

Overall Chatbot Performance Suammry

Questions	Production Parts			
	Adjusting Nut RERANKER_TOP_K=5 RETRIEVER_TOP_K=15		Plug RERANKER_TOP_K=5 RETRIEVER_TOP_K=15	
	Rating	Generation Time (sec)	Rating	Generation Time (sec)
Activity-based questions (AQ)				
What are the most and least executed activities?		6		9
How many activities does the model have?		3		4
What are the possible start and end activities in my log?		7		11
Which activity is the happened before and after activity X?		5		9
Which activities have instances of rework?		7		9
Process-based questions (PQ)				
What transitions take the highest average time and its frequency?		9		11
What are the main bottlenecks in the process?		12		13
What cases contain self-loops?		7		8
Where am I wasting the most time in the process?		7		11
Which are the highest and lowest transitions on average time and how frequent are they?		15		16
Variant-based questions (VQ)				
How many variants are there in the process?		2		5
Which cases followed the shortest path?		6		3
What is the longest trace regarding the number of activities? How many cases follow this trace?		6		9
How many distinct activities are there in the shortest path?		10		15
I would like to see statistics comparing longest and shortest variants.		15		13

Full QnA Summary

Part Name	Adjusting Nut			Plug		
Question \ Answer	Ground truth	LLM generated result	Time generated	Ground truth	LLM generated result	Time generated
Activity-based context						
What are the most and least executed activities?	Turning & Milling - Machine 8: 10 executions Flat Grinding - Machine 11: 1 executions	- **Most executed activity** : Turning & Milling - Machine 8 (10 times) - **Least executed activity** : Flat Grinding - Machine 11 (1 time)	0 min 6 sec	Turning & Milling - Machine 5: 18 executions Grinding Rework - Machine 12: 1 executions Round Grinding - Machine 23: 1 executions	- **Most executed activity** : Turning & Milling - Machine 5 (18 executions). - **Least executed activities** : Grinding Rework - Machine 12 (1 execution), Round Grinding - Machine 23 (1 execution).	0 min 9 sec
How many activities does the model have?	Total number of activities: 7	- The model has 7 activities.	0 min 3 sec	Total number of activities: 18	- The model has **18 activities** .	0 min 4 sec
What are the possible start and end activities in my log?	==== Start Activities ==== Turning & Milling - Machine 8: 1 cases start here Round Grinding - Manual: 1 cases start here ==== End Activities ==== Packing: 2 cases end here	- **Start activities** : - Turning & Milling - Machine 8 (1 case starts here) - Round Grinding - Manual (1 case starts here) - **End activity** : - Packing (2 cases end here)	0 min 7 sec	==== Start Activities ==== Turning & Milling - Machine 5: 4 cases start here Turning - Machine 5: 1 cases start here Turning & Milling - Machine 4: 1 cases start here ==== End Activities ==== Packing: 3 cases end here Final Inspection Q.C.: 2 cases end here Round Grinding - Machine 3: 1 cases end here	- **Start activities** : - Turning - Machine 5 (1 case starts here) - Turning & Milling - Machine 5 (4 cases start here) - Turning & Milling - Machine 4 (1 case starts here) - **End activities** : - Packing (3 cases end here) - Final Inspection Q.C. (2 cases end here)	0 min 11 sec
Which activity is the happened before and after activity X?	- Turning & Milling Q.C. -> Laser Marking - Machine 7 - Final Inspection Q.C. -> Laser Marking - Machine 7 - Laser Marking - Machine 7 -> Flat Grinding - Machine 11 - Laser Marking - Machine 7 -> Packing	- **Before** : Turning & Milling Q.C., Final Inspection Q.C. - **After** : Flat Grinding - Machine 11, Packing.	0 min 5 sec	Turning - Machine 5 -> Turning & Milling - Machine 5 Turning Q.C. -> Turning & Milling - Machine 5 Turning & Milling Q.C. -> Turning & Milling - Machine 5 Turning - Machine 5 -> Turning & Milling - Machine 5 Turning & Milling - Machine 5 -> Turning & Milling - Machine 4 Turning & Milling - Machine 5 -> Turning & Milling Q.C.	**Before** : Turning Q.C., Turning & Milling - Machine 5, Turning & Milling Q.C., Turning - Machine 5 - **After** : Turning Q.C., Turning & Milling - Machine 4, Turning & Milling - Machine 5, Turning & Milling Q.C., Laser Marking - Machine 7	0 min 9 sec

				Turning & Milling - Machine 5 -> Turning Q.C. Turning & Milling - Machine 5 -> Laser Marking - Machine 7		
Which activities have instances of rework?	==== Rework Cases Per Activity ==== Turning & Milling - Machine 8: 1 cases with rework Turning & Milling Q.C.: 1 cases with rework Final Inspection Q.C.: 1 cases with rework Round Grinding - Manual: 1 cases with rework	- Turning & Milling Q.C. - Final Inspection Q.C. - Round Grinding - Manual - Turning & Milling - Machine 8	0 min 7 sec	==== Rework Cases Per Activity ==== Lapping - Machine 1: 6 cases with rework Turning & Milling - Machine 5: 5 cases with rework Round Grinding - Machine 3: 5 cases with rework Final Inspection Q.C.: 3 cases with rework Turning & Milling - Machine 4: 2 cases with rework Round Grinding - Q.C.: 2 cases with rework Round Grinding - Machine 12: 2 cases with rework Turning Q.C.: 1 cases with rework Turning & Milling Q.C.: 1 cases with rework Laser Marking - Machine 7: 1 cases with rework Round Grinding - Machine 2: 1 cases with rework Turning - Machine 5: 1 cases with rework Round Grinding - Manual: 1 cases with rework	- Grinding Rework - Machine 12 - Round Grinding - Machine 2 - Turning Q.C. - Round Grinding - Manual - Turning - Machine 5	0 min 9 sec
Process-based context						
What transitions take the highest average time and its frequency?	Round Grinding - Manual -> Final Inspection Q.C. (frequency = 1, performance = 637140.00 seconds = 7 days 8 hrs 59 mins)	- - **Highest average time**: "Round Grinding - Manual → Final Inspection Q.C." (7 days 8 hrs 59 mins). - **Frequency**: 1.	0 min 9 sec	Round Grinding - Q.C. -> Round Grinding - Machine 3 (frequency = 1, performance = 2337840.00 seconds = 27 days 1 hrs 24 mins)	- **Highest average time**: "Round Grinding - Q.C. → Round Grinding - Machine 3" (27 days 1 hrs 24 mins). Frequency: 1 (lowest among 43 transitions).	0 min 11 sec
What are the main bottlenecks in the process?	Round Grinding - Manual -> Final Inspection Q.C. (frequency = 1, performance = 637140.00 seconds = 7 days 8 hrs 59 mins)	- **Main bottleneck**: "Round Grinding - Manual → Final Inspection Q.C." - Average execution time: 7 days 8 hrs 59 mins (longest in the process). - Frequency: 1 (lowest among 13 transitions). - Note: Slowest transition, likely causing delays in overall process flow.	0 min 12 sec	Round Grinding - Q.C. -> Round Grinding - Machine 3 (frequency = 1, performance = 2337840.00 seconds = 27 days 1 hrs 24 mins)	- **Main bottleneck**: "Round Grinding - Q.C. → Round Grinding - Machine 3" - Average execution time: 27 days 1 hr 24 mins (longest) - Frequency: 1 (lowest among 43 transitions)	0 min 13 sec

Which transition contain self-loops?	<p>=== Self-loop Transitions (A -> A) ===</p> <p>Total number of unique self-loop transitions: 4</p> <p>Turning & Milling - Machine 8 -> Turning & Milling - Machine 8: 8 times</p> <p>Turning & Milling Q.C. -> Turning & Milling Q.C.: 1 times</p> <p>Final Inspection Q.C. -> Final Inspection Q.C.: 2 times</p> <p>Round Grinding - Manual -> Round Grinding - Manual: 3 times</p>	<p>- **Final Inspection Q.C. -> Final Inspection Q.C.** (self-loop, 2 times)</p> <p>- **Round Grinding - Manual -> Round Grinding - Manual** (self-loop, 3 times)</p> <p>- **Turning & Milling - Machine 8 -> Turning & Milling - Machine 8** (self-loop, 8 times)</p> <p>- **Turning & Milling Q.C. -> Turning & Milling Q.C.** (self-loop, 1 time)</p>	0 min 7 sec	<p>=== Self-loop Transitions (A -> A) ===</p> <p>Total number of unique self-loop transitions: 10</p> <p>Turning & Milling - Machine 4 -> Turning & Milling - Machine 4: 7 times</p> <p>Round Grinding - Machine 3 -> Round Grinding - Machine 3: 6 times</p> <p>Turning & Milling - Machine 5 -> Turning & Milling - Machine 5: 9 times</p> <p>Round Grinding - Machine 2 -> Round Grinding - Machine 2: 3 times</p> <p>Round Grinding - Q.C. -> Round Grinding - Q.C.: 3 times</p> <p>Lapping - Machine 1 -> Lapping - Machine 1: 5 times</p> <p>Final Inspection Q.C. -> Final Inspection Q.C.: 5 times</p> <p>Turning - Machine 5 -> Turning - Machine 5: 1 times</p> <p>Round Grinding - Machine 12 -> Round Grinding - Machine 12: 4 times</p> <p>Round Grinding - Manual -> Round Grinding - Manual: 5 times</p>	<p>- Turning - Machine 5 -> Turning - Machine 5</p> <p>- Round Grinding - Machine 2 -> Round Grinding - Machine 2</p> <p>- Lapping - Machine 1 -> Lapping - Machine 1</p> <p>- Round Grinding - Machine 3 -> Round Grinding - Machine 3</p> <p>- Round Grinding - Manual -> Round Grinding - Manual</p>	0 min 8 sec
Where am I wasting the most time in the process?	<p>Round Grinding - Manual -> Final Inspection Q.C. (frequency = 1, performance = 637140.00 seconds = 7 days 8 hrs 59 mins)</p>	<p>- The slowest transition is **Round Grinding - Manual -> Final Inspection Q.C.** with an average execution time of **7 days 8 hrs 59 mins**, making it the primary time-waster.</p> <p>- This transition has the **lowest frequency** (1 occurrence) among 13 transitions, indicating it is a bottleneck.</p>	0 min 7 sec	<p>Round Grinding - Q.C. -> Round Grinding - Machine 3 (frequency = 1, performance = 2337840.00 seconds = 27 days 1 hrs 24 mins)</p>	<p>- **Waste in "Round Grinding - Q.C. -> Round Grinding - Machine 3":</p> <p>- **Average execution time**: 27 days 1 hrs 24 mins (longest in the process).</p> <p>- **Frequency**: 1 (lowest among 43 transitions).</p> <p>- **Bottleneck**: Longest duration, causing significant time waste despite low frequency.</p> <p>**Key Insight**: The most time wasted is in "Round Grinding - Q.C. -> Round Grinding - Machine 3" due to its extreme execution time, even though it occurs infrequently.</p>	0 min 11 sec
Which are the highest and lowest transitions on	<p>Round Grinding - Manual -> Final Inspection Q.C. (frequency = 1, performance</p>	<p>- **Highest average time**: Round Grinding - Manual -></p>	0 min 15 sec	<p>Round Grinding - Q.C. -> Round Grinding - Machine 3 (frequency = 1, performance</p>	<p>- **Highest average time**: "Round Grinding - Q.C. -> Round Grinding - Machine 3"</p>	0 min 16 sec

average time and how frequent are they?	= 637140.00 seconds = 7 days 8 hrs 59 mins) Final Inspection Q.C. -> Laser Marking - Machine 7 (frequency = 1, performance = 4380.00 seconds = 1 hrs 13 mins)	Final Inspection Q.C. (7 days 8 hrs 59 mins), frequency: 1. - **Lowest average time**: Final Inspection Q.C. → Laser Marking - Machine 7 (1 hr 13 mins), frequency: 1. - All listed transitions have a frequency of 1, which is the lowest among 13 transitions.		= 2337840.00 seconds = 27 days 1 hrs 24 mins) Lapping - Machine 1 -> Round Grinding - Manual (frequency = 1, performance = 960.00 seconds = 16 mins)	(27 days 1 hrs 24 mins). Frequency: 1. - **Lowest average time**: "Turning & Milling Q.C. → Turning Q.C." (26 mins). Frequency: 1. - **Highest average time**: - **Round Grinding - Q.C. → Round Grinding - Machine 3** (27 days 1 hr 24 mins) - **Frequency**: 1 - **Lowest average time**: - **Lapping - Machine 1 → Round Grinding - Manual** (16 mins) - **Frequency**: 1 All listed transitions have the lowest frequency (1) out of 43.	
Variant-based context						
How many variants are there in the process?	Total number of variants: 2	There are 2 variants in the process.	0 min 2 sec	Total number of variants: 6	- 6 variants.	0 min 5 sec
Which cases followed the shortest path?	Variant 1: Round Grinding - Manual → Round Grinding - Manual → Round Grinding - Manual → Final Inspection Q.C. → Laser Marking - Machine 7 → Packing Number of activities in path: 7 Cases: 1 Case IDs: Case 58	- Case 58 followed the shortest path (7 activities).	0 min 6 sec	Variant 2: Turning & Milling - Machine 5 → Turning & Milling - Machine 5 → Turning & Milling Q.C. → Laser Marking - Machine 7 → Lapping - Machine 1 → Round Grinding - Machine 23 → Round Grinding - Q.C. → Round Grinding - Machine 3 → Lapping - Machine 1 → Lapping - Machine 1 → Lapping - Machine 1 → Round Grinding - Machine 3 → Final Inspection Q.C. → Final Inspection Q.C. → Packing Number of activities in path: 15 Cases: 1 Case IDs: Case 24 Distinct activities: Final Inspection Q.C., Lapping - Machine 1, Laser Marking - Machine 7, Packing, Round Grinding - Machine 23, Round Grinding - Machine 3, Round Grinding - Q.C.,	- Case 24	0 min 9 sec

	<p>Marking - Machine 7 → Flat Grinding - Machine 11 → Final Inspection Q.C. → Final Inspection Q.C. → Final Inspection Q.C. → Packing</p> <p>Number of activities in path: 19</p> <p>Cases: 1</p> <p>Case IDs: Case 103</p> <p>Avg duration: 744120.00 seconds (8 days 14 hrs 42 mins)</p>			<p>Variant 5: Turning & Milling - Machine 5 → Turning & Milling - Machine 5 → Turning & Milling - Machine 5 → Turning & Milling Q.C. → Turning & Milling - Machine 5 → Turning & Milling Q.C. → Laser Marking - Machine 7 → Deburring - Manual → Flat Grinding - Machine 11 → Lapping - Machine 1 → Round Grinding - Machine 2 → Round Grinding - Machine 2 → Round Grinding - Q.C. → Round Grinding - Q.C. → Lapping - Machine 1 → Lapping - Machine 1 → Round Grinding - Machine 2 → Round Grinding - Machine 2 → Round Grinding - Machine 2 → Final Inspection Q.C. → Final Inspection Q.C. → Laser Marking - Machine 7 → Grinding Rework - Machine 12 → Final Inspection Q.C. → Final Inspection Q.C. → Packing</p> <p>Number of activities in path: 26</p> <p>Cases: 1</p> <p>Case IDs: Case 122</p> <p>Distinct activities: Deburring - Manual, Final Inspection Q.C., Flat Grinding - Machine 11, Grinding Rework - Machine 12, Lapping - Machine 1, Laser Marking - Machine 7, Packing, Round Grinding - Machine 2, Round Grinding - Q.C., Turning & Milling - Machine 5, Turning & Milling Q.C.</p> <p>Avg duration: 2030580.00 seconds (23 days 12 hrs 3 mins)</p>	
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