

Embracing a Smart World.



VONOVIA

Capital Markets Day 2019



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Digitalization – Technical Property Management

1. Intro

2. Digitalization| Technical Property Management

3. Plan

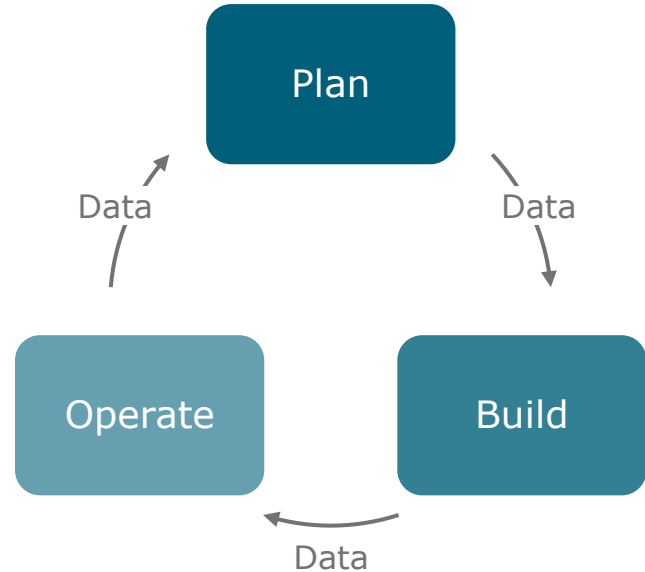
4. Build

5. Operate

Objectives & challenges

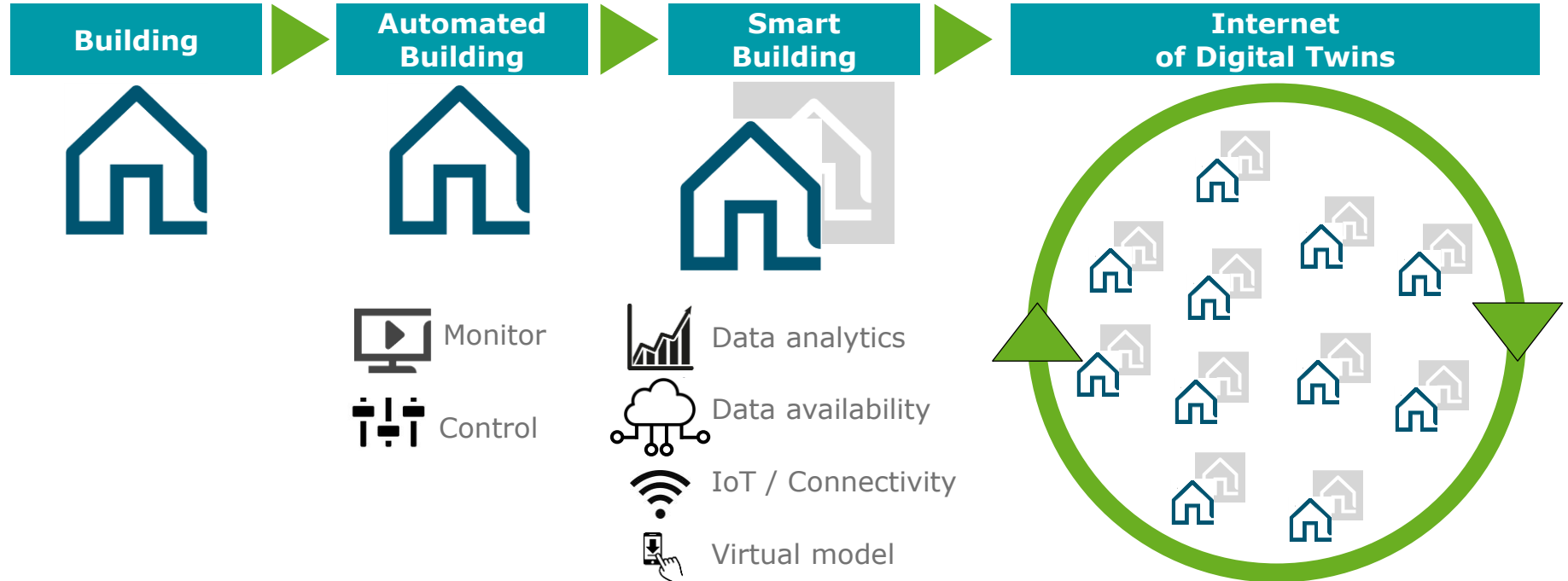
- Key challenges to the resi market:
 - Building sufficient amount of new apartments
 - Reduction in construction times
- Long-term goal: digital record of entire building lifecycle (Plan – Build – Operate).
 - Make maintenance and refurbishment processes as lean and efficient as possible.
 - Move from reactive into a proactive maintenance mode.
 - Data based planning, building and operating models.
- Benefit – improvements in:
 - ✓ Cost
 - ✓ Time
 - ✓ Quality

Building Lifecycle



Technical Property Management Vision

> Buildings will transform to autonomous, smart organisms



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Digitalization | Technical Property Management

Building Lifecycle Plan – Build – Operate



	Plan	Build	Operate
Today/ Pilot	<ul style="list-style-type: none"> Stand alone BIM processes Digital planning within Vonovia and handover of digital model to general contractor and manufacturer of modules 	<ul style="list-style-type: none"> Use of digital tools in monitoring of construction site (progress) and documentation of construction defects 	<ul style="list-style-type: none"> Digital monitoring of technical facilities & equipment Primarily: Elevators and heating systems
Vision	<ul style="list-style-type: none"> Full-scale 5D building plan incl. clash detection, cost & budget planning and submission process Seamless interfaces and elimination of media disruption 	<ul style="list-style-type: none"> Comprehensive digital construction site documentation based on "7D building plan" 	<ul style="list-style-type: none"> Use of "as-built" models in full operational mode to replicate platform model and digital organization of maintenance and logistics processes



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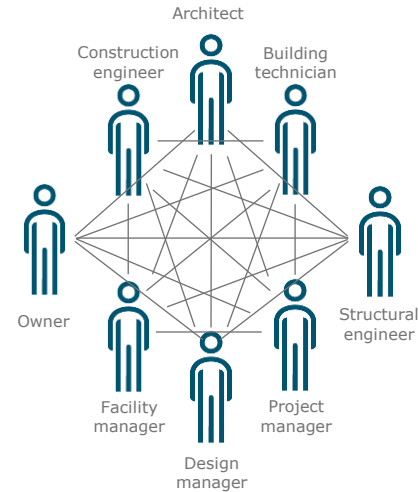
Plan

Current Situation

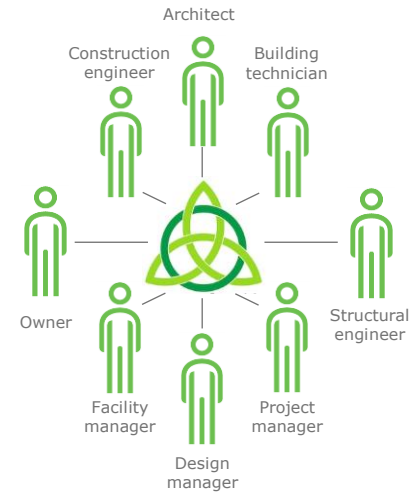
- Digital in-house planning of new constructions within Vonovia through use of BIM tools and processes.
- Handover of digital building models to general contractor / manufacturer for realization.

Benefits

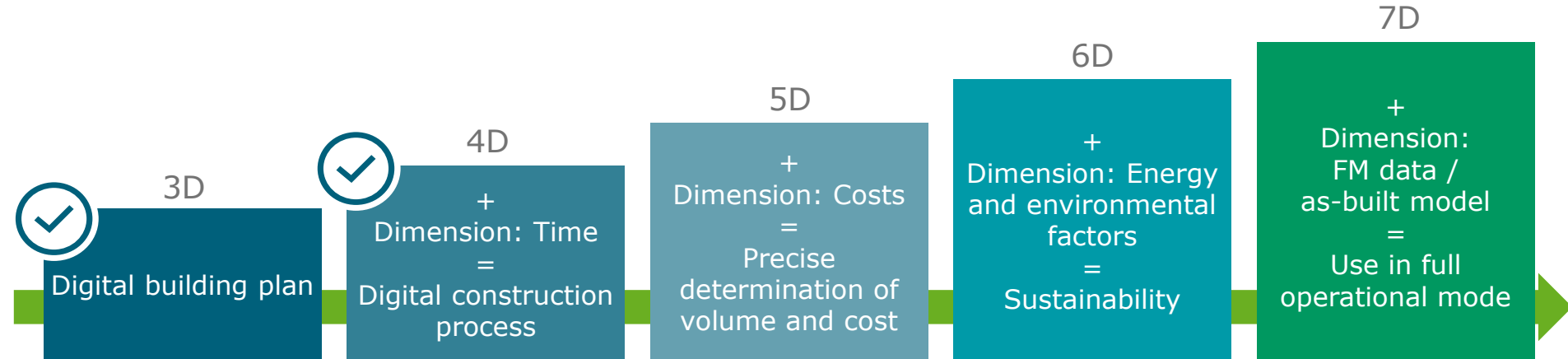
- Higher degree of internal value creation.
- Standardized floor plans and building data.
- Improved communication and automatic documentation of current state and progress .
- Efficient design of (rent-generating) floor space.
- Facilitation of cooperation with general contractors.
- Reduction of errors and redundancies in plan & build processes.



Traditional information flow



IFC/BIM project organization

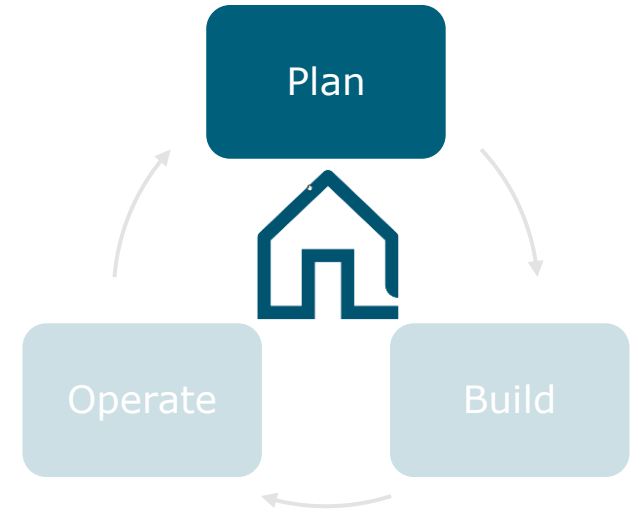


- End-to-end digital planning process involving all relevant parties, to increase quality and speed in the construction process and to be better able to deliver on any warranty issues and/or follow-up work.
- Expansion of current planning dimensions by implementing additional BIM tools and linking parties involved.
- Standardization in the planning process:
Vonovia product catalogue for material and building specifications to standardize and simplify future maintenance processes.

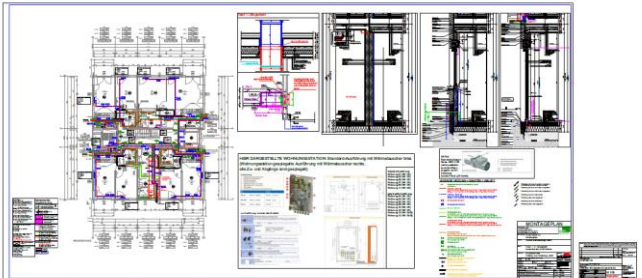
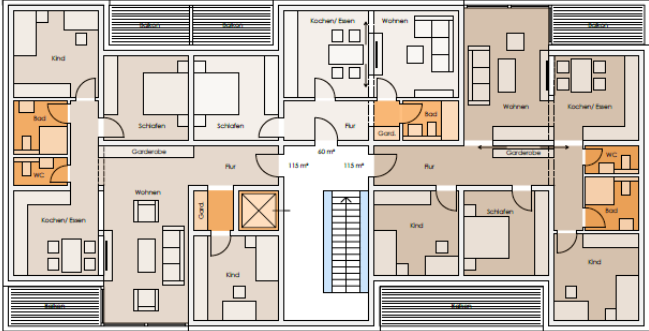
Output of “Plan” Phase

Planning model with static data on technical building information

- › Floor plan
- › Data on technical building information
- › Doors
- › Heating system
- › Elevator
- › Materials (sanitary installations, etc.)
- › ...



Plan Data



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Build

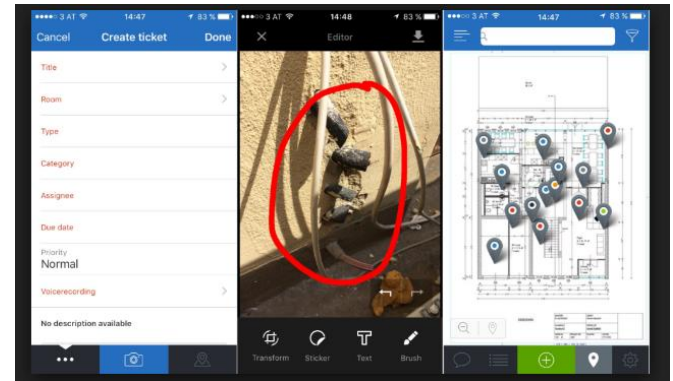
Current Situation

Optimization of construction processes at the construction site

- Digital management of warranty management and follow-up work.
- Structured process of defect work and warranty management on the basis of 2D planning.
- Pilots underway to further structure remedy of defects
 - Digital recording of defects and assignment to responsible (sub) contractor.

Benefits

- Efficient follow-up to warranty issues.
- Improved construction quality.
- Digital quality management and documentation.
- Can also be used when only lower-quality building plans (2D) available.



Build Vision

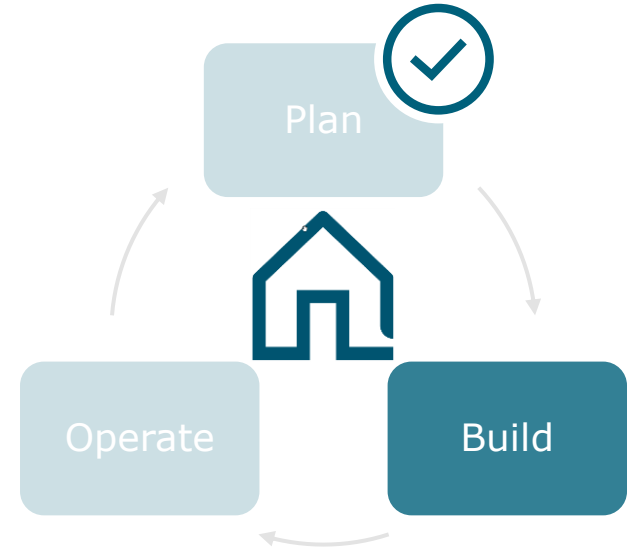
- Use the data of BIM models for digital construction site management
- Information and data are collected throughout the entire construction process to develop “**as-built**” model for use in full operational mode
 - **Seamless communication** among all involved parties
 - **Optimized project cost** controlling
 - **Tracking** of construction and layout changes
 - **Tracking** of defects
 - **Transparent and trackable** management of tasks
 - **Commissioning** information
 - **Tracking and documentation** of Warranty Management
 - **Documentation** of operator obligations and regulations
 - **Documentation** of facility management



Output “Build” Phase

Model with progressive data input

- › Construction progress/documentation
- › Variance analysis plan vs. actual
- › Documentation of defects
- › Materials “as built”



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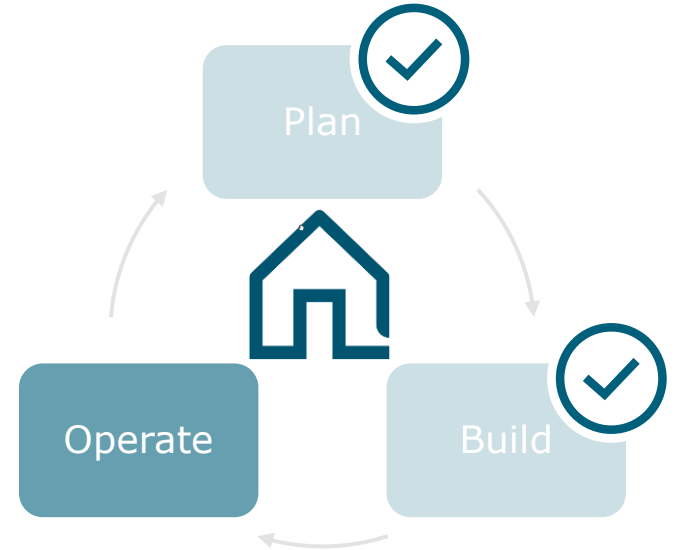
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From plan to digital twin

- › Technical installations / facilities:
monitor, analysis and action
- › Automated FM processes

= **data-driven property management**



Challenges

- **Insufficient transparency** and up to date information regarding performance of technical equipment
- Any default or **malfunctioning** technical equipment such as elevator or heating system leads to **dissatisfied customers** and high strain on internal process
- Highly reactive mode – usually a **customer triggered contact** reports the defect
- This **reactive mode** puts Vonovia in the defense trying to minimize overall burden on both the customer and the organization

➔ Following the customer-initiated contact, Vonovia fixes any problems as quickly as possible.
Limitations to report back to customer exist.

Operate

Vision (Pilot Phase)

Development of a platform for the digital monitoring of systems and building technology

Benefits

- **Increased customer satisfaction** through early detection of malfunctions
 - **Improved coordination** of service providers and craftsmen through review and documentation of work completed
 - **Reduction of process costs** in-house through information-based decision making
 - **Direct interaction** with customer through portal or mobile app
 - **Better informed** field force
- ➔ Current focus: **heating systems and elevators**

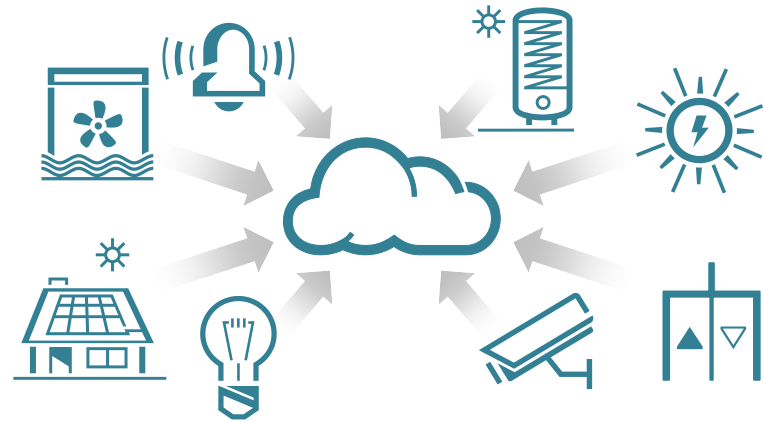


Video and Live Platform Demo



1. Use of dynamic data

- Set up processes on the basis of digital platform information
- Adding additional technical systems
- Implementation of predictive maintenance
- Development of data-driven business models as future prospects



2. Use of static data

- Optimize logistics and maintenance processes by using digital building twin
- Example: Elimination of multiple trips to customer / work site as the digital building twin holds all the information as to what material needs to be used

Core Benefits

- Higher **customer satisfaction**.
- Continuous **performance tracking** of external service partners.
- Optimize **processes** and operative **KPIs**.
- Transform reactive service programs into **proactive service programs**.

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