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simple. asset. management.

About EineStadt GbR

- Founded in September 2015 in Augsburg
- 2016: Development of the software and Chip testing
- 2017: Field test at Schwabmuenchen (Bavaria) and reaching readiness for market

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Developer

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Business Manager

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How did the idea come about?

Internal workers mentioned they often have the problem to properly **correlating the real-world object** (especially in object groups) to the GIS dataset.

Further criticism to external service providers

- Do not use the same program/data
- Do not report the completion of tasks
- Boondoggling ☺

General problem for **residents to report problems**

- Telephone call (opening hours)
- In person (dito)
- Usage of different reporting websites

→ **Information often gets lost between the different parties**
→ **Technological difficulty of data exchange**

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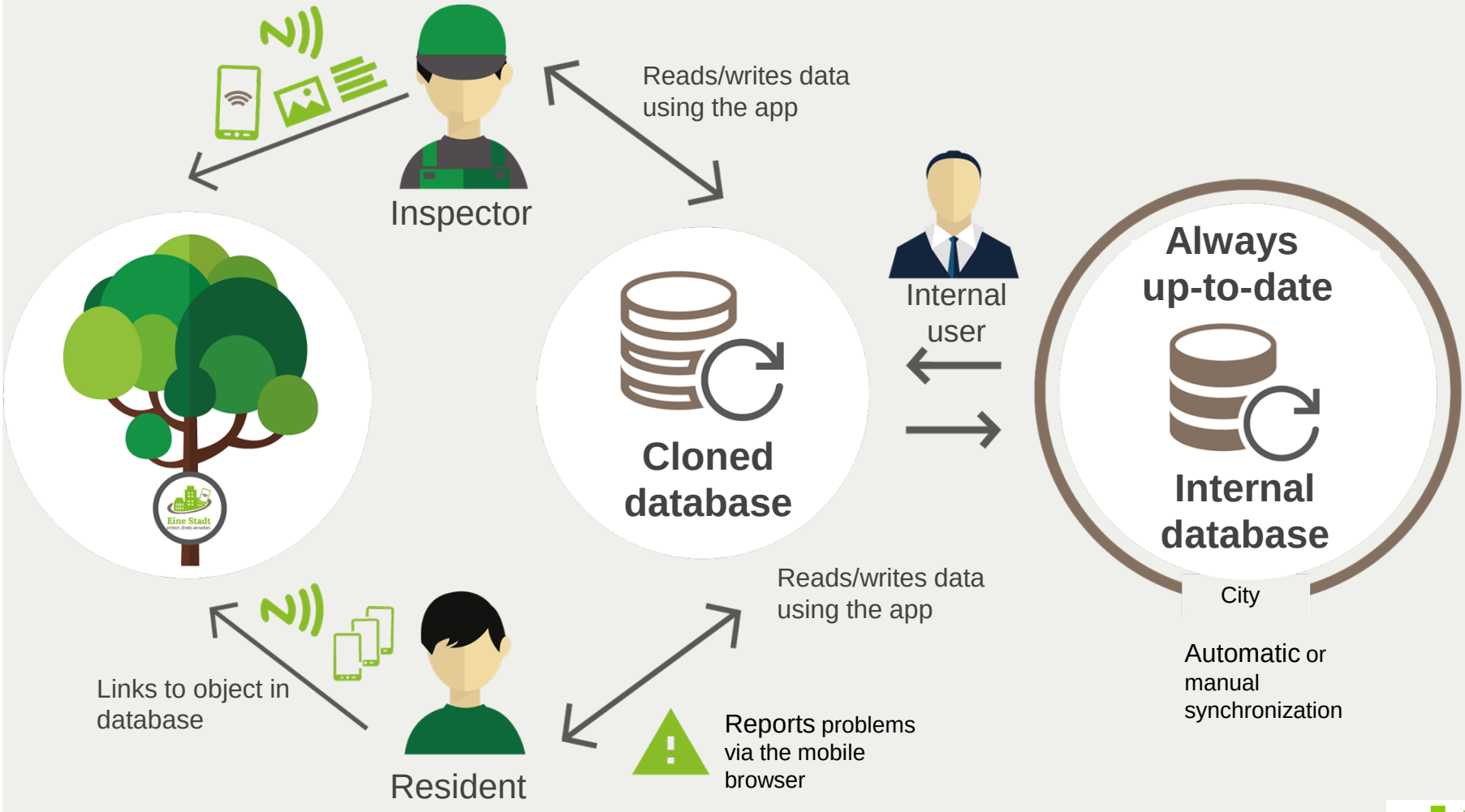
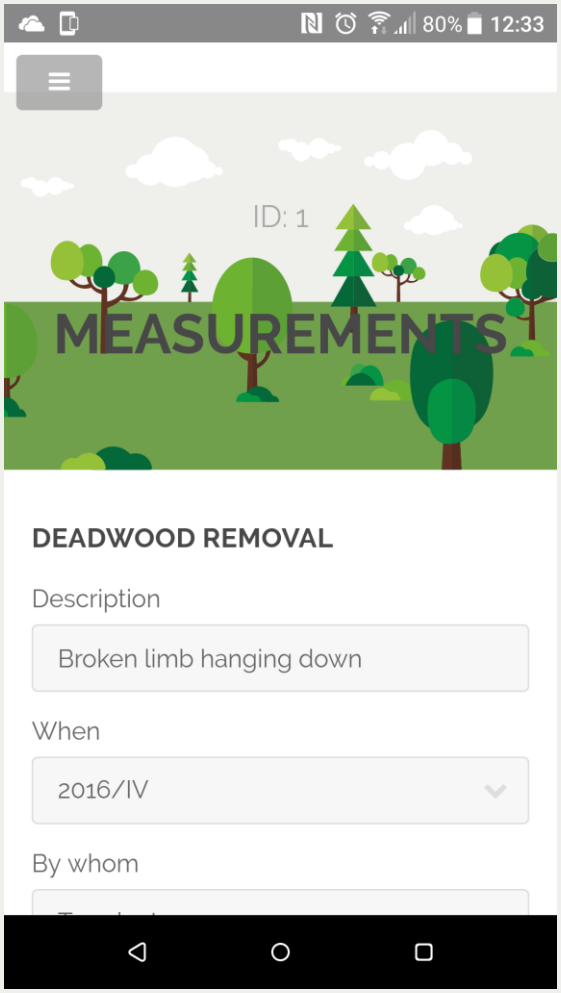
Solution diagram



Live Demonstration



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Key features – development plan

Existing functions	Planned functions
User management	**Map (ESRI)**
Intuitive user interface	Well-arranged object history
Integration of external inspectors	Statistics/Analysis of Usage
Alarm	**Offline mode (ESRI)**
Master data sheet	Inspection tour
Citizen report system	**Reminder**
Data import/export (Excel, CSV)	
Up-to-date security standards	
Administration tool	
Photo/video upload	
Permission management	

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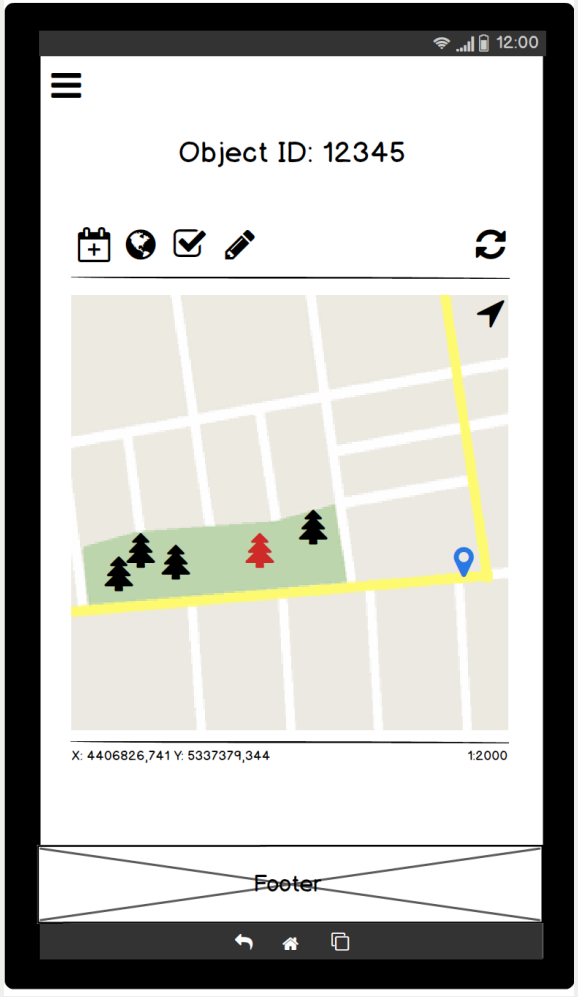
Need of ESRI Geo Services

- **Create geometries** in map with tools like distance measuring
- **Retrieve data** of objects
- **Display** all objects in DB in the map
- **Navigation** to objects



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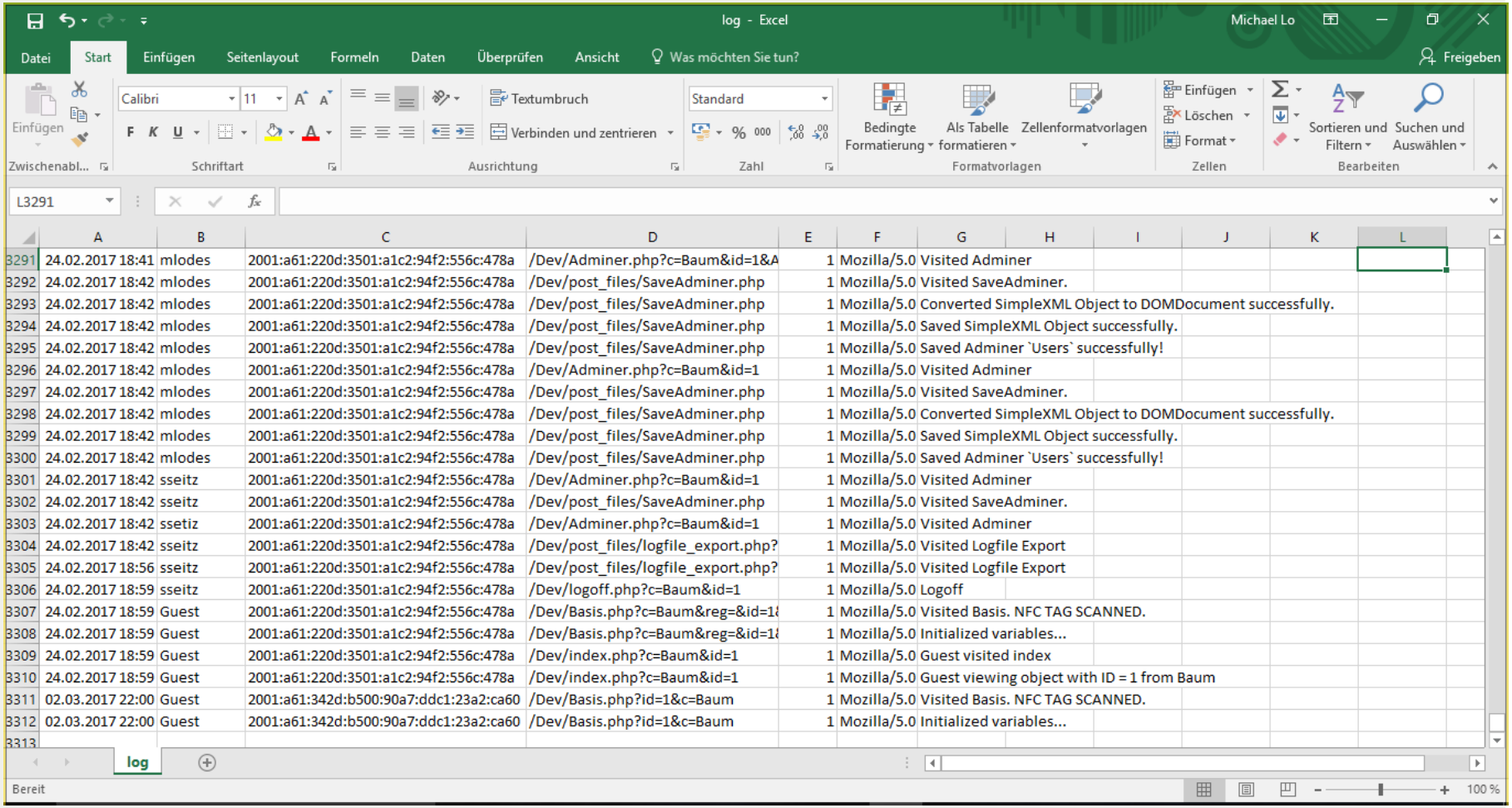
Example Application - Logfile



log - Excel

	A	B	C	D	E	F	G
3291	24.02.2017 18:41	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Adminer.php?c=Baum&id=1&A	1	Mozilla/5.0	Visited Adminer
3292	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Visited SaveAdminer.
3293	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Converted SimpleXML Object to DOMDocument successfully.
3294	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Saved SimpleXML Object successfully.
3295	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Saved Adminer `Users` successfully!
3296	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Adminer.php?c=Baum&id=1	1	Mozilla/5.0	Visited Adminer
3297	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Visited SaveAdminer.
3298	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Converted SimpleXML Object to DOMDocument successfully.
3299	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Saved SimpleXML Object successfully.
3300	24.02.2017 18:42	mlodes	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Saved Adminer `Users` successfully!
3301	24.02.2017 18:42	sseitz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Adminer.php?c=Baum&id=1	1	Mozilla/5.0	Visited Adminer
3302	24.02.2017 18:42	sseitz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/SaveAdminer.php	1	Mozilla/5.0	Visited SaveAdminer.
3303	24.02.2017 18:42	ssetiz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Adminer.php?c=Baum&id=1	1	Mozilla/5.0	Visited Adminer
3304	24.02.2017 18:42	sseitz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/logfile_export.php?	1	Mozilla/5.0	Visited Logfile Export
3305	24.02.2017 18:56	sseitz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/post_files/logfile_export.php?	1	Mozilla/5.0	Visited Logfile Export
3306	24.02.2017 18:59	sseitz	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/logoff.php?c=Baum&id=1	1	Mozilla/5.0	Logoff
3307	24.02.2017 18:59	Guest	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Basis.php?c=Baum&reg=&id=1	1	Mozilla/5.0	Visited Basis. NFC TAG SCANNED.
3308	24.02.2017 18:59	Guest	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/Basis.php?c=Baum&reg=&id=1	1	Mozilla/5.0	Initialized variables...
3309	24.02.2017 18:59	Guest	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/index.php?c=Baum&id=1	1	Mozilla/5.0	Guest visited index
3310	24.02.2017 18:59	Guest	2001:a61:220d:3501:a1c2:94f2:556c:478a	/Dev/index.php?c=Baum&id=1	1	Mozilla/5.0	Guest viewing object with ID = 1 from Baum
3311	02.03.2017 22:00	Guest	2001:a61:342d:b500:90a7:ddc1:23a2:ca60	/Dev/Basis.php?id=1&c=Baum	1	Mozilla/5.0	Visited Basis. NFC TAG SCANNED.
3312	02.03.2017 22:00	Guest	2001:a61:342d:b500:90a7:ddc1:23a2:ca60	/Dev/Basis.php?id=1&c=Baum	1	Mozilla/5.0	Initialized variables...
3313							

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Logged activities in user interface

FILTER ACTIVITIES

Object type

Street Lamp

Object number

-All-

User

sseitz

Space of time

01.01.2017 - 06.03.2017

Date	User	Object number	Activity
24.02.2017 18:41	sseitz	3	Login successfull
24.02.2017 18:41	sseitz	3	NFC SCANNED. Visited Basis.
24.02.2017 18:41	sseitz	3	Displaying data: ID = 3, Leuchtmittel = Quecksilberdampflampe
24.02.2017 18:41	sseitz	3	Saved data: Leuchtmittel = 'LED'
24.02.2017 18:42	sseitz	3	Logoff

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Trees

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Dog station

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Street lamp

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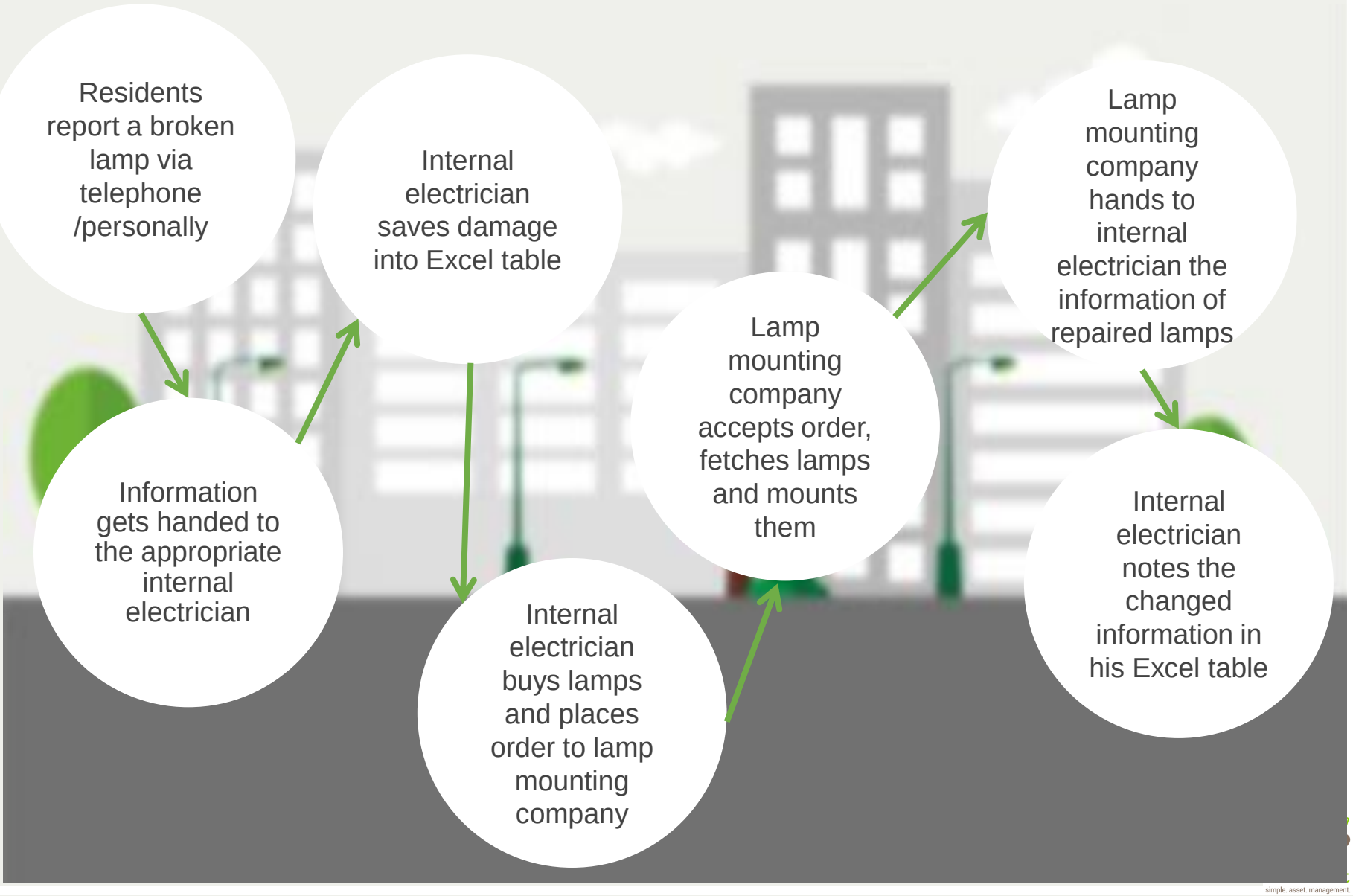
Example scenario: Repairing a street lamp



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Alternative process

Resident

- Reports lamp defect at street lamp chip
- Gets automatically feedback per email when fixed

Internal electrician

- Receives message about new defect
- Inspection of lamp if necessary
- Issues order to fix defect

Mounting company

- Receives order per email
- Fixes lamp
- Saves fixed status at street lamp chip

Cemetary (incl. terminal)

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Waste bins

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Playground

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Further possible applications

- Benches
- Manhole covers
- Traffic sings
- Hydrants
- Public toilets
- Museums
- Paths/trails

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Technology

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Technology & Flexibility

Technology

- Android (5.1+) Smartphones/Tablets
- MySQL Database
- Future: ESRI Geodatabase (Server ↔ Client)
- Web-Application (PHP, HTML CSS)
- Hybrid Android App with Webview and Java

Flexibility

- The software works with all kinds of NFC chips
- Independent purchase on the internet (Ebay, Amazon, NFC21) or comfortable purchase on EineStadt Order Portal.
- The app works on all Android devices with integrated NFC

Independent, flexible and future-proof ✓

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How does our solution make use of NFC and software?

HzekMhuXzB
NG7TXUNJF
Uho1L87zTjlk
TofK-IYvn99I
= 1

NFC Chip attached to a tree is scanned → Saved URL is opened in App → Coded ID is decoded → Searches for tree in database → Tree data is shown

https://www.spatialcontrol.de/Dev/Basis.php?c=Baum&id=HzekMhuXzBNG7TXUNJFUho1L87zTjlkTofK-IYvn99I

primarykey	baumhoehe	baumart
1	10.00	Amelanchier lamarckii - Flesenbirne, kupferrote Fe..
10	20.00	Quercus robur Deutsche-Eich
11	19.00	Tilia platyphyllos -

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EineStadt „special“ NFC chips

Tree

- Screwhead is hidden in the chip (non-hazardous)
- Delivered with a special screw – the tree is not injured

Grave/Cemetery

- Piously and unobtrusive e.g. in black and white
- Special glue provides a long-lasting fit – even on mossy, rough nature stone

Street Lamp

- Flexible "On-Metal" chips held by sturdy facade glue for oval, bent surfaces

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Revenues

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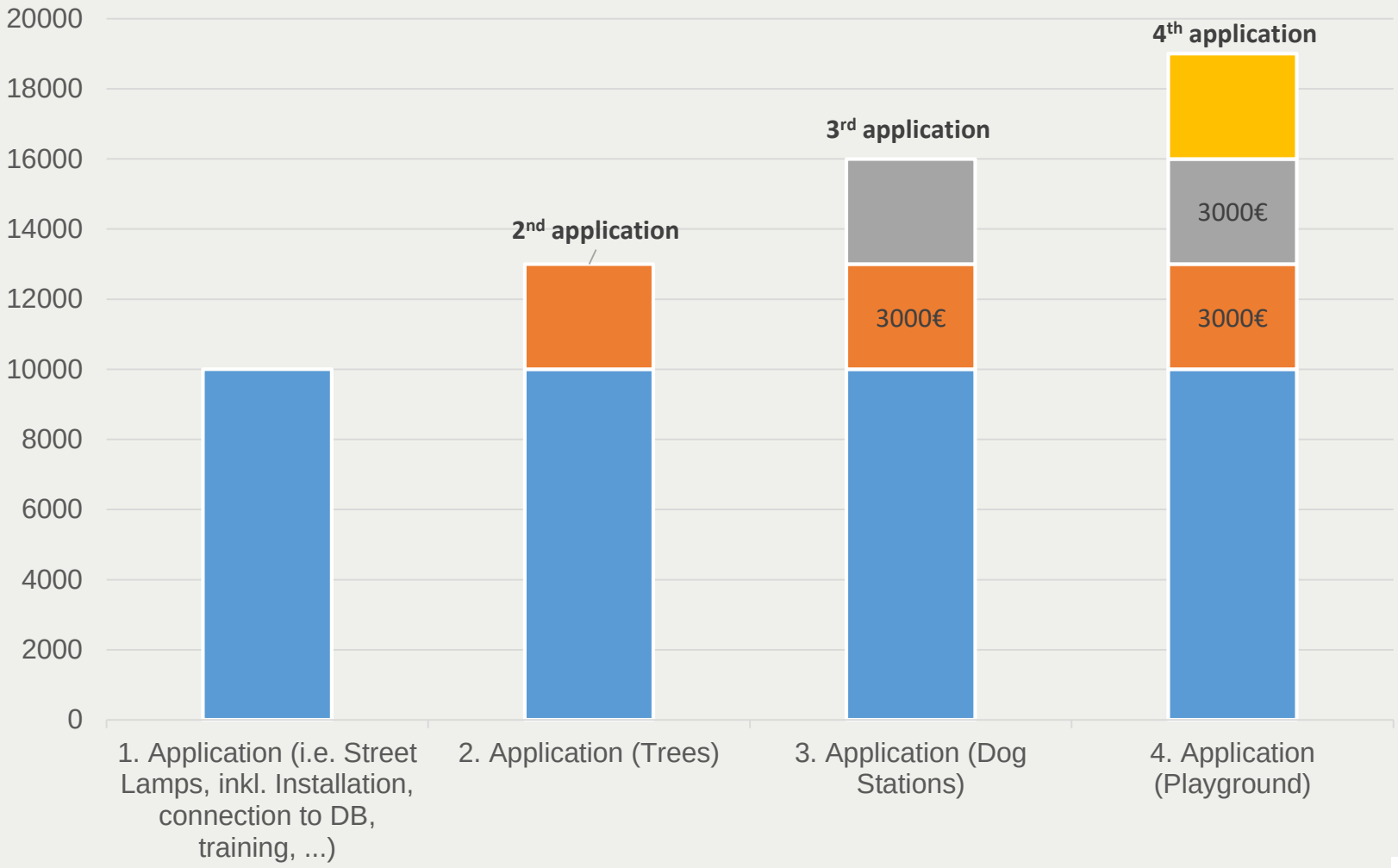
One-Off Revenues



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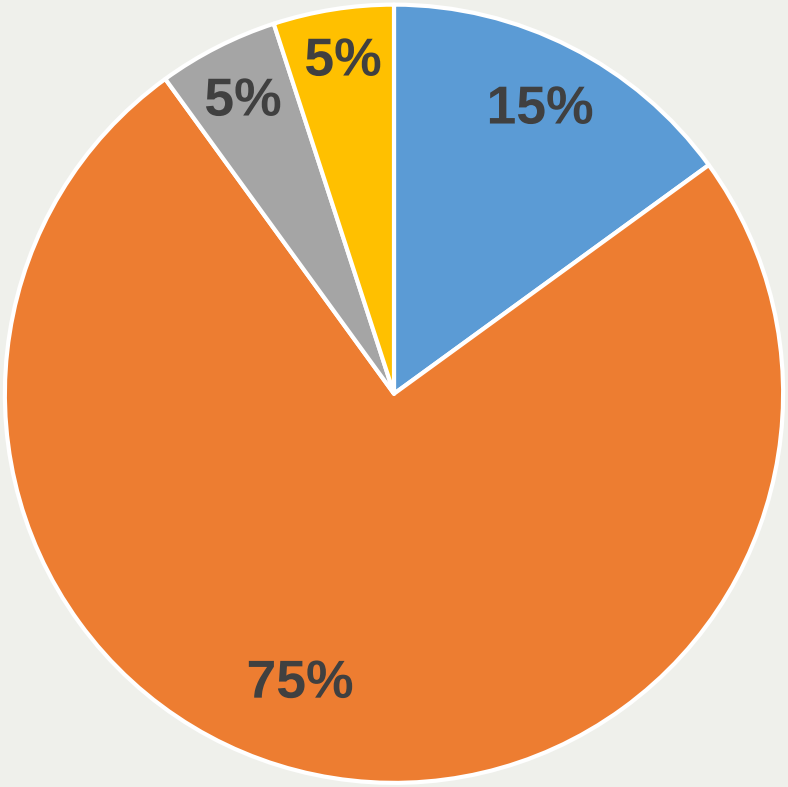
Annual Reveneue Stream for One Customer



Annual Revenue ~ 40% of license cost

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Field test in Schwabmuenchen

- November 2016: Mounting first NFC-Chips on trees for initial hard- and software test in Schwabmuenchen
- January - March 2017: Numerous presentations at different departments and decision makers at Schwabmuenchen city administration. Agreement to test the following applications:
  - Trees
  - Dog stations
  - Cemetery terminal / gravestones
  - Street lamps
  - Waste bins, benches
  - Optional: traffic signs
- March 2017 Implementation of software and hardware, start of the test

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Backup Slides

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Challenges

Chips

- Do NFC-Chips exist that survive more than 10 years in an outdoor environment
- Only with one-year guarantee available, we had to make our own tests.

Bugs

- Extensive bug testing on various numerous devices

Case/Bag for outdoor tablet

- It was extremely difficult to obtain a case for our tablet, only a special equipment company

Reality checks

- Testing of the solution in the field, especially important together with the inspector

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Implementation Plan

1.

Approval by decision maker

3.

Software implementation

2.

Purchase of tablet and NFC-chips

4.

Attaching the NFC-chips

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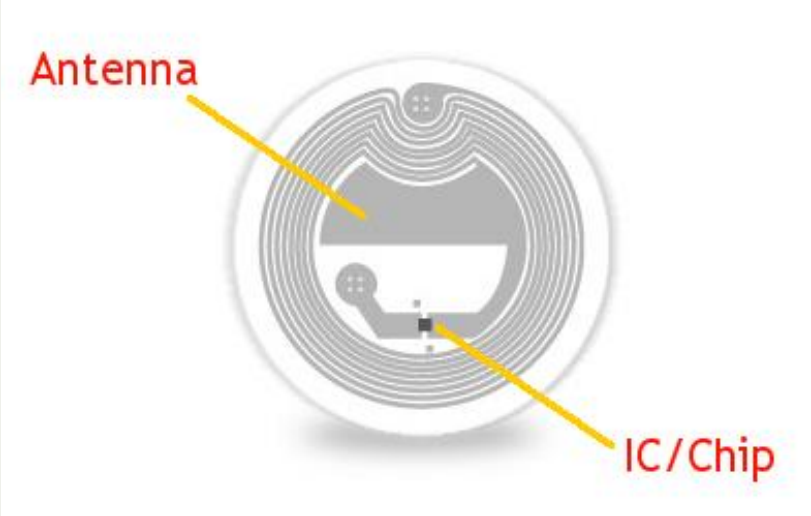
NFC – chip cross-section

„**N**ear **F**ield **C**ommunication“: Reading distance 0-3cm

- No battery
- The bigger the antenna, the bigger the reading distance



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Compatible devices – tablets and smartphones

For inspectors

„**Samsung Tab Active**“

- IP67, 1,2m fall proof
- MIL-STD 810G2
- Android 5, HD Display, LTE, Camera
- Easy handling/Pen/Neck strap
- 12h+ battery life
- KNOX-technology provides up-to-date securiy standards
- ca. 400€

All other Android 5.x, 6.x and 7.x devices with NFC are fully comaptible with the software and our NFC chips!

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