Optimizing Incident Management in Telecommunications Networks through the Integration of Artificial Intelligence

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Abstract. *For the field of telecommunications, the artificial intelligence (AI) has revolutionized the way of networking, due to improved scalability, reliability and efficiency networks. This research provides an insight into the role of artificial intelligence in telecom companies concentrating on its effectiveness on cost reduction, service quality, and network performance analysis. As traditional network growth they are seeing in customer demand for faster issue resolution and better management solutions. Artificial intelligence is one of the key enablers with the help of lowering the cost of operation and decreased energy usage while reducing the reliance on redundant manual actions.*

Involving objectifying the incident resolution in Bizagi by using simulations of two types of scenarios including artificial intelligence and scenario excluding the artificial intelligence. These scenarios were assessed both on cost, throughput and resource usage. Respondent level data were also collected from a survey that was administered to staff, supported the findings of the case study, data were analysed using Pearson and Tests of the equivalence of the proportions were performed via Chi-square tests in IBM SPSS Statistics. The simulation results reveal that AI based schemes improve the network resource consumption and we also find that energy consumption. speed up customer response times and improve demand management at peak times. Moreover, the incorporation of AI helps telecom companies to foreknow the issues in the service to effectively prevent the future failures. AI adopting plays important in telecom. This paper draws attention to the transformative power of artificial intelligence in sensing achiever in the engineering.

Further, a questionnaire that were completed by with the company's employees helped support the case study results whose analysis was done with Pearson and Chi-square analyses in IBM SPSS Statistics. The findings show that AI- enabled methods maximize network resources and maximize the inflation function. speedup customer reply times but also improve demand management in peak time. Moreover, the The embedded AI integration allows telecom operators to predict and prevent potential failures and hence Reduce the both downtime and downtime. reducing disruptions. This paper emphasizes the important power of artificial intelligence to process telecommunication optimization, which may provide useful for the companies who wish to increase functioning effectiveness and enhance customer satisfaction.

Keywords: artificial intelligence, telecom, network, performance.

Introduction

Artificial intelligence (AI) has revolutionized many sectors and telecommunications is not an

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exception. Over the past few years, more and more companies, both in the US and across the world, have started implementing AI to improve communications, introduce a customer relationship management and operate it. Emulating human as data analysis, customer research and media monitoring. And decision making,reducing the need for human intervention, and enhancing overall operational efficiency.

Telecommunications are the basic medium through which data is constantly transferred, voice, and multimedia over the worldwide digital infrastructure. Doubtless, as the requirements of customers for dependable and performance increase, network optimization has become a top concern for service providers. Network optimization can lead to better customer experience and satisfaction spurred in part by improved performance efficiency, and automation. These improvements can be realized by efficient assignment and use of digital era, while utilizing network resources more efficiently, cutting costs and staying ahead in a period of digital evolution. AI, as well as enabling technologies like chatbots, 5G, cloud computing, predictive data analytics, and machine learning (SDRL) plays a significant role in revolution of telecommunications by improving user services, network operation optimization, digital fraud prevention, faster more efficient solutions.

As Telecommunications systems are deployed, the required speed of fault diagnose is increased and the networks become more. urgency, this research addresses the research question: *"To what degree does artificial intelligence surpass conventional methods in improving the efficacy and efficiency of incident management in telecommunications?"*. To address this question, the work takes a strict mixed-methods position, integrating the grounding of process modeling with. comparison), statistical analysis for assessing the effect of AI on cost reduction, acceleration in response time, and improvement of service reliability. These process contain provisions for quick detecting of faults, diagnosis of their causes and prompt correcting of all such problems. reasons and fixes, so that the damage to services is minimized and there is less downtime. n this regard, conventional management mechanisms have too commonly remained ineffective in the presence of the growingly complicated the sense of urgency and rapid response, and this also lead to novel solutions applied including the use of the and AI features integration.

This paper studies the impact of artificial intelligence on process optimization in a telecom enterprise. The multi-method research utilizes process modeling using Bizagi, scenario simulation with and without AI application and quantitative analysis of employee survey data with Pearson and Chi-square test in IBM SPSS Statistics.

Key theme areas comprise: cost cutting by introduction of automation and efficiency, network performance boosting by use of less outages and better monitoring of the network.
The results provide a detailed understanding of the transformative power of AI.

Literature review

AI has attracted wide attention in the field of telecommunication, trying to provide solutions to various network issues. AI methods are incorporated for fault detection, predictive maintenance and real time analytics, resulting in less downtime, and more productivity. Yet, in contrast to this increasing research literature about the AI-powered automation, but less attention is paid to its direct effect on incident resolution efficiency. AI models are now commonly used to identify suspicious network behavior, predict impending failures, and automate maintenance works (Md. Rashel Mia & Jeff Shuford, 2024).

While such capabilities enhance the overall resilience of networks, there is a lack of research on how AI helps in taking real-time decisions for solving network events and service degradations.(Gopalakrishna Karamchand, 2024) Cost effectiveness and effect on operations by applying AI in the telecommunications sector has also been thoroughly researched.

While this study illustrates AI's impact on network optimization, investigating its use in incident resolution strategy, in particular when dealing with unexpected sources of errors and decision-making processes in an automated manner. AI-driven automation has already proven its worth in network incident response, and accelerated the time it takes to troubleshoot the problem and maintain service reliability (Williams & Natarajan, 2023).

AI adoption in telecom operations is known to have a profound impact on workforce dynamics, where it lowers tedious manual involvement in everyday tasks as well as enabling staff to concentrate on more abstract problem- solving tasks (Liu & Fernandez, 2022). Anomaly detection in telecom networks is the subject of another pertinent field of study. The detection of anomalous network traffic patterns has been greatly enhanced by AI-based deep learning models, enabling proactive fault management and early threat detection (Enerst Edozie & Aliyu, 2024). Even though these developments help prevent incidents, more empirical study is required to determine how AI-driven tools can actively contribute to incident resolution in ways other than fault detection.

Although previous research recognizes AI's potential in cost reduction, network automation, and predictive analytics, the precise effect of AI on incident resolution effectiveness is still not well understood. Few studies look at AI's role in speeding up troubleshooting; most research has concentrated on how it improves network monitoring and proactive fault prevention. Despite the recent advances\ in AI-based network automation, little empirical work has investigated the potential of AI's with incident response, compared to traditional telecom troubleshooting practice. Most research has delved into predictive ability and cost savings, quantitative examination on the direct.forces of AI adoption has been scarce reducing response time, speeding up service recovery, and allocating resources in incident handling workflows. The current work attempts to fill this gap by: Evaluating AI powered incident management over traditional troubleshooting methods.

By bridging this gap, this study aims to provide additional insights into how AI can be transformational in enhancing management process and offers to telecom carriers valuable experiences on the utilization of AI to improve service assurance and operational efficiency.

Methodology

As a telecom engineer, I've seen firsthand the challenge of manual incident, such as long time to resolution, ineffective resource allocation, and exorbitant operating expenses. In order to thoroughly examine how artificial intelligence improves the effectiveness of fault detection, diagnosis, and resolution in network operations, this study uses a mixed-methods approach.

This study develops two main research hypotheses based on a thorough literature review and preliminary empirical observations:

Hypothesis 1: By automating repetitive tasks, reducing manual intervention, and optimizing the use of human resources, AI integration in incident management dramatically lowers operational costs. The second hypothesis states that proactive monitoring and quick incident resolution are two ways AI increases network reliability.

Simulation Framework

To provide a practical evaluation of AI's role in incident management, the study integrates

process modeling, simulation-based analysis, and statistical validation.
Key parameters were selected based on real operational data and best practices in telecommunications engineering:

Mean Time to Detect (MTTD): The typical amount of time needed to find errors.
The entire amount of time from detection to resolution is known as the Mean Time to Repair (MTTR).

Cost metrics: Including expenses for operations.
The simulation's AI model was made to: Automate the creation of tickets and categorize incidents according to their level of severity.
Sort faults based on network stability and customer impact.

Allocating resources as efficiently as possible while minimizing manual interventions.

Bizagi, a tool for process visualization and optimization, was used to map and model the incident management workflow. The process includes:
- The operational workflow is started by incident detection (start event).
- Support ticket creation (AI vs. manual): AI automation lowers processing expenses and time.
- AI outperforms humans in fault identification and prioritization when it comes to incident classification.
- Finding the underlying cause and raising the issue when required is known as fault diagnosis and escalation.
- Field technicians or remote solutions are in charge of technical intervention, whether it be local or remote.
- MTTR is directly impacted by incident resolution and ticket closure.
- Artificial intelligence (AI) streamlines the creation and prioritization of tickets, guaranteeing that critical events—like infrastructure failures—are reported to field teams right away, while less serious problems are handled remotely or require additional investigation.

Simulation and Verification of the Effects of AI
Two scenarios were simulated in order to measure the impact of AI:
- Conventional Method: Network faults are manually identified, diagnosed, and fixed by engineers.
- AI-Integrated Approach: AI automates prioritization and fault detection.
- The simulation was conducted for 200 replications in Bizagi Modeler with a fixed seed value (12345) for reproducibility, guaranteeing statistically sound outcomes. It's also critical to remember that the operational procedures previously discussed were determined by a particular Mean Time to Repair (MTTR), Mean Downtime to Repair (MDDTR), and related expense.
- Twenty engineers, fifteen technicians, and ten specialists were assigned fixed costs and hourly rates (technician: 50 RON/h, specialist: 70 RON/h, engineer: 60 RON/h) in order to model resource availability based on operational realities. The automated classification provided by AI greatly shortened intervention times and enhanced resources.

Verification Using Empirical Analysis:
- A structured survey was administered to 102 network operations staff members in order to further validate the findings. Perceived efficiency gains in incident management with AI

support were evaluated by the survey.
- Workforce impact, analyzing changes in task distribution.
- Network reliability metrics, including downtime reduction and service continuity.
- Statistical analysis (using IBM SPSS Statistics) was performed using: Pearson's Correlation Test to assess AI's relationship with key performance indicators.
- To compare resolution rates under conventional versus AI-driven approaches, use the Chi-Square Test.

Issues and Things to Think About When Using AI
Even though AI automates incident management, there are still issues, such as possible misclassification, biases in the data, and the requirement for constant improvement. For AI to effectively support human expertise in decision-making rather than replace it, high-quality data, infrastructure investment, and workforce training are necessary.

Results and discussions
I have divided the paper into three primary sections to demonstrate the effects of incorporating AI into network incident management:
- the Bizagi-modeled processes;
- the simulation outcomes;
- the data analysis from the questionnaire.

First, I used Bizagi to map the network incident management process, which explains all the steps involved, from quickly identifying faults to diagnosing and, if necessary, intervening.
Incident volume and types: Modeled using historical network logs, categorizing faults by frequency and severity

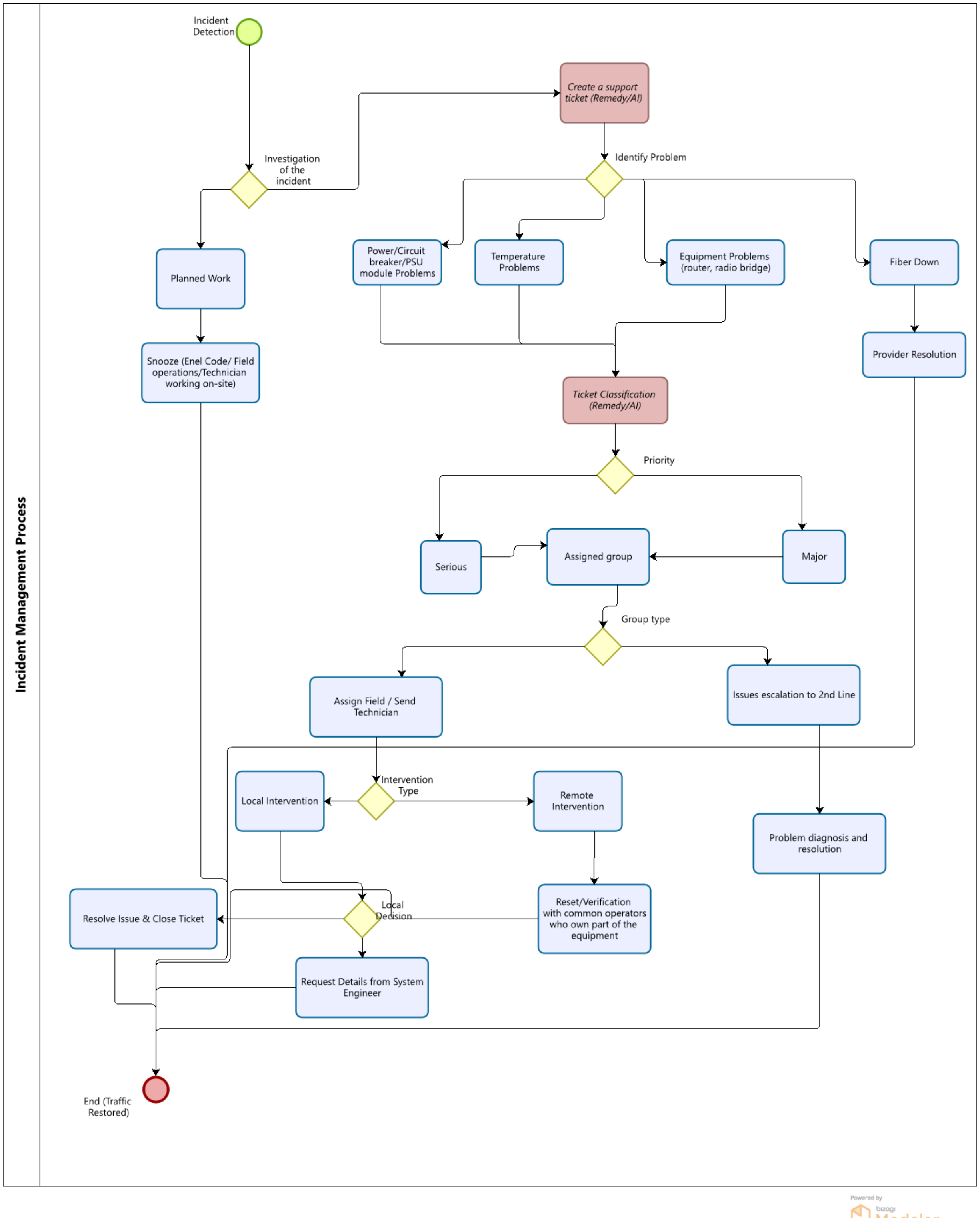

Figure 2. The modeling of the Network Incident Management Process

Source: Authors' own research.

The diagram technically presents the main stages involved in network incident management, from initial detection to final resolution and closure.

A preliminary investigation and the creation of a support ticket for recording and documenting the incident come after the automatic or manual identification of an incident. The incident is then categorized according to its type and severity through a thorough analysis, which establishes the operational workflow that follows: the decision between an onsite intervention and a remote resolution.

The figure above shows the key stages of an incident management process. First is the tagging and incident analysis, then creation or search for a ticket. Finding and analyzing the incident comes first, then either creating a new ticket or looking for one that already exists. The incident is then given a priority (serious or major) and categorized by type (power/circuit breaker/psu module issues, equipment issues, fiber outage, temperature issues, etc.). The right team is assigned to the incident based on its priority and root cause, and they can take local or remote action. It is forwarded to the next support level if required. The ticket is closed and the process resumes its regular operating state once the problem has been fixed.

Table 1.The values of the parameters used in the simulation for the manual scenario versus the AI

Activity	Average Duration	Cost per Minute (RON)	Allocated Resources
Incident Detection (Start Event)	0 min	0	N/A
Planned Work	5 min	1.00	1 (engineer)
Snooze (Enel Code / Field Ops)	2 min	2.0	1 (engineer)
Create a Support Ticket (Remedy)	15 min	1.50	1 (engineer)
Create a Support Ticket (AI)	3 min	0.30	0(automation)
Ticket Classification (Manual Automated)	12 min	2.00	1 (engineer)
Ticket Classification (AI Automated)	2 min	0.20	0 (automation)
Power/Circuit Breaker/PSU Problems	1 min	1.00	1 (engineer)
Temperature Problems	6 min	0.80	1 (engineer)
Equipment Problems (router, radio bridge)	5 min	0.90	1 (engineer)
Other Problems	6 min	0.70	1 (engineer)
Fiber Down	4 min	1.00	1 (engineer)
Provider Resolution	20 min	2.00	1 (specialist)
Assign Field / Send Technician	5 min	1.00	1 (engineer)
Problem diagnosis and resolution	50 min	1.00	1 (engineer)
Issues escalation to 2nd Line	15 min	1.00	1 (engineer)
Local Intervention	80 min	2.00	1 (technician)
Remote Intervention	25 min	3.00	1 (technician)
Request Details from System Engineer	8 min	1.00	1 (engineer)
Resolve Issue & Close Ticket	60 min	2.00	1(technician)

This study compares two distinct scenarios for executing a network incident management process:

1. *Manual Scenario*: In this approach, problem identification and ticket classification are performed manually by operators and technicians.

2. *AI Automated Scenario*: These activities are automated using AI algorithms, significantly reducing execution times – for instance, " Create a Support Ticket" takes 3 minutes, and "Ticket Classification" only 2 minute.

Table 2. Simulation of the scenario with the integration of artificial intelligence in company

Name	Type	Instances completed	Insta	Min.	Max. time (m)	Avg. time (m)	Total time (m)	Max. ti		Avg. time waiting fo	Standard deviation	Total ti	Total fix
Incident Management Process	Process	200	200	9	277	97.27	19454					9826	10621
Incident Detection	Start event	200											
Investigation of the incident	Gateway	200	200										
Planned Work	Task	49	49	6	27	13.4897959183673	661	21		7.48979591836735	5.8662731936759	367	490
Snooze (Enel Code/ Field operations/Technician working on-site)	Task	49	49	3	26	11.5918367346939	568	23		8.59183673469388	7.00995900115216	421	980
Create a support ticket (Remedy)	Task	151	151	2	2	2	302	0		0	0	0	453
Identify Problem(AI Automated)	Gateway	151	151										
Power/Circuit breaker/PSU module Problems	Task	31	31	2	2	2	62	0		0	0	0	31
Temperature Problems	Task	35	35	2	2	2	70	0		0	0	0	35
Ticket Classification (AI Automated)	Task	106	106	5	5	5	530	0		0	0	0	212
Assign Field / Send Technician	Task	64	64	7	30	14.796875	947	23		7.796875	7.35097716187277	499	1280
Intervention Type	Gateway	64	64										
Local Intervention	Task	44	44	34	122	85.2727272727273	3752	88		51.2727272727273	30.5958728918874	2256	880
Local Decision	Gateway	44	44										
Request Details from System Engineer	Task	13	13	11	34	17.8461538461538	232	23		6.84615384615385	8.68992479250588	89	130
Resolve Issue & Close Ticket	Task	31	31	45	124	89.8709677419355	2786	89		54.8709677419355	23.3441875551895	1701	620
Remote Intervention	Task	20	20	27	113	75.1	1502	86		48.1	28.1458700345184	962	600
End (Traffic Restored)	End event	200											
Fiber Down	Task	45	45	5	28	12.7555555555556	574	23		7.75555555555556	6.4399984663751	349	450
Provider Resolution	Task	45	45	12	12	12	540	0		0	0	0	900
Equipment Problems (router. radio bridge)	Task	40	40	6	30	13.1	524	24		7.1	7.00285656000464	284	400
Priority (AI Automated)	Gateway	106	106										
Serious	Task	72	72	5	5	5	360	0		0	0	0	720
Major	Task	34	34	5	28	14.8823529411765	506	23		9.88235294117647	7.35552895639557	336	340
Issues escalation to 2nd Line	Task	42	42	16	103	66.6190476190476	2798	87		50.6190476190476	27.8490423712869	2126	420
Problem diagnosis and resolution	Task	42	42	34	57	41.0476190476191	1724	23		7.04761904761905	7.71193379785475	296	420
Reset/Verification with common operators who own part of the equipm	Task	20	20	12	36	19	380	24		7	7.72010362624751	140	200
Assigned group	Task	106	106	6	6	6	636	0		0	0	0	1060
Group type	Gateway	106	106										

Source: Authors' own.

In the simulation, the following probabilities were set: For Investigation Options, 20% of cases involved planned work (plannedWork == true) and 80% involved creating a support ticket (plannedWork == false). In the Identify Problem phase, the distribution of issue types was equally divided, with 20% for power, 20% for temperature, 20% for equipment, 20% for external alarms, and 20% for fiber down. For the Intervention Type, 60% of incidents were assigned to local intervention (interventionType == 'local') and 40% to remote intervention (interventionType == 'remote').

Cost analysis and resource utilization were the two main components that the simulation was intended to assess. Clear insight into the financial impact of each scenario was provided by the cost analysis, which concentrated on quantifying operational savings attained by cutting execution times. The evaluation of resource utilization concurrently tracked shifts in the distribution of personnel (technicians, operators) between the two scenarios, exposing disparities in operational effectiveness and highlighting the benefits of integrating AI.

Table 3. Scenario without AI

Simulation Results

Resources

Incident Management Process

Scenario information

Name	Resolution Problem (Manual)
Description	Identify Problem
Time unit	Minutes
Duration	000,08:00:00

Resource	Utilization	Total fixed cost	Total unit cost	Total cost
Technician	47.17 %	1,560	1,886.67	3,446.67
Specialist	4.83 %	1,160	406	1,566
Engineer	98.65 %	21,040	6,156	27,196
	Total	23,760	8,448.67	32,208.67

Export to Excel Print

Source: Authors' own.

Table 4. Scenario with AI

Simulation Results

Resources

Incident Management Process

Scenario information

Name	Resolution Problem (AI)
Description	Identify Problem
Time unit	Minutes
Duration	000,08:00:00

Resource	Utilization	Total fixed cost	Total unit cost	Total cost
Technician	79.02 %	4,110	3,160.83	7,270.83
Specialist	7.50 %	1,800	630	2,430
Engineer	62.10 %	15,040	3,875	18,915
	Total	20,950	7,665.83	28,615.83

Export to Excel Print

Source: Authors' own.

When AI is used to optimize network incidents, the overall cost comes to about 28,615.83 units, as opposed to 32,208.67 units when engineers use Remedy to process tickets manually.

The efficiency attained by implementing AI in 8 hours for a maximum of 200 detected incidents is demonstrated by the difference of 3,592.84 units, which translates to a cost reduction of roughly 11.15%.

AI can filter and resolve incidents by automating the process, which frees engineers from tedious work and enables them to concentrate on more complicated problems. As a result, resources are significantly optimized and operating costs are significantly reduced, giving the support network a significant strategic advantage.

Cost reduction per shift: 3,592.17 units

Annual cost reduction: 3,592.84 × 250 = 898,042.21 units (250 workdays in a year) (1 units =1 USD).

3,592.84 USD / 4.5 = 798.40 RON (for a shift/8 hours)

798.40 RON × 250 =199,600 RON (for a year)

Table 5. Allocated resources with AI and without AI

Indicator	Manual Process	AI Integration
Total cost per shift	32,208 units	28,615 units
Cost reduction per shift	3,592.84 units/798.40 Ron	
Annual cost reduction (RON)	898,042.21 units/199,600 Ron	
Percentage of resources allocated to engineers	98.65%	62.10%
Technician utilization	47.17%	79.02%

Source: Authors' own.

Furthermore, AI integration in incident management has led to a marked improvement in the utilization of human resources.

Additionally, the use of human resources has significantly improved as a result of AI integration in incident management. Engineers made up 98.65% of the total resources used in the manual process, but their share decreased to 96.10% when repetitive tasks were automated. A more effective workforce allocation was made possible by this roughly 37% reduction, which freed engineers from repetitive tasks and allowed them to focus on more challenging issues. As a result, incident management becomes more efficient overall and operational costs are reduced, both of which are critical for maximizing the support network's performance.

The rise in technician utilization from 47.17% to 79.02% points to a realignment of tasks toward more operational roles, which will inevitably speed up ticket resolution and reduce response times to customer issues.

According to the findings, incorporating AI improves resource allocation and lowers operating expenses, which boosts the effectiveness of the incident management procedure as a whole. This paradigm change offers a significant competitive advantage by facilitating quicker response times and better service quality.

The Information Technology Infrastructure Library, or ITIL, is a popular reference framework for incident management in telecommunications. ITIL places a strong emphasis on lowering two crucial metrics for operational effectiveness: MTTD (Mean Time to Detect) and MTTR (Mean Time to Repair). Existing case studies show that manual procedures without AI automation have an average MTTR of 4–6 hours, which renders incident management ineffective as alert volume rises. However, leading telecom companies like AT&T and Vodafone have shown that incorporating AI into incident detection and classification reduces MTTD by 30–50% and operational costs by 15–25%.

The outcomes of my simulation, in comparison, support these patterns by demonstrating an 11.1% decrease in per-shift expenses and an optimization of resource allocation, as evidenced by the engineers' involvement dropping from 98.65% to 62.10% (a 36.55% improvement).

Examples from the industry where AI has been successfully applied lend credence to these findings: After integrating AI for incident classification, BT Group (British Telecom) reported a 20% reduction in resolution time; Vodafone's critical incident prioritization algorithms powered by AI resulted in a 25% decrease in MTTR; and AT&T's operations centers saw a 12% reduction in operating costs.

These figures clearly align with the advancements reported by telecom industry leaders when compared to my simulation results, which showed an 11.1% cost reduction per shift. The study's findings show that AI helps to lower operating costs, increase resource efficiency, and improve network reliability, all of which are in line with industry standards.

The following stage entailed comparing the data collected with a questionnaire given to a sample of 102 company employees in order to gather thorough insights into the integration of AI in network incident management. Important topics covered in the survey included the respondent's role within the organization, professional background in the telecom industry, and opinions on how AI lowers operating expenses and automates tedious tasks. The survey also looked at how AI affected manual labor and the use of human resources, emphasizing the technology's strategic potential for streamlining processes and boosting long-term output.

The table displays participants perceptions of how AI affects decision-making, emphasizing the frequency and proportion of answers they gave. The most noteworthy finding is that 54.3% of respondents think AI has shortened the amount of time needed to make decisions, suggesting that automation and sophisticated analysis speed up the process. Furthermore, according to 26.7% of participants, AI has enhanced decision quality by enabling more thorough analysis, indicating both a process acceleration and increased decision-making precision. However, 11.4% of respondents reported less human input into decision-making, which could be a reflection of both the benefits of automation and worries about losing human control over the procedure. Only 7.6% of participants considered that AI did not have a significant impact.

Table 6. The effects of artificial intelligence

Effects of AI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	2.9	2.9	2.9
	It did not have a significant impact	5	4.8	4.8	7.6
	It improved decision quality through more detailed analysis	28	26.7	26.7	34.3
	It reduced the level of human involvement in decisions	12	11.4	11.4	45.7
	It reduced the time needed to make decisions	57	54.3	54.3	100.0
	Total	105	100.0	100.0	

Table 7. The Chi-square test result related to the advantages of AI and its implementation in daily tasks

Test Statistics

	Tasks_AI implementation	Advantage_AI
Chi-Square	53.882[a]	140.118[b]
df	4	3
Asymp. Sig.	<.001	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.4.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.5.

The results of the Chi-Square test applied between "Tasks_AI Implementation" and " Advantages_AI" indicate a significant relationship ($p < 0.001$) between the two variables, suggesting that perceptions of AI benefits are closely linked to how the technology is implemented.While 76 participants indicated that AI had a major influence on their processes, nearly 48% of respondents chose category 3 (time reduction) for AI implementation, indicating widespread use in operational tasks. These results highlight how crucial it is to deploy AI effectively and widely in order to optimize advantages like lower costs and increased productivity. These findings show that extensive use of the technology can result in a much greater appreciation of its positive impact, underscoring the significance of an effective and widespread implementation of AI to maximize long-term benefits.

Table 8. The Chi-square test result regarding the reduction of operational costs and the automation of repetitive processes

Test Statistics

	AI_reducin g operational costs?	AI_ automating repetitive processes
Chi-Square	52.510[a]	72.059[b]
df	4	2
Asymp. Sig.	<.001	<.001

?

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.4.
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 34.0.

Perceptions of AI's capacity to automate repetitive tasks and lower operating costs are significantly correlated, according to the Chi-Square test ($^2 = 52.510$, $df = 4$, $p < 0.001$). The crucial role of AI in cost optimization is highlighted by the fact that about 75% of respondents who think AI lowers costs also think automation is necessary to achieve these savings. The reliability of the results is further supported by the highly significant p-value (< 0.001), which shows that this relationship is unlikely to be the result of chance. These findings imply that automation powered by AI not only increases productivity but also contributes significantly to long-term cost-cutting plans. By redistributing human resources to higher-value tasks, organizations using AI for process automation may see increases in workforce productivity and financial sustainability.

Table 9. The Pearson test result between the effects of artificial intelligence and the implementation of AI in daily tasks

Correlations

		Effects of AI	Tasks_AI implementation
Effects of AI	Pearson Correlation	1	.256**
	Sig. (2-tailed)		.009
	N	102	102
Tasks_AI implementation	Pearson Correlation	.256**	1
	Sig. (2-tailed)	.009	
	N	102	102

**. Correlation is significant at the 0.01 level (2-tailed).

In the correlation analysis, the results obtained between "Effects of AI" and "AI Task Implementation" indicate a significant but weak to moderate positive correlation. The Pearson correlation coefficient of 0.256 (p = 0.009) confirms the existence of a significant relationship between these two variables. There is a significant relationship between these two variables, as indicated by the Pearson correlation coefficient of 0.256 (p = 0.009). This implies that organizations typically see a greater positive impact from AI as the use of AI-based tasks grows.

Notwithstanding the weak correlation, its statistical significance shows that the adoption of AI affects how effective it is perceived, a factor that may be influenced by factors like the organization's user experience, level of integration, and adoption scale.

Conclusion

In summary, the analysis unequivocally shows that there are major advantages to incorporating artificial intelligence into network incident management. The Bizagi program was used to compare two scenarios: one with and without AI integration. The results showed significant savings in execution times and operational costs. Furthermore, an analysis of a survey given to 102 workers in a telecom company's technical department using the Chi-square test and Pearson correlation showed a strong correlation between the extent of AI implementation and its positive process effects.

The study demonstrates that using AI to optimize network incidents not only lowers operating expenses but also greatly increases productivity. Costs are estimated to decrease by 11.15% when manual processes are replaced with AI-driven solutions. Additionally, AI implementation improves resource allocation by increasing technician utilization from 47.17% to 79.02% and reducing engineer involvement from 98.65% to 62.10%, a 37% decrease. By improving response times and ticket resolution, this strategic reallocation frees up engineers to work on more difficult problems, which eventually improves service quality and gives them a major competitive edge in network support.

Furthermore, by guaranteeing quicker response times and better service quality, AI integration not only increases operational efficiency and lowers costs but also improves customer satisfaction.

By guaranteeing quicker response times and better service quality, the study validates the use of AI for network incident optimization satisfaction. Even though implementing AI comes with a high initial cost, economies of scale and process optimization should eventually result in lower costs.

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