Experiences in development of Silence-GIS

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Silence-GIS

- Introduction
- Hardware and IT structure
- Practical and technical challenges
- Scrum development method
- Conclusion
Introduction

- Silence is a large-scale noise management system for the standardisation of noise mapping (assessment), development of noise policy and action planning around highways

- Latest version 3 developed on ArcGIS 9.x for Windows

- Used by 15 regional offices of the Dutch Ministry of Transport to support regional and national scale noise policy/strategy
Silence 3

- Main development tools: Delphi, Visual studio, ArcGIS
- Noise database and calculation core in GIS environment
- Uses standard Predictor™ calculation clients
- Calculates noise exposed area/people/dwellings
- Scenario comparisons with Trend analysis

- 40,000 km²
- 3 million buildings
- 700 km barriers
- 7000 km highways
- Dataset for 15 years
- 100 Gb
Silence architecture

Oracle database

ArcGIS

Silence user interface

Maps

Tables

Predictor calculation clients

SoftNoise
Deployed components

Procedures
- maintenance
- ITIL

Citrix server (20 users)
- Windows
- ArcGIS 9.x
- Silence extension

Data and calculation servers
- ESRI SDE / Oracle Database
- Acoustic data & Meta data
- Predictor calculation cluster

ICT infrastructure

User group (15)
IT specialists
Developers
GIS specialists
Data specialists
Noise experts

Management

Developers
GIS specialists
Data specialists
Noise experts

ITIL

Developers
GIS specialists
Data specialists
Noise experts

User group (15)
IT specialists
Extensive scenario management

Data sources (per year):
- Highway network (NWB)
- Traffic flow data (INTENS)
- Road properties (WEGGEG)
  - Road surface type
  - Lanes
  - Barriers
  - Legal speeds
- Districts and neighborhoods (CBS)
- Ground use (CBS)
- ZIP code areas for population (6PPC)
- Address points (ACN)
- Buildings (Top10-vector)

Data set 2003

Study area

Scenarios:
- Base alternative
- Quiet road Surface
- Reduced speeds
- Prognosis traffic flow
Data challenges for national coverage

- Missing data: Interpolation and applying defaults e.g. for traffic flows on roads without passing vehicle registrations

- Unknown road width (assumes always 1 panic lane)

- Missing data e.g. heights

- Update frequency of data

- Fail safe algorithm for projecting data along roads using hectometer signs
Silence history

• 1995 Version 1 developed by commercial ICT provider for the Dutch Ministry of transport
  ➢ Waterfall method

• 2001 Version 2 development based on Arcview/Avenue by DGMR/Nieuwland
  ➢ Iterative Waterfall method
  ➢ ITIL service management method

• 2007 Version 3 development based on ArcGIS/VB.NET by DGMR/Nieuwland
  ➢ Scrum method
  ➢ ITIL service management method
Waterfall method

- 8 main stages:
  - Scoping
  - Functional design
  - Technical design
  - Realization
  - Test
  - Acceptance
  - Implementation
  - Maintenance

- Each stage averaging several months and a go/no-go decision
- Long time to market for a new release of the product
- Extensive (and often very inaccessible) documentation set
The Scrum development method
‘Daily’ Scrum Team Meeting

- **Standup Meeting**
- 3 questions (5 minutes per person)
  - What did you do the last days
  - What problems did you encounter
  - What are you doing the next days

- Start/end meetings for sprints with product owner/stakeholders

*The Chicken is involved, but the Pig is committed!*
Burndown chart

Sample Burndown Chart

- Completed tasks
- Remaining effort
- Ideal burndown
- Remaining tasks

Remaining effort (hours)

Remaining and completed tasks

Day: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Conclusion

- Building and maintaining a large-scale noise management system is a complex task and should not be underestimated.
- Organisations may decide to outsource in order to expand resources, buy-in knowledge or limit risks.
- Demands, requirements and legislations evolve over time and calls for well-defined maintenance tasks to keep the system up-to-date.
- Product owner/client needs to be part of the development team.
- A flexible development method like the scrum method is needed to keep the system up to date.
Thank you for your attention