Bug Tracker Analysis – Detailed BA/ICT Report

1. Introduction

Modern IT service management relies heavily on incident and bug tracking systems (e.g., JIRA, ServiceNow) to ensure service continuity, meet SLAs, and deliver customer satisfaction.
This project explores a 20,000-ticket sample (from a Kaggle dataset of ~243k records) spanning Nov 2023 – Jan 2024.
Why this project matters:

- For Business Analysts, bug/incident data reveals process bottlenecks, customer pain points, and opportunities for service improvement.
- For ICT Support, it highlights workload distribution, escalation trends, and areas where knowledge bases or automation can reduce ticket inflow.

The goal is to replicate a BA/ICT-style analysis of incident data, extract actionable insights, and recommend improvements aligned with ITIL and service management practices.

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2. Hypotheses

H1 – Resolver Workload Imbalance

We hypothesised that a small number of resolvers carry most of the workload. In IT service teams, this is common when triage is manual, or workload allocation rules aren't enforced.

H2 – Issue Drivers Concentration

We expected that performance issues and bugs would dominate tickets, reflecting systemic application/service problems rather than isolated incidents.

H3 – Channel Impact on Satisfaction

We hypothesised that interactive channels (App, Phone) yield higher CSAT compared to passive channels (Web, Email). This aligns with customer service literature: human/interactive support often scores higher.

H4 – Lifecycle Inefficiencies

We expected to find a large number of tickets stuck in "in progress" or generic "other," suggesting poor process standardisation. This would highlight the need for workflow redesign in JIRA or similar tools.

H5 – Priority vs Satisfaction Paradox

We hypothesised that High-priority tickets do not guarantee higher CSAT, since urgency may increase pressure on both staff and customers, lowering perceived quality.

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3. Methodology

- Extracted 20,000 random tickets from a Kaggle ITSM dataset (original: 243,000 rows).
- Normalised data: mapped fields (priority, issue_type, resolver, channel, lifecycle, CSAT). - SQL Queries: performed aggregations for classification (by priority, issue type, channel, resolver, variant), temporal analysis (day/hour/weekday), lifecycle distribution, and satisfaction scores.
- Visualisation: produced bar charts and time-series (daily + weekly) in Matplotlib.
- BA/ICT Mapping: aligned lifecycle stages with JIRA workflow states; mapped high-frequency variants to Confluence knowledge base opportunities.

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4. Findings

4.1 Ticket Classification

- Priority: Medium = 9,962 (≈50%), Low = 5,981, High = 4,057.

→ Suggests most tickets are routine, with fewer critical incidents.

- Issue Types: Performance (5,059) + Bugs (4,811) = ~50% of inflow.

→ Indicates systemic technical issues, not just end-user errors.

- Channels: Website = 10,672 (53%), Email = 7,566 (38%), App = 1,191, Phone = 571.

→ Strong reliance on digital channels but raises risk of impersonal service.

- Resolvers: Sam resolved 4,014 tickets (20% of workload). Emma (2,650) and David (2,177) follow. Others <10%.

→ Single point of failure risk. Sam leaving the team = massive SLA breach potential.

- Variants: Variant 3 = 7,770 tickets (39%), Variant 1 = 4,888 (24%).

→ Heavy repeat issues → need for permanent fixes & knowledge base entries.

4.2 Temporal Analysis

- Daily Volume: Average 55–60 tickets/day. Consistent inflow → indicates steady demand, not spikes.
- By Hour: Even distribution across 24 hours (~780–870 tickets per hour). Suggests globalusage or automated systems generating tickets.
- By Weekday: Balanced across week. Small dip on Thursdays (2,677). → Could indicate process slowdowns or staffing gaps.

4.3 Lifecycle Analysis

- “Other” (5,218) + “In Progress” (4,790) = ~50% of tickets.

→ Major process inefficiency: unclear states, weak SLA monitoring.

- Escalations = 1,818 (~9%).

→ Non-trivial. High escalations signal weak L1 resolution or poor triage.

- Closed = 2,710 vs Created = 2,649.

→ Closure rate is balanced, but the “other” category masks real SLA compliance.

4.4 Customer Satisfaction (CSAT)

- Distribution: Scores 3 (6,239) & 4 (6,517) dominate. Polarisation (1 = 2,391, 5 = 2,483) smaller.

→ Customers are “moderately satisfied,” not delighted.

- By Priority: Medium = 3.24, High = 3.21, Low = 3.19.

→ Confirms H5: high priority does NOT improve satisfaction.

- By Channel: App (3.26) and Phone (3.25) > Website (3.22) and Email (3.21).

→ Confirms H3: interactive channels drive slightly better experiences.

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5. Discussion

- JIRA Workflow Mapping: Lifecycle states in dataset mirror JIRA’s default workflow. High“other” values = poor configuration → need to enforce standard transitions.
- Confluence Knowledge Base: Repeated issues (Variant 3, Variant 1) → prime candidates for KB articles, FAQs, or self-service bots.
- SLA Risks: Resolver imbalance (Sam 20%) is dangerous. SLA breach likelihood increases ifhe is unavailable. Automation and workload balancing needed.
- Customer Experience: CSAT is stable but unimpressive. Website/email underperform → need UX improvements (forms, autoreplies, better tracking).

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6. Recommendations

1. Resolver Workload Balancing

- Introduce automatic assignment rules in JIRA.
- Train additional resolvers to reduce dependency on Sam.2. Root Cause Fixes for Performance/Bugs - Establish problem management teams.
- Track incidents to upstream causes and push fixes to engineering.3. Lifecycle Standardisation - Eliminate “other” category.
- Map all tickets to clearly states (Created → Assigned → In Progress → Escalated/Resolved → Closed).

4. Knowledge Base Expansion (Confluence)

- Document Variants 3 and 1 (together ~63% of workload).
- Build self-service knowledge articles.
- Link KB to intake forms to deflect tickets.

5. Improve CSAT

- Focus on Website and Email workflows.
- Add contextual FAQs, SLA countdown timers, status notifications.

6. Escalation Review

- Train L1 agents on common repeat issues.
- Reduce escalations from 9% to <5%.

7. Power BI Dashboard (Visuals packed in image folder)
- KPIs: ticket inflow by channel, SLA compliance, CSAT trends.
- Visual dashboards for leadership.

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7. Conclusion

This analysis demonstrates that even a subset of ITSM data (20k tickets) can reveal actionable insights for ICT and BA practice. By applying SQL, Python, and BA frameworks, we identified:
- Heavy reliance on a few resolvers (risk).
- Performance/Bug dominance (~50%).
- Weak process design (high “other” stage).
- Moderate CSAT, with interactive channels outperforming web/email.

Outcome: This project shows capability to combine data analysis + BA/ICT frameworks to deliver insights, recommendations, and industry-standard outputs (KPIs, visuals, reports).