

Fig. 5. Definition of Mobile Business App [12]

### B. App market

In the beginning, the app was a niche market that became a mass phenomenon in a short time. Since 2009 with sales of € 0.02 billion until 2019 with a forecast of € 1.66 billion, the German app market has experienced rapid growth. This corresponds to an increase of 8200%. This development is shown graphically in the following figure:

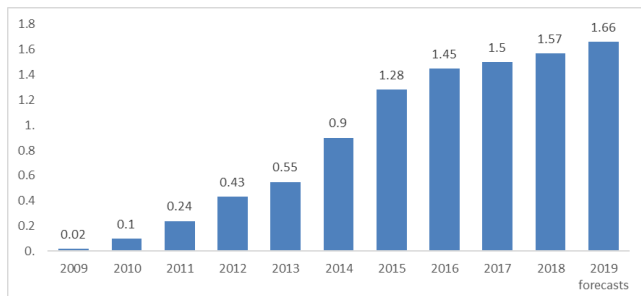


Fig. 6. Revenues of mobile apps in Germany (in billion Euros) [13]

According to preliminary statistics, 205.4 billion apps were downloaded worldwide in 2018, an increase of 15.3% compared to 178.1 billion apps downloaded in 2017. Sales in 2018 were 365.2 billion dollars, compared to sales in 2017 of 285.3 billion dollars, an increase of 28%. In 2022, an increase in app downloads of 258.2 billion and a turnover of 808.7 billion dollars is expected. This corresponds to an increase from 2018 to 2022 of 25.7% in downloads and 121% in sales. This can be seen in the following figure:

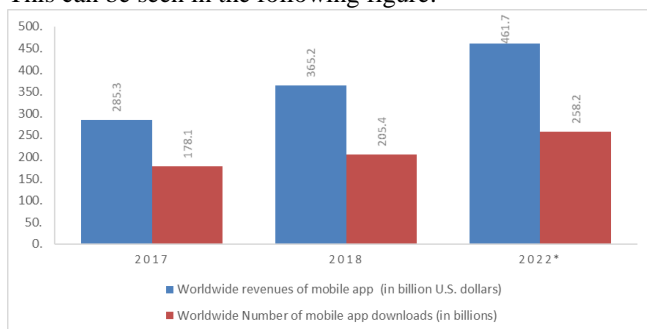


Fig. 7. Worldwide downloads and revenues of mobile app [14]

### C. Reasons for investing in apps

#### i. Criteria for the development of apps

The following criteria must be considered when developing a business app, as seen in the following figure:

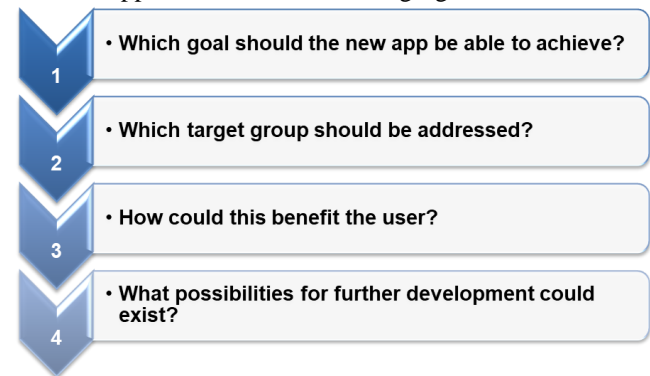


Fig. 8. Criteria for the development of business apps [15]

Furthermore, it must be noted that an app must be developed separately for each operating system and this drives up costs.

#### ii. Investment reasons from the developers' point of view

The developers have recognized the trend in mobile applications and are investing in the development of mobile applications. One of the most important reasons given by the companies in a BITKOM survey was the expansion of their product portfolio. This in turn results in further benefits, such as an increase in customer loyalty, the improvement of customer service and opportunities to win new customers. Other reasons cited are cost reduction, image cultivation, the development of new business fields and the improvement of business processes. The motives from the view of the developers were represented in the following figure:

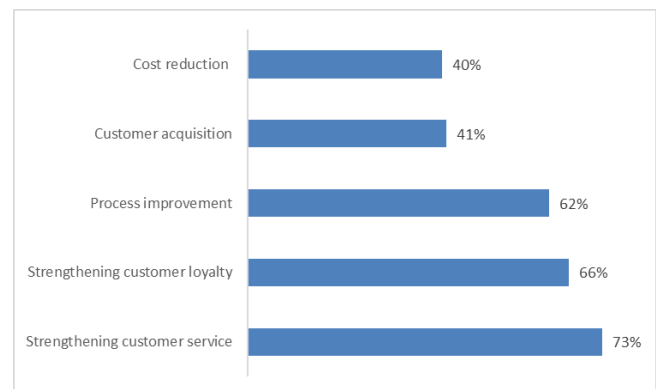


Fig. 9. Investment reasons in apps from the developer's point of view [16]

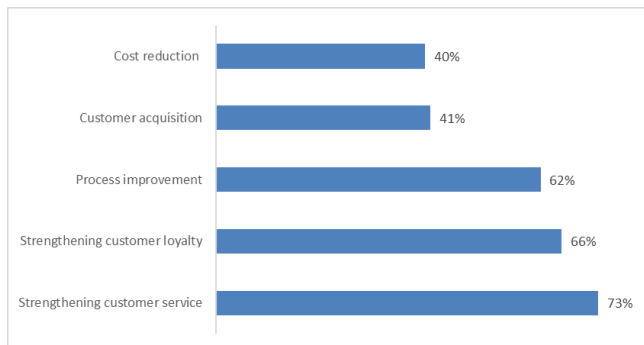
#### iii. Investment reasons from the users' point of view

The users expect that by investing in mobile applications, improved customer service can be offered, and it is hoped that this will result in higher customer loyalty. So, no matter if from the developer's or the user's point of view, the customer is in the foreground when using mobile applications. Another important reason is the improvement of business processes. Here, too, the opportunity to win new customers with a successful investment is seen.



Furthermore, the image plays a role, one would like to present oneself as a modern enterprise.

Through an efficient and fast exchange of information, companies hope to gain a competitive advantage. The motives from the view of the users were represented in the following figure:



**Fig. 10. Investment reasons in apps from the user's point of view [17]**

#### D. Customer process with the mobile app

##### i. Developer

PROMOS consult has recognized the well-known weak point between the company and the field service and has developed a new mobile application for the real estate industry. It is a new IT platform for process-oriented work. It enables access to data in the ERP system using high-end devices such as smartphones, iPads or tablet PCs. Data can be entered, changed or deleted outside the company, allowing complete business processes to be processed via a common interface with clear symbol language. It is a professional app for real estate managers, real estate administrations, apartment owners, property managers, caretakers, and facility managers [18]. With the app for SAP NetWeaver, the processes of the central organization in the ERP system can be structured and external customers and suppliers can be integrated into their processes in the internet portal to increase efficiency. The app makes business processes mobile and offers the necessary flexibility for customer-specific intelligent forms [19].

##### ii. Form types

The so-called standard forms as well as their paper equivalents are available as blank forms and can be filled out and sent on the mobile device. This triggers a business process on the mobile device. An example of an application case is the damage report. During a tour, the caretaker discovers a claim, records it with the mobile device on-site, and sends the completed claim form to the server, which can then automatically process the incoming claim form.

In process forms, a leading ERP system writes process-specific data to a form and stores it in a mailbox. The form is already prefilled. A typical application is the apartment takeover. The form is already filled out with the address, the date, the name of the tenant and the corresponding equipment characteristics of the object. In online mode, the app has access to the mailbox and loads the form into the inbox so that it can be filled out further on the mobile device during the handover date.

##### iii. Properties

The basic principle of the form service app is most comparable to an e-mail program. Forms are received, processed and sent instead of e-mails. The structure of the mailboxes for the form of service can be customized on the server.

Numerous sophisticated functions are available in the app:

- The built-in camera can be used for photo documentation directly in the form. Stored photos can be accessed from the form.
- Signatures can be entered directly by adding time and optionally also under the geographical data. The use of a special pen is recommended.
- Hand sketches can also be correspondingly inserted into the form.
- The incoming forms can be sorted by distance. Position and route can be displayed directly in the app and by linking to the map app.
- The app can use the geo-localization function to store this information in the form, e.g. in the signature.
- The forms can be converted to PDF and sent e.g. by e-mail.
- The app has an online and an offline mode. The comparison with the server only takes place online. The loaded forms can also be edited offline, e.g. in the basement.
- Individual areas in the form can be duplicated in sections. When entering a message, any number of damages can be entered in one message.
- Individual fields in the form can be stored with catalogs, also hierarchically. The catalogues can be assigned user-specifically on the server side.
- The folder structure on the server can be adapted to the specific needs of the company.
- Several user profiles can be stored in the app. This is practical when several employees share a mobile device.

The user should be supported in the work that is still to be done. Different document lists (e.g. notification lists, order lists, charge transfer lists, etc.) are available for this purpose. The tasks can be processed by several employees together. The tasks can be grouped according to their priorities. Tasks are stored in a central location, supported by the system. The app enables mobile access to all business information anytime, anywhere and securely.

##### iv. Analyses areas

Currently, 10 areas of analysis are planned:

- 1) Basic data - object hierarchy, rental space, rent per square meter ( $m^2$ ), type of use, current use, number of rooms, floor, year of construction, equipment and type of building.
- 2) Vacancy - number of tenant changes by period, vacancy reason and vacant in % by duration.
- 3) Receivables management - rent arrears in euros in the last 12 months, current tenant balance, number of reminders and legal transactions in the last 12 months and reminder blocks.
- 4) Rental success - duration of vacancy until new letting, repair costs per  $m^2$  during the vacancy, number of visits and number of applicants.

- 5) Operating cost benchmarking - heating costs per m<sup>2</sup>, hot water costs per m<sup>2</sup>, costs per cost type per m<sup>2</sup>, previous year's comparative values per m<sup>2</sup>, heat metering service, consumption cost share, distribution key, and energy type.
- 6) Balance of operating costs - recoveries in euro per m<sup>2</sup>, payments in euro per m<sup>2</sup>, balance, comparison with previous year's figures and advance payments.
- 7) Rent adjustments - rent increases in the last 12 months, the difference between basic rent and rent index prices per m<sup>2</sup> and the difference between basic rent and local real estate rent per m<sup>2</sup>.
- 8) Maintenance - maintenance costs per trade and m<sup>2</sup> in the last 12 months, the difference from the previous year, budget consumption and forecast values.
- 9) Social statistics - nationality, age, number of children, income group and occupation.
- 10) Process quality - operating cost accounting progress, workflow statistics, and tenant notifications.

## VI. PROFITABILITY ANALYSIS OF THE APP INTRODUCTION

### A. Basic principles

As early as 1929, Erich Gutenberg concluded within the framework of his economic theory that economic efficiency was based on whether "a certain operational performance could be achieved with the least possible use of resources (factor input quantities) or with given resources the best possible performance" [20]. Consequently, we are talking about a purely formal minimum or maximum principle. If the attainable income is higher than the expenses to be produced, then the investment is economical and, in this sense, also profitable.

However, it is difficult to determine the profitability of IT investments, a quantitative assessment is hardly possible from the outset [21]. For this reason and the reason that there are no more precise figures available for the introduction of the business app since the project is in a development phase and was already planned in the pre-investment "digital dossier", the following attempts carry out a utility value analysis to determine the profitability.

Christof Zangemeister defines the utility value analysis as follows. "Utility value analysis is an analysis of a set of complex action alternatives with the purpose to arrange the elements of this set according to the preferences of the decision-maker regarding a multidimensional target system. The illustration of this order takes place by the indication of the utilizable values (total values) of the alternatives" [22].

According to the definition, first, the values of use important for ProPotsdam GmbH must be established. They are based on the following three perspectives.

- The organization's perspective includes data maintenance and the time and costs involved. A good organization can contribute to the improvement of processes.
- The perspective of customer relations includes the exchange of information, service, flexibility, and mobility.
- The security perspective includes the clarity of data and processes, which in turn contribute to traffic security,

as well as the security of IT.

The utility values are shown in the following figure:



Fig. 11. Value of use perspectives

"Efficiency gains are not directly "cash effective" and therefore do not result in a change in cash flows" [23]. "Increases in productivity are the source of sustainable improvements in a company's competitiveness. They should, therefore, be weighted higher" [24].

First, a comparison of the current state with the state after the introduction of the app is made, without weighting factor, which can be taken from the following figure:

Evaluation criteria	Current state	Condition after App introduction
Data maintenance effort	very high	low
Time management	unvarying	unvarying
Cost reduction	limited possible	possible
Process improvement	no	yes
Exchange of information	medium	high
Service	unvarying	unvarying
Flexibility	medium	high
Mobility	medium	high
Clearness	sufficient	satisfactorily
Traffic safety	satisfactorily	good
Safety and security	high	low

Fig. 12. Comparison of the utility values without weighting factor

### B. Calculation of the utility values

To make a more objective comparison, a comparison of the utility values using a weighting factor is undertaken below. The evaluation is subject to a point evaluation procedure. The analysis is carried out quantitatively based on the preferences already defined above using the utility values, thus parameterizing the variants and comparing the totals. First, a weighting factor was assigned to the individual evaluation criteria.



A weighting factor was then assigned to each variant with the corresponding evaluation criterion. A partial utility value was calculated by multiplying the weighting factor by the valuation factor. The sum of the partial utility value results in a total utility value for each variant. The following table shows the calculation of the total utility values for the two variants which can be seen from the following figure:

Evaluation criteria	W	Current state		Condition after App introduction	
		V	VxW	V	VxW
Data maintenance effort	0,07	3	0,21	5	0,35
Time management	0,05	3	0,15	3	0,15
Cost reduction	0,15	3	0,45	4	0,60
process improvment	0,09	3	0,27	4	0,36
Exchange of information	0,02	2	0,04	3	0,06
Service	0,05	3	0,15	3	0,15
Flexibility	0,13	3	0,39	4	0,52
Mobility	0,13	3	0,39	4	0,52
Clearness	0,02	2	0,04	3	0,06
Traffic safety	0,15	3	0,45	4	0,60
Safety and security	0,14	4	0,56	1	0,14
Total utility values	1,00		3,10		3,51
W= Weighting factor		V = Valuation factor			

Fig. 13. Comparison of the utility values with weighting factor

## VII. RESULTS

After comparing the total utility values, the following sequence results for the variants. The current state has achieved a total utility value of 3.10 and the state after the introduction of an app has achieved a total utility value of 3.51. After this calculation, the alternative action of introducing an app is more advantageous for the decision-maker. With the help of the utility value analysis, a comparison between the alternatives could be made possible. The real estate management causes considerable expense under consideration of different framework conditions. Simultaneous integration of all information into an IT system requires a high degree of flexibility. The use of apps enables the continuous processing of business processes via a single interface, simplified control and monitoring of these processes and efficient design of administrative processes.

## VIII. CONCLUSION

With the rise of globalization, competition has also become increasingly fierce. Increasing competition reduces the profit margin of individual companies. To be able to generate further profits, these companies must now concentrate on

their core competencies.

The introduction of the Internet and improvements in information processing have made it easier for companies to bring information about their products closer to their customers. These technical innovations have led to increased market transparency, but competitive pressure has also increased.

This link between the development and use of new technologies, the facilitation of information processing, the ever-increasing competitive pressure and the search for ever-new solutions with the help of technologies is leading to a downward spiral and an ever-increasing pace of change.

The changes in the customer process are triggered by IT innovations. Most companies see IT as a support for business processes and a lever to increase efficiency.

Mobile CRM solutions (Customer Relationship Management) are very useful for sales representatives, so they have access to daily updated and always available information. Employees can react quickly, and the quality of the data improves. They are easier to reach, flexible and have access to internal company data from any location.

In this way, the customer is placed at the center of entrepreneurial trading and the company can better orient itself to the needs of its customers and thus strengthen customer loyalty and win new customers.

The time can thus be saved, the data is recorded only once and in real-time in the entire system and can be immediately transferred to other areas.

The ability to have immediate access to all data saves time. And time savings mean cost savings. The company benefits from improved information quality and can, therefore, react more quickly to changing customer expectations.

The success of an app in the business sector depends on the simplicity of its operation, its costs, and the benefits for the user. Besides, the functionality of the end devices and the fees for mobile data transmission play an important role. Falling costs for mobile data transmission will continue the trend towards the use of apps. This will provide a low-cost product for a company that can help streamline and accelerate business processes.

The developments in the IT industry described above and the changes in market segments indicate a trend towards the global networking of companies. In the future, a company will be incapable of acting without them. The enlargement of the networks leads to a reorganization of the tasks and thus to a change of the existing infrastructure. The processes are closely focused and constantly changing. This process will continue until there are also new business solutions in the area of IT innovations. Thus, new forms of provision, classification, and use of information will emerge again and again. Today, not only the services offered, but also the form in which they are offered must be up-to-date and meet the expectations of customers.

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