Company cases: Lotus Demolition

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Co-funded by the European Union

Haaga-Helia

UNIVERSITY OF HELSINKI

Tampere University

In collaboration with

FAIR Finnish AI Region | EDIH

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

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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

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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

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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

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Use case: Building inspections report creation

Stage 1: Data ingestion

- **Task**

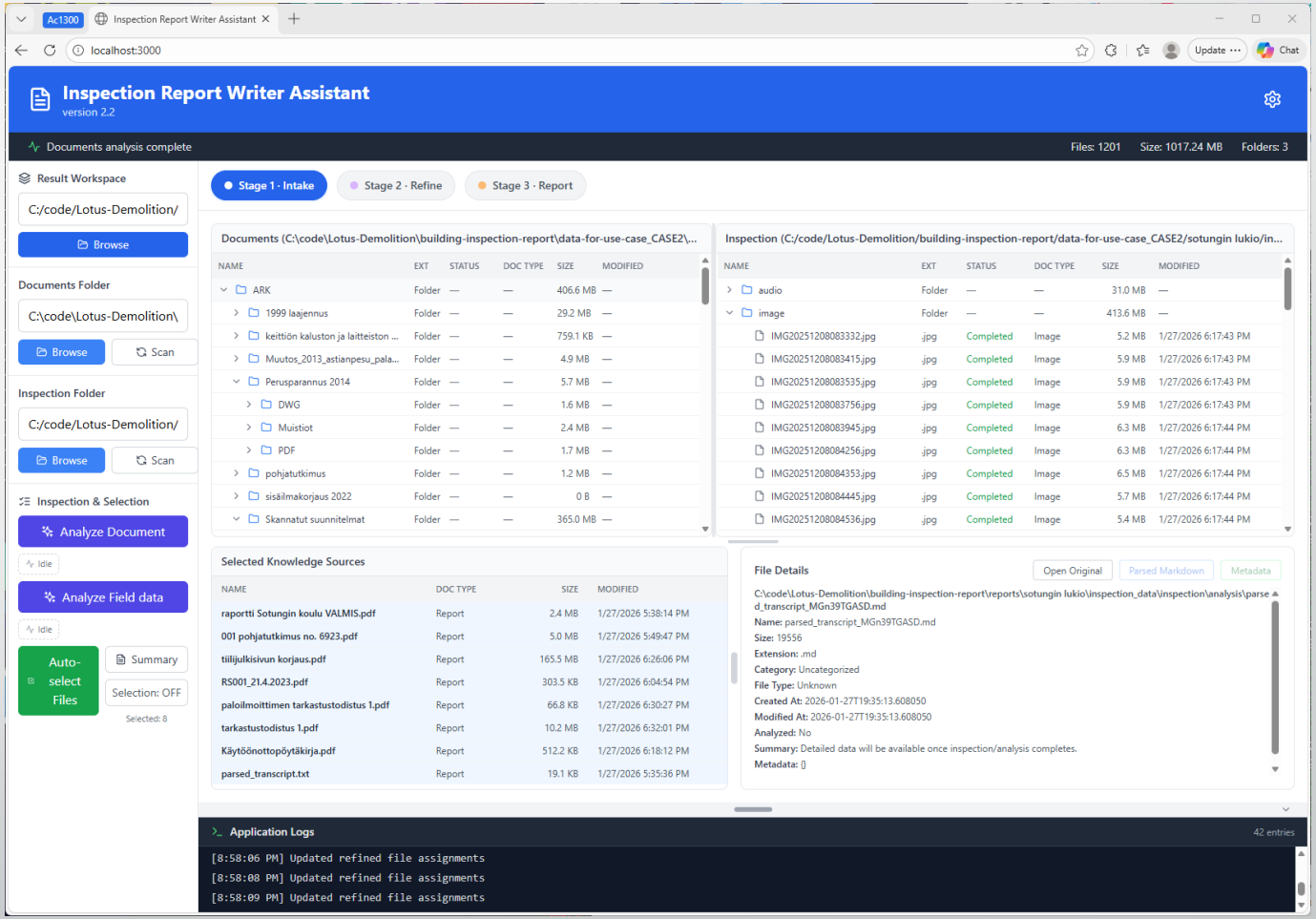
  Process unstructured documents, photos and audio and select data

- **Result**

  Relevant data selected and present in markdown format

AI suggests files

- user verifies



Use case: Building inspections report creation

Stage 2: Data refinement

- **Task**

  Convert raw data into section-wise refined data

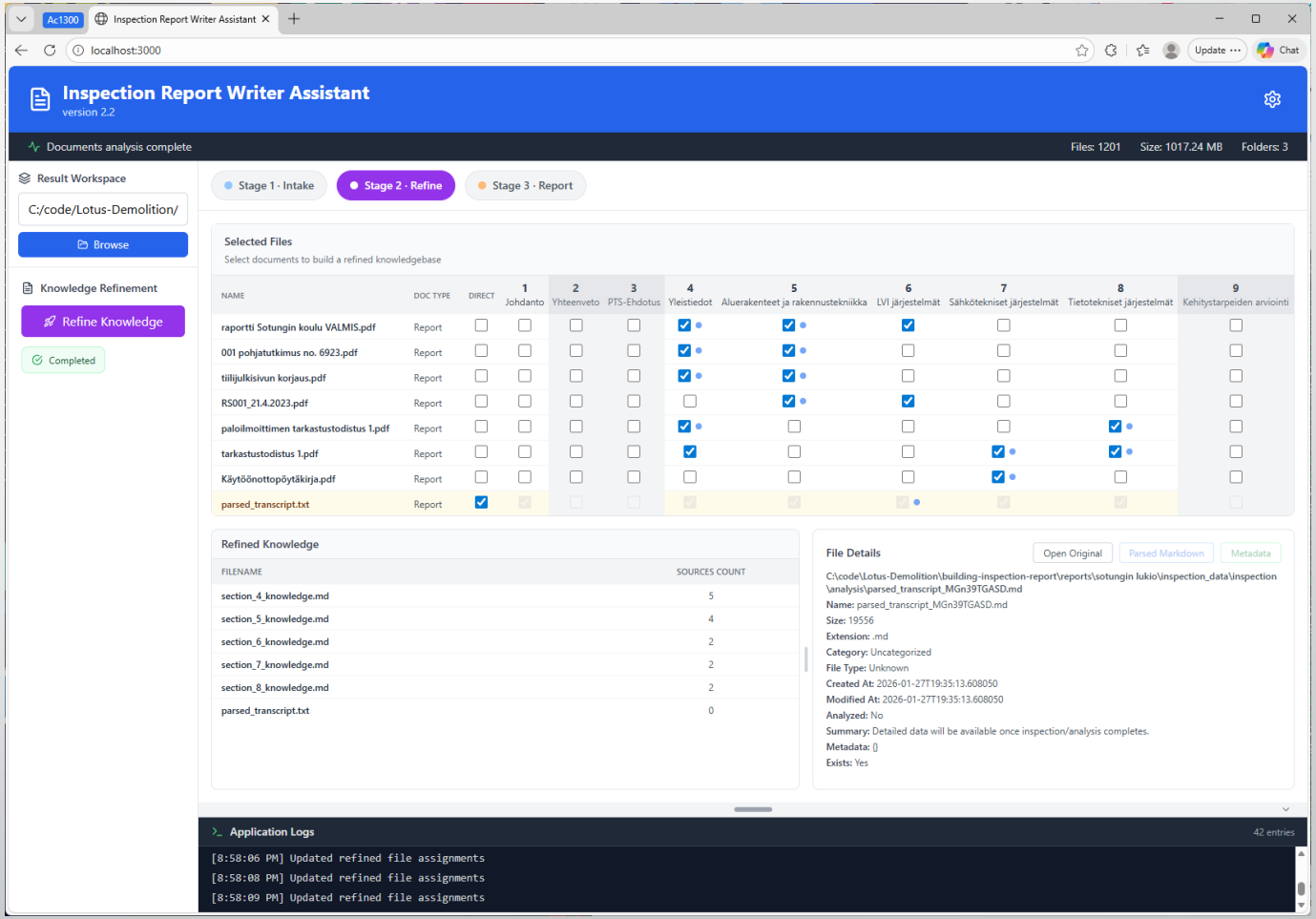
- **Result**

  Relevant knowledge in compact and organized form

AI suggests & compiles data

- user verifies

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



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Use case: Building inspections report creation

Stage 3: Writing the report

- **Task**

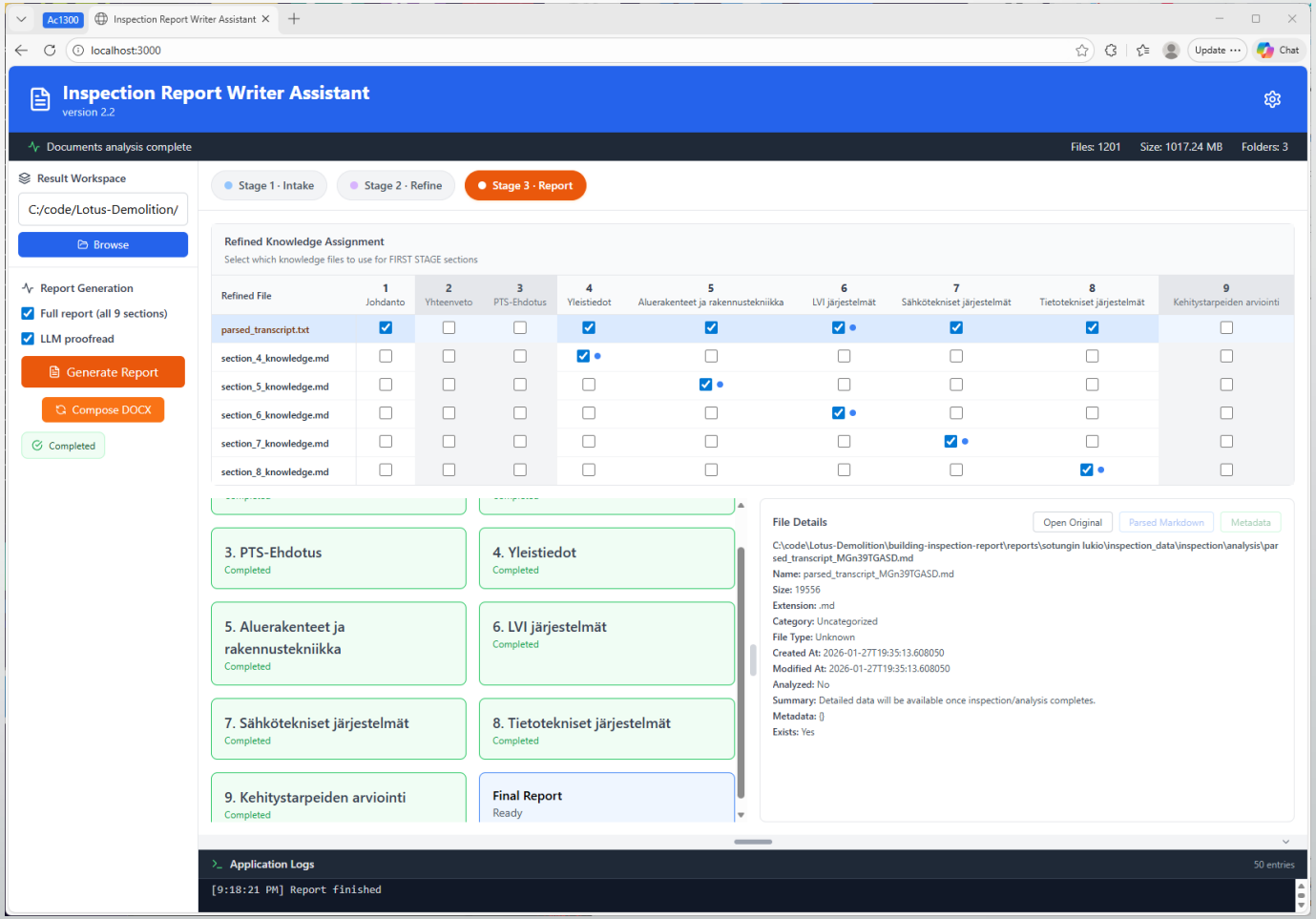
  Combine all data and write all or selected sections of the report (images included)

- **Result**

  Draft of the report (docx)

AI suggests & writes

- user verifies



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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

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16.1.2026

Julkisivun ja yläpohjarakenteen kuntotutkimus

Euran harjaantumiskoulu (puukoulu)

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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 siitäkin 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 kuivempana ja kastuessaan kuivaisi nopeammin. Verhouslaudoitus on alareunastaan monin paikoin jo niin pehmeää, ettei sitä voida enää huoltomaalata. Alareunastaan pehmenneiden lautojen 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.*

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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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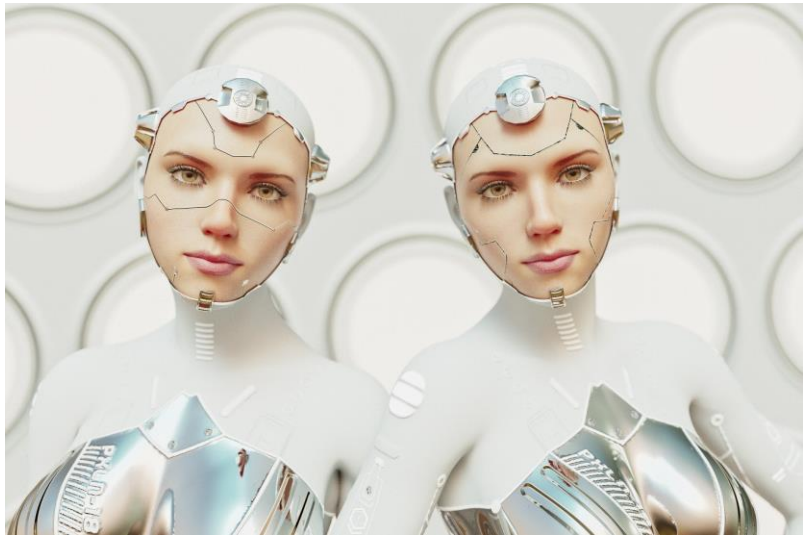
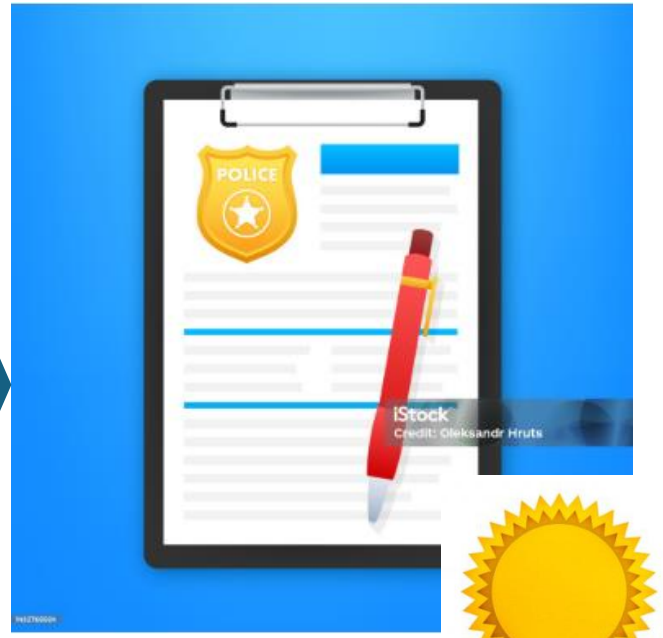
How AI works: Executive View

GAIK





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Thank you!

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