1   Appendix 2: Lessons Learned

As a result of the demonstration, lessons learned were collected from project partners. These lessons contain highlights on what worked well in the demonstrations, what ended up being a challenge, and what could have been done differently if the demonstration were to be implemented again. A list of the reported lessons learned is presented in the table below.

Table 1. Lessons Learned Reported as a Result of the Demonstrations.

#	Lesson name	Description	Demonstration	Type	Reporter	Industry domain				InnoSale component					
						Material Handling (LLE & CTO)	Software Market (DPM)	Automotive (SM)	Waste Management (WM)	User dialogue component	Knowledge acquisition component	Knowledge base	Inference engine	Existing IT-systems	External data sources
1	Handling Agglutinative Languages	Turkish's complex morphology required custom NLP solutions for summarization.	6.5 Transcription and Summarization	Technological	Dakik			x				x	x		
2	Fine-Tuning Whisper for	Whisper's Turkish transcription struggled with sheet metal	6.5 Transcription	Technological	Dakik			x				x	x		

	Industry-Specific Terms	terms, but fine-tuning improved accuracy.	and Summarization												
3	Developing a Custom Turkish NLP Pipeline	Due to weak spaCy Turkish support, a custom pipeline was needed for summarization.	6.5 Transcription and Summarization	Technological	Dakik			x					x	x	
4	Semantic Search with FAISS	Document-based search was implemented using FAISS and vector embeddings for efficient similarity calculations.	6.5 Transcription and Summarization	Technological	Dakik			x					x	x	
5	Similarity Calculation Trade-offs	Feature-based similarity is fast, but geometry-based similarity is computationally expensive.	6.5 Pricing	Technological	Dakik			x						x	
6	Optimizing 3D Unfolding in ThreeJS	Large 3D models required algorithm optimizations to improve processing speed.	6.5 Quotation Preparation	Technological	Dakik			x			x				
7	Applying Machine Learning for Pricing	LightGBM was used for pricing, with PCA for dimension reduction to enhance model efficiency.	6.5 Pricing	Technological	Dakik			x					x		
8	Vector-Based Text Similarity Methods	Jaccard Similarity and Cosine Similarity were implemented to improve text summarization.	6.5 Transcription and Summarization	Technological	Dakik			x			x	x			
9	Developing User-Friendly Interfaces	Effective UI design helped users filter search results and	6.5 Quotation Preparation	Business	Dakik			x			x				

		navigate complex data for different roles efficiently.														
10	Hands-on Experience with New Technologies	The project provided practical exposure to NLP, ML, and 3D visualization for our developers	6.5 All	Other	Dakik			x								
11	Parallel definition and implementation	When researching broad topics, overlapping definition and implementation can aid in a more effective development	Guided Selling and 3D Modelling	Business	Konecranes	x										
12	Promotion of joint demonstrators	Joint demonstrators with multible use case providers gives an opportunity to combine efforts to make more comprehensive research & development.	Guided Selling and 3D Modelling	Business	Konecranes	x										
13	International research collaboration	International cooperation give individual partners possibility to access broader resources and conduct larger studies.	Guided Selling and 3D Modelling	Business	Konecranes	x										
14	Utilization of 3D in sales process	Utilization of 3D environments in sales of complex products provides increased customer understanding of the solution.	Guided Selling and 3D Modelling	Technological	Konecranes	x				x						
15	Collecting user requirements	How to collect technical configuration parameters from the customer in a way they can understand it better.	Guided Selling and 3D Modelling	Business	Konecranes	x				x						

16	Data quality	AI need good quality data	Area Based Product Proposal	Technological	Molok				x					x	
17	Evaluation	Received guidance how and which feedback to gather	Area Based Product Proposal	Business	Molok				x	x					
18	Resource management	Identifying resource need for project this size and duration	Area Based Product Proposal	Business	Molok				x						
19	Balancing Accuracy and Explainability	Optimizing model accuracy while ensuring explainability was challenging, requiring continuous tuning, correct model selection, and the use of SHAP to maintain transparency in predictions.	6.5 Pricing	Technological	Adesso			x					x		
20	Exploring 3D Model Analysis Techniques	Multiple 3D analysis methods, including VAE with 3D and rendered images, multi-view learning, PointNet feature extraction, and voxelization, were tested. However, most experiments were challenging to implement, time-consuming, and resulted in poor accuracies, leading to limited practical value for cost prediction.	6.5 Pricing	Technological	Adesso			x					x		
21	Full Risk assement including all	Starting internally with risk assesments for a projecct not just from technical side but also	All	Other	Demag	x	x	x	x	x	x	x	x	x	

	necessary departments	from legal side (with legals) could be of great advantage. Maybe this kind of risk assement could be started even before project begin.														
22	Collaboration and data sensitivity	Data driven projects like InnoSale are very challenging, especially with regards to a international collaboration. Due to sensitvity and GDPR restrictions of the data the cooperation is limited at some point.	6.3 All Demos	Other	Demag	x										