



Company cases: Lotus Demolition

Juha Tanner



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Presenter: Juha Tanner

Operational Overview

- ▶ **Demolition Works**
 - ▶ Renovation Demolition
 - ▶ Building and property Demolition
 - ▶ Industrial Demolition
 - ▶ Asbestos and Hazardous Material Removal
- ▶ **Inspections and surveys**
 - ▶ Asbestos and Hazardous material survey
 - ▶ Indoor air quality surveys
 - ▶ Condition surveys
 - ▶ Pre-demolition audit



AI implementation challenges in our company

- ▶ **Lack of AI specialists**

Limited availability of GenAI architects/developers makes it challenging to build, customize, and maintain solutions internally

- ▶ **Risk of hallucinations and incorrect outputs**

Generative AI may produce plausible but wrong technical, legal, or safety-critical information

- ▶ **Confidential data protection**

Project documents, contracts, and site reports may contain sensitive information that must not leak through AI tools

- ▶ **User trust and over-reliance**

Staff may either distrust the system or rely on it too much without proper verification

Project Kick-off

Originally a procurement for the Demolition Works –Department

- ▶ AI-powered solution for automated site diaries

Later expanded to the Inspections –Department

- ▶ Building condition assessment
- ▶ IAQ-survey



Use case: Building inspections report creation

General work overview

Purpose and Objectives

- ▶ Evaluate physical state
- ▶ Identify deficiencies
- ▶ Ensure compliance
- ▶ Plan for the future

Methodology

- ▶ Documentation review
- ▶ Walk-through survey
- ▶ Condition ratings
- ▶ Cost estimates

Use case: Building inspections report creation

AI tool Summary

- ▶ **Business needs**
 - ▶ Decrease the service price via time and cost savings
- ▶ **Solution**
 - ▶ Automate the process of compiling reports
- ▶ **Input**
 - ▶ Documents about the building
 - ▶ Voice-recorded notes and observations
 - ▶ Site Photos
 - ▶ Report template
- ▶ **Output**
 - ▶ Building Inspection Report
- ▶ **Expected benefits**
 - ▶ Time and cost savings
 - ▶ The price for the inspections and surveys decreased



Use case: Building inspections report creation

Stage 1: Data ingestion

▶ Task

Process unstructured documents, photos and audio and select data

▶ Result

Relevant data selected and present in markdown format

AI suggests files

▶ user verifies

The screenshot displays the 'Inspection Report Writer Assistant' web application interface. The top navigation bar shows the application name and version (2.2). The main workspace is divided into several sections:

- Documents Analysis:** A table showing the results of document analysis for the folder 'C:\code\Lotus-Demolition\building-inspection-report\data-for-use-case_CASE2\...'. The table includes columns for NAME, EXT, STATUS, DOC TYPE, SIZE, and MODIFIED. It lists various folders and files, including '1999 laajennus', 'Muutos_2013_astianpesu_pala...', 'Perusparannus 2014', 'DWG', 'Muistiot', 'PDF', 'pohjatutkimus', 'sisäilmakorjaus 2022', and 'Skannatut suunnitelmat'.
- Selected Knowledge Sources:** A table listing selected files for analysis, including 'raportti Sotungin koulu VALMIS.pdf', '001 pohjatutkimus no. 6923.pdf', 'tillijulkisivun korjaus.pdf', 'RS001_21.4.2023.pdf', 'paloilmoittimen tarkastustodistus 1.pdf', 'tarkastustodistus 1.pdf', 'Käyttöohjeopäätökirja.pdf', and 'parsed_transcript.txt'.
- File Details:** A section providing metadata for a selected file, including its name, size, extension, category, file type, creation and modification dates, and analysis status.
- Application Logs:** A log at the bottom showing the application's activity, such as 'Updated refined file assignments' at various times.

Use case: Building inspections report creation

Stage 2: Data refinement

► Task

Convert raw data into section-wise refined data

► Result

Relevant knowledge in compact and organized form

AI suggests & compiles data

► user verifies

This stage is optional:
For small data, can be omitted

The screenshot shows the 'Inspection Report Writer Assistant' web application. The interface is divided into several sections:

- Header:** 'Inspection Report Writer Assistant version 2.2' with a settings icon.
- Progress Bar:** 'Documents analysis complete' with file statistics: 'Files: 1201', 'Size: 1017.24 MB', 'Folders: 3'. Navigation tabs for 'Stage 1 - Intake', 'Stage 2 - Refine' (active), and 'Stage 3 - Report' are present.
- Left Sidebar:** 'Result Workspace' with a file path 'C:\code\Lotus-Demolition/' and a 'Browse' button. Below it is 'Knowledge Refinement' with a 'Refine Knowledge' button and a 'Completed' status indicator.
- Main Content Area:**
 - Selected Files:** A table for selecting documents to build a refined knowledgebase. The table has columns for file name, doc type, direct, and nine numbered categories (1-9).
 - Refined Knowledge:** A table showing the result of the refinement process, listing file names and their source counts.
 - File Details:** A panel for the selected 'parsed_transcript.txt' file, showing its path, name, size, extension, category, file type, creation/modification dates, and analysis status.
- Bottom Panel:** 'Application Logs' showing three log entries: '[8:58:06 PM] Updated refined file assignments', '[8:58:08 PM] Updated refined file assignments', and '[8:58:09 PM] Updated refined file assignments'.

Use case: Building inspections report creation

Stage 3: Writing the report

▶ Task

Combine all data and write all or selected sections of the report (images included)

▶ Result

Draft of the report (docx)

AI suggests & writes

▶ user verifies

The screenshot shows the 'Inspection Report Writer Assistant' web application. The interface is divided into several sections:

- Header:** 'Inspection Report Writer Assistant version 2.2' with a settings icon.
- Progress Bar:** Shows 'Documents analysis complete' and 'Files: 1201 | Size: 1017.24 MB | Folders: 3'. It also has three stage indicators: 'Stage 1 - Intake', 'Stage 2 - Refine', and 'Stage 3 - Report' (which is active).
- Left Sidebar:**
 - 'Result Workspace' with a file path 'C:/code/Lotus-Demolition/' and a 'Browse' button.
 - 'Report Generation' section with checkboxes for 'Full report (all 9 sections)' and 'LLM proofread', and buttons for 'Generate Report' and 'Compose DOCX'. A 'Completed' status is shown.
- Main Content Area:**
 - 'Refined Knowledge Assignment' section with a table for selecting knowledge files for different report sections.
 - '3. PTS-Ehdotus Completed' and '4. Yleistiedot Completed'.
 - '5. Aluerakenteet ja rakennustekniikka Completed' and '6. LVI järjestelmät Completed'.
 - '7. Sähkötekniset järjestelmät Completed' and '8. Tietotekniset järjestelmät Completed'.
 - '9. Kehitystarpeiden arviointi Completed' and 'Final Report Ready'.
- Bottom Panel:** 'Application Logs' showing '[9:18:21 PM] Report finished'.
- File Details Panel:** Shows details for 'parsed_transcript.md', including name, size, extension, category, file type, creation/modification dates, and a summary.

Use case: Building inspections report creation

Preliminary results and next steps

- ▶ **Tool can handle all typical filetypes**
 - ▶ Technical drawings (e.g., .dwg) are not supported, some PDFs are also difficult
- ▶ **High transparency: designed to give the user lots of control**
 - ▶ Settings to choose LLMs (per task) and related parameters
 - ▶ Open and edit all intermediate (.md) files
 - ▶ Choosing how knowledge is processed (with/without refinement)
 - ▶ Creating partial reports (specific sections)
 - ▶ All main prompts and templates are editable
- ▶ **Next step: Evaluating generated reports against real ones (scoring)**
 - ▶ LLM choices and user interactions can result in very different reports
 - ▶ Because of LLMs, exactly same report cannot be generated twice even with same exact steps and settings

Use case: Final text product



Julkisivun ja yläpohjarakenteen kuntotutkimus

Euran harjaantumiskoulu (puukoulu)

SORKKISTENTIE 16
27510 EURA

4 Ulkoseinät

4.1 Julkisivut

Yleiskuvaus

Ulkoseinien hirsirunko oli vuorattu sahapintaisella peiterimaverhouksella, joka on maalattu. Verhouslaudan ja hirsirungon välissä ei ole tuuletusrakoa.

Havainnot

Verhouslaudoitus oli silmämääräisesti tarkasteltuna monin paikoin hieman huonossa kunnossa. Siinä on runsaasti maalivaurioita, mutta myös lahovaurioita havaittiin. Osittain vauriot ovat aiheutuneet seinustan pensaikosta, mutta myös muilla julkisivuilla havaittiin vaurioita.

Huoltomaalaustarve on melko pikainen, mikäli verhous halutaan säilyttää. Osa verhouslaudoista joudutaan siitakin huolimatta uusimaan lahovaurioiden vuoksi. Myös ikkunoiden koristeellisten vuorilaudoitusten kunnostus on hyvin ajankohtainen, sillä niissä oli jo runsaasti pehmennyttä puuta, joka joudutaan uusimaan.

Verhouslaudoituksen ja hirsirungon välissä ei valitettavasti havaittu tuuletusrakoa, joka auttaisi hirsirunkoa pysymään kuivempänä ja kastuessaan kuivaisi nopeammin. Verhouslaudoitus on alareunastaan monin paikoin jo niin pehmeää, ettei sitä voida enää huoltomaalata. Alareunastaan pehmenneiden lauttojen osuus verhouksesta on arviolta 10 %. Huomattavasti suurempi osa on juuri pehmenemässä, jonka vuoksi sen korjauskelpoisuus on syytä arvioida mallityöllä.



Kuva 1. Katujulkisivu, verhouslauta on alareunasta melko kelottunut ja osittain myös pehmennyt.

Use case: Cost table appendix

Proposed actions		Condition Rating	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
2.3	Recommended condition surveys and additional investigations												
	More detailed investigation of building settlement and the damage caused by it			7									7
	Condition survey of balconies			4									4
	Assessment of the need for fire-stopping installations at roof penetrations		1										1
	Assessment of the need to renew the roof covering		1										1
5.1	Site structures	3											
	Patch repairs to sand-covered surfaces			5						5			10
	Periodic inspection of playground equipment		0,5										0,5
5.2	Foundations, ground-contact structures, and drainage systems	3											
	CCTV inspection and flushing of drainage pipes		4										4
5.3	Building frame	3											
5.4	Facades	3 - 4											
	Cleaning of facade surfaces where necessary			6									6
	Repairs to rendered surfaces and maintenance painting where required			10									10
5.5	Windows	1 - 4											
	Repair and/or replacement of windows		12		40								52
5.6	External doors	2 / 4											
	Maintenance repairs to wooden external doors (surface treatments, sealing)					3							3
5.7	Roof structures and roof covering	2 - 4											
	Installation of access bridges where missing		6										6
	Cleaning of the roof covering where necessary using biodegradable products		4										4
	Partial renewal of the roof covering in the worst areas						50						50
5.8	Spaces												
5.8.1	Common areas	3											
	Renewal of surface structures as needed (cost allowance)				10				10				20
	Replacement of fixtures and equipment as required					7				7			14
	Renovation of the oldest wet rooms / WC facilities										30		30
5.8.2	Technical spaces	2 / 4											
	Total		28,5	32	50	10	50	0	10	12	30	0	222,5



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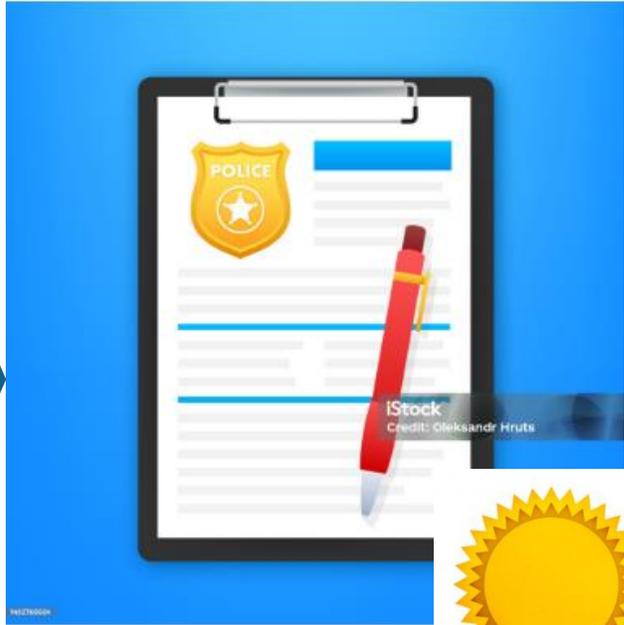
Open for discussion and questions



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THE FUTURE OF DEMOLITION

How AI works: Executive View





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Thank you!



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