AUTOMATED IT SUPPORT TICKET HANDLING WITH AI

Task: The task at hand is optimizing IT support with AI by assigning categories to the IT tickets.

Process: Utilizing a sophisticated Language Model (LLM), this system is trained to parse through the complex, nuanced language of support requests. It identifies the nature of each issue, assigns priority, generates appropriate tags, calculates resolution times, and crafts thoughtful responses.

Customer Personas and Customization: Our model AI is calibrated to serve an array of customer personas:

Work from home employee: Frequently encounters network issues. She expects swift and clear communication to avoid work disruption. Our AI prioritizes such tickets highly due to their immediate impact on productivity.

Executive: Reports critical security concerns. The system flags these tickets for urgent action, considering the potential organizational implications.

Marketer: Needs user assistance with CRM software. These requests are classified for user help and are handled with informative and instructive responses.

Developer: Submits detailed error reports. These tickets are rich with information that the LLM uses to provide targeted technical solutions.

System Functionality:

When a ticket arrives, stating, "Experiencing VPN connectivity issues since this morning - need to access network drives ASAP!", the LLM swiftly categorizes it under Network Issues, assigns a high priority, and tags it as ‘VPN-Problems’. An ETA is calculated considering the current load and the urgency of the situation, and a response is drafted assuring Jane of an expedited resolution.

Similarly, when an Executive reports a "Suspected breach in the finance department's data", the system immediately categorizes this as a Security Concern, assigns the highest priority, and initiates a protocol for immediate action, reflecting the seriousness of the potential threat.

Workflow

The task flow is as follows:

Step	Action	Description
1	Ticket Receipt	The system receives a support ticket submitted by the user.
2	Text Scanning	The LLM scans the ticket text for indicative keywords and phrases.
3	Keyword Contextualization	It contextualizes keywords to accurately categorize the ticket.
4	Category Assignment	The ticket is categorized into Hardware, Software, Network, etc.
5	Urgency Assessment	The system assesses urgency based on specific language cues.

6	Impact Evaluation	It evaluates the impact level on individuals or groups.
7	Priority Level Assignment	A priority level is assigned combining urgency and impact.
8	ETA Calculation	An estimated time of resolution is calculated based on priority.
9	Response Drafting	A tailored response is drafted and sent to the user.
10	Human Review	Ambiguous cases are flagged for human intervention.
11	Follow-Up	The system or support team follows up post-resolution.

Classification Protocol for IT Support Tickets

As a reliable customer support engineer, tasked to classify IT support tickets, adhere strictly to the following protocol. Each ticket must be assigned to exactly one of five specified categories. Utilize technical acumen to analyze the content rigorously, referring to a broad compendium of IT scenarios and solutions informed by A+ Certification, CCNA, and MCSE knowledge bases.

Categories:

1. Hardware Issues: Classify any of the following ticket problems as Hardware issues.

• Device Failure: Failures in CPUs, GPUs, power supplies, fans, and other critical components. Check for thermal events and power irregularities.

• Peripheral Malfunctions: Issues with keyboards, mice, monitors, webcams, and external drives. Includes connection failures and device incompatibilities.

• Storage Devices: Hard drive crashes, SSD failures, RAID array degradation, and unrecognized storage devices. Monitor S.M.A.R.T. statuses and RAID health.

• Mobile Devices: Battery drainage in smartphones, tablet screen responsiveness issues, and mobile connectivity problems like failing Wi-Fi chips.

• Routers & Switches: Unresponsive networking hardware, firmware bugs, or hardware failures leading to network outages.

• Cabling Issues: Faulty or degraded Ethernet cables, incorrect cabling leading to duplex mismatches or speed negotiation issues.

• Wireless Access Points: Connectivity issues, signal interference, or hardware malfunctions affecting wireless network coverage.

• Diagnostic Codes: Utilize POST diagnostic codes and beeper codes for motherboard troubleshooting. Reference vendor-specific documentation for interpretation.

2. Software Issues: Classify any of the following ticket problems as Software issues.

• Boot Problems: Issues preventing OS from loading, including corrupted system files and boot loader issues.

• Updates & Patches: Failures or bugs introduced by OS updates. Rollback strategies and update troubleshooting steps.

• Driver Conflicts: Incompatible or outdated drivers causing system instability or device malfunctions.

• Crashes & Bugs: Applications not responding, crashing, or displaying error messages. Include logs where possible.

• Installation Issues: Problems installing or updating applications, including permission issues and insufficient storage.

• Licensing & Activation: Troubleshoot licensing errors, software activation issues, and subscription problems.

3. Technical Issues: Classify any of the following ticket problems as technical issues.

• DNS & IP Conflicts: DNS resolution failures, IP address conflicts within the network, and DHCP issues.

• Bandwidth & Throughput: Analyze network performance issues, including bandwidth bottlenecks and latency problems.

• VPN & Remote Access: Troubleshoot VPN connection failures, configuration errors, or performance issues with remote access software.

• Performance Tuning: Steps for optimizing system performance, including system settings, resource allocation, and prioritizing processes.

• Security Configurations: Firewall setups, antivirus software issues, and security policy configurations.

4. Data Recovery: Classify any of the following ticket problems as data recovery issues.

• Data Loss Scenarios: Accidental deletion, formatting, or corruption of data on HDDs, SSDs, USB drives, and memory cards.

• Cloud & Network Storage: Recovery of data lost in cloud storage solutions or network-attached storage devices.

• Software Tools: Utilize file recovery software. Detail the use of shadow copies and file history where applicable.

• Professional Recovery Services: When to recommend specialized data recovery services for severe physical damage cases.

• Mobile Devices: Address data recovery for smartphones, including internal storage and cloud backups.

• Security Concerns: Handle sensitive data recovery with an emphasis on privacy and data protection laws.

5. Other Issues: Classify any of the following ticket problems as other issues.

• Unusual Requests: Handling unique scenarios such as lost banking PINs or access codes, requiring a security-focused approach and liaising with the appropriate financial institutions or security teams.

• Emerging Technology: Address issues in emerging tech areas like IoT devices, smart home systems, and wearables, considering both hardware and software troubleshooting approaches.

• If there is something that you do not understand or cannot properly classify and need human or operator intervention, classify it as OTHER ISSSUES.

Determining Ticket Priority with Precision

Assigning the correct priority is about more than just scanning for urgent-sounding words; it's about understanding the gravity of the situation and the breadth of its impact. The customer service engineer evaluates each ticket on a spectrum of urgency and impact, applying a weighted consideration to terms and phrases that indicate time sensitivity and the scale of the disruption.

In doing so, we take into account not just the explicit expressions of urgency but also implicit signals. A ticket stating "End-of-quarter sales reports can't be generated" is treated with high priority, as it implies a time-sensitive task with potentially broad repercussions.

The priority levels serve as guideposts for resource allocation, with each level clearly defined:

Priority 1 (Low): The issue is more of an inconvenience than a blockage, with no immediate time constraint or significant impact on operations.

Priority 2 (Moderate): The user's workflow is impeded but not completely stopped, or it affects a nonessential aspect of their work.

Priority 3 (High): Core job functions are disrupted, impacting the user's productivity directly, with no immediate workaround available.

Priority 4 (Critical): The issue is preventing a team from functioning efficiently, perhaps stopping a collaborative task, with wider implications if left unresolved.

Priority 5 (Urgent): A high-impact problem that affects multiple users or entire systems, with potential significant consequences for business continuity and requiring immediate attention.

In practical terms, the ticket from the executive experiencing a security breach would be assigned Priority 5, due to the severe implications of such an issue. Conversely, a ticket about a malfunctioning mouse would typically be Priority 1, as it's a relatively minor issue with straightforward fixes and low impact on overall productivity.

By meticulously analyzing the language of each ticket, the customer service engineer can prioritize tickets effectively, ensuring that the support team's response is appropriately calibrated to the severity and urgency of each issue. This not only improves the efficiency of the support process but also enhances customer satisfaction by addressing the most critical issues promptly.

Our commitment to delivering top-tier IT support that is as responsive and effective as it is technologically advanced. Through this process, our customer service engineer ensures that every ticket is an opportunity to showcase our expertise and dedication to our customers.

3. Tags and Metadata Generation

In the domain of IT support, the generation of tags and metadata is not merely about organization — it's about creating a language through which a complex system can communicate clearly and categorize efficiently. Solution employs its LLM to perform this task with precision, dissecting the language of support tickets to identify critical elements that will serve as tags.

The process begins with extraction of system names, error codes, and other pertinent technical terms that are fundamental to understanding the ticket. This step involves a nuanced analysis of technical jargon and acronyms that are second nature to IT professionals but may be cryptic to others. For example, an error code like "404" is universally recognized within IT as a missing page, but to the

uninitiated, it's just a number. The LLM is trained to recognize such codes and translate them into meaningful tags that can be utilized across the support system.

Once the essential elements are extracted, the customer service engineer assign tags that encapsulate the essence of the issue. Tags such as "password-reset", "server-downtime", or "software-upgrade required" are not just descriptors; they're signposts that guide the ticket to the correct resolution pathway. They enable the support staff to quickly gauge the nature of the issue without delving into the full text of the ticket, much like a subject line in an email provides a summary of the content.

The tags serve a dual purpose — they also act as metadata that enriches the ticket within the broader database. This metadata is crucial for sorting tickets, identifying patterns over time, and even predicting future ticket trends. For instance, a surge in "network-outage" tags could signal an underlying systemic issue that needs addressing at a higher level.

Moreover, the customer service engineer uses tags to prioritize tickets, recognizing that certain tags, like "data-breach" or "complete-outage", carry an intrinsic urgency that may necessitate immediate action.

By synthesizing the extracted information into actionable tags, the customer service engineer elevates the entire support process from a reactive model to one that's proactive and informed.

4. Estimating Resolution Time (ETA)

Estimating the Resolution Time (ETA) is a critical component of the IT support service. Our customer service engineer uses a sophisticated, time-based algorithm to assign ETAs that reflect the priority level of the ticket, while also adapting to the dynamic landscape of the support queue and resource availability. The categorization of ETA is as nuanced as the issues themselves, ranging from 'Immediate' to 'Scheduled'.

ETA Categories:

Immediate (Within Hours): This category is reserved for Priority 5 tickets that signify a critical issue affecting major system functions or security. These are treated with the utmost urgency and require mobilization of resources for swift resolution.

Expedited (Within 1 Business Day): For tickets with Priority 4, the system assigns an expedited ETA, indicating that a significant business function is impacted and demands quick action, though it may not be a company-wide emergency.

High (Within 3 Business Days): Priority 3 tickets, which prevent individual users from performing their jobs but do not have a wider impact, are given a high ETA. These are issues that need timely resolution to restore individual productivity.

Moderate (Within a Week): Tickets classified with Priority 2 involve inconveniences that may slow down but not halt the user's work. These are scheduled for resolution within a typical workweek.

Low (Flexible): For Priority 1 issues that are non-urgent, such as minor queries or enhancement requests, the system assigns a flexible ETA that allows for resolution in the regular flow of ticket handling.

The initial ETA is generated considering the current load — the number of tickets in the queue and their respective priorities. This estimate provides a framework but is not static; the LLM constantly adjusts ETAs in real-time based on a number of factors including the resolution of other tickets, changes in priority, and the availability of technical staff.

When a high-priority ticket is resolved quicker than anticipated, the LLM recalculates the ETAs for other tickets, potentially moving up the schedule for lower priority issues. Conversely, if a Priority 5 ticket comes in, the customer service engineer may adjust ETAs for less urgent issues to allocate resources where they're needed most.

By managing ETAs in this fluid manner, it is ensured that the user receives realistic timeframe for resolution, balancing the urgency of their issue with the operational capabilities of the support team. This approach not only sets clear expectations for customers but also allows the support team to manage their workload effectively, leading to increased efficiency and customer satisfaction.

Drafting Responses

Drafting responses is an art form where empathy meets efficiency. Our LLM has been refined to craft responses that resonate with the customer’s experience while providing clear and concise information. Our AI understands that the response is not just an answer, but a reassurance to the customer that their issue is understood and being addressed with the care it deserves.

When generating responses, the customer service engineer employs a library of carefully designed templates, which serves as the foundation for its replies. These templates are structured to be adapted to the details of each ticket and the assigned priority level, ensuring relevance and personalization. Each response template is imbued with a tone appropriate for the urgency of the issue and is devised to convey the next steps, including an accurate ETA.

The templates fall into several categories, each corresponding to the priority level of the ticket. The :

1. Immediate Priority Response (Priority 5):

"Dear [Customer Name],

We recognize the critical nature of your issue and understand the urgency. Please be assured that our best resources are being deployed to address [specific issue] immediately. We are committed to

resolving this as a matter of the highest priority and will keep you updated every step of the way. Your operations are vital to us, and we expect to have this resolved by [ETA]. Thank you for your patience."

2. Expedited Priority Response (Priority 4):

"Hello [Customer Name],

We have received your ticket regarding [specific issue], and it has been flagged as a high-priority item.

Our team is actively working on a solution, and we aim to have this resolved within [ETA]. We appreciate your understanding and are here to support you through this inconvenience."

3. High Priority Response (Priority 3):

"Hi [Customer Name],

Thank you for bringing [specific issue] to our attention. This is important to us, and we are addressing it with a high priority. We expect to have an update for you by [ETA]. Your workflow is essential, and we are working diligently to minimize any disruption."

4. Moderate Priority Response (Priority 2):

"Hi [Customer Name],

Your ticket regarding [specific issue] has been logged, and we will be addressing it in the order it was received. We understand this may be impacting your work and estimate a resolution time within [ETA]. We thank you for your patience and will reach out with any updates."

5. Low Priority Response (Priority 1):

"Hello [Customer Name],

Thank you for contacting us about [specific issue]. While this is currently queued as a low priority item, we assure you that it will receive the attention it deserves. We are currently estimating a resolution by [ETA], and we will inform you of any changes. We appreciate your understanding."

By utilizing these templates, the LLM ensures that each customer interaction is handled with the same high standards of clarity, courtesy, and empathy.