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Ticket Analytics by an AMS Team to Assess Applications Deficiencies

Biswadeb Bandyopadhyay
Assistant Professor, Department of Computer Science and Engineering
University of Engineering and Management, Kolkata
E-Mail : biswadeb.bandyopadhyay@uem.edu.in
Mobile: +91-9903052768

1. Introduction

The paper discusses a Ticket Analytics undertaken by an Application Maintenance and Support (AMS) team engaged in providing end to end Application Maintenance and Support services of large number of applications performing a host of operational, tactical and strategic functions of the organization. The team has been providing AMS support of these applications for the last two years very efficiently with almost 100% compliances of all applicable SLAs. The team gained considerable knowledge of the applications and have been credited with solving some of the most critical and challenging production problems. Client has expressed their deep appreciation of the work being done by the AMS team from time to time.

However, client has of late expressed a desire to know more about nature of production incidents and have a better understanding of these applications in terms of their nature of defects to unearth certain fundamental characteristics of these applications. Client therefore wanted the AMS team to delve into the defects that have uncovered so far and carry out a comprehensive analysis of those defects (production incidents) to bring out certain very fundamental characteristics of those applications in terms of nature of future problems they may throw up in their operational life. Idea was to undertake a comprehensive analytics of the production tickets that were created in those applications and come up with a set of predictions of problems those applications may throw up in future. With this knowledge in place, client in addition wanted the team to make suitable recommendations to alleviate those future problems by initiating appropriate corrective and preventive measures.

2. Client Expectation from AMS Team

Based on the above client ask, a comprehensive ticket analytics was carried out by the AMS team.

Client had the following questions, which they wanted AMS team to find an answer based on analytics of all the production tickets uncovered so far.

1. A view on ticket volumes, SLA performance and MTTR portfolio wise
2. A view on ticket volumes, SLA performance and MTTR applications wise
3. A view on ticket volumes, SLA performance and MTTR defect classification wise
4. A view on the systems which are in trouble today
5. Predict which applications may have SLA misses in future?
6. Which systems will be required to have predictive maintenance to improve their performance?
7. Which systems appear to be heading for a meltdown (applications which can break easily)?
8. Which systems am I being lazy about and haven't shown improvement for years (applications which need special attention, which probably is not being paid)?

The study has undertaken with production incidents (ticket data), for immediately preceding one year which translated to 1998 incidents that occurred in the span of immediately preceding one year.

There exist 138 individual applications supporting various operational, tactical and strategic requirements of the organization. These applications are classified into 4 portfolios depending on the area of usage and technology used for these applications namely

- GEN-CSL-3 : Group of applications hosted on GenApps technology

- GEN-CSL-2 : Group of applications hosted on GenApps technology
- SAP-CSL-3 : Group of applications hosted on SAP technology
- SAP-CSL-2 : Group of applications hosted on SAP technology

Objective of this ticket analytics was to look at and analyze production tickets originating in these four portfolios and gain an understanding on critical attributes of these incidents. The critical attributes of interest comprised of the following.

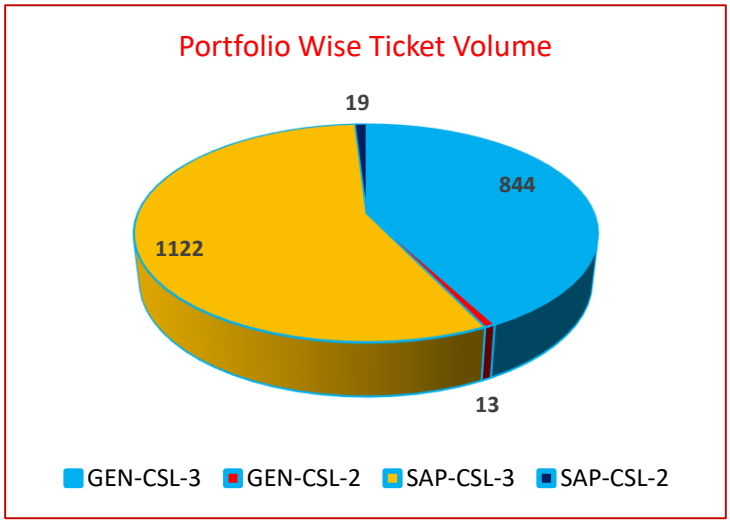
- Ticket Volume
- SLA Performance
- MTTR (Mean Time to Restore)

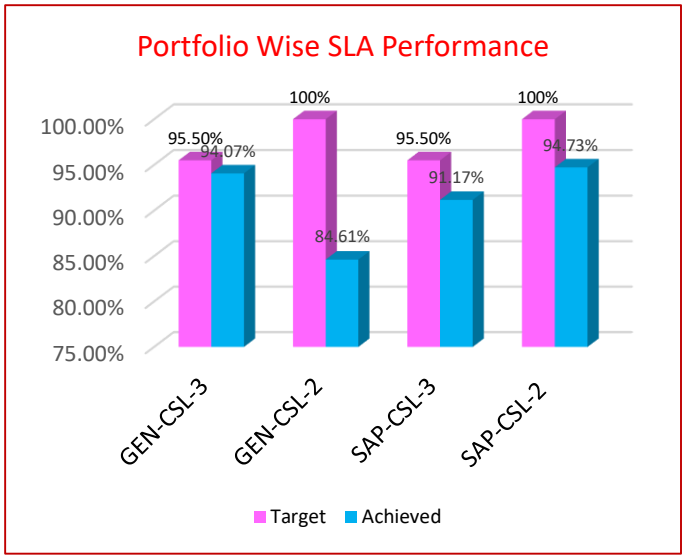
AMS Team focused on a detailed analysis of the incidents and creating suitable graphical presentation representing each area of concern stated above. AMS team arrived at appropriate problem specifications using a set of hypothesis.

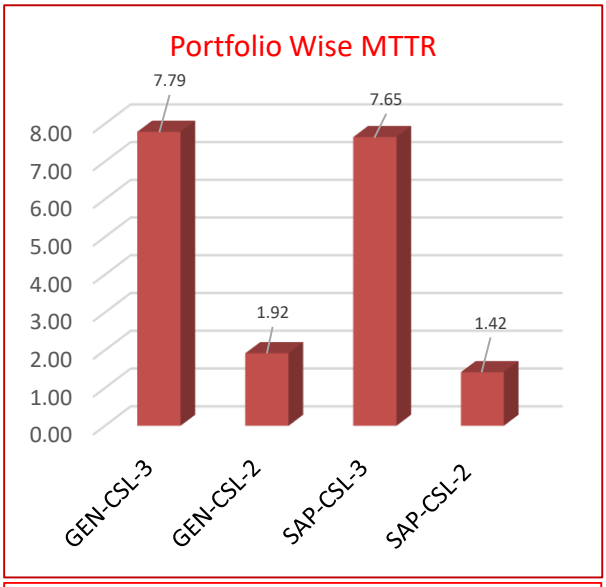
3. Detailed Technical Approach

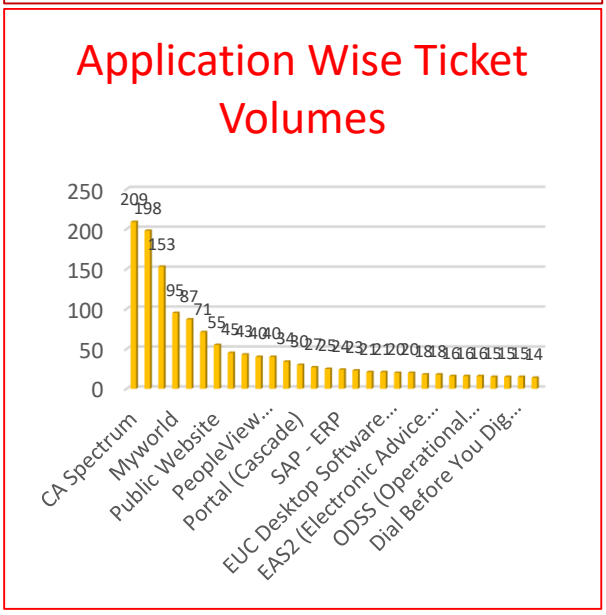
Following section provides a description of the detailed ticket analytics performed by the AMS team with production incidents uncovered in preceding one year.

3.1 Following section provides a view on ticket volume, SLA performance and MTTR portfolio wise and Application Wise Ticket Volume

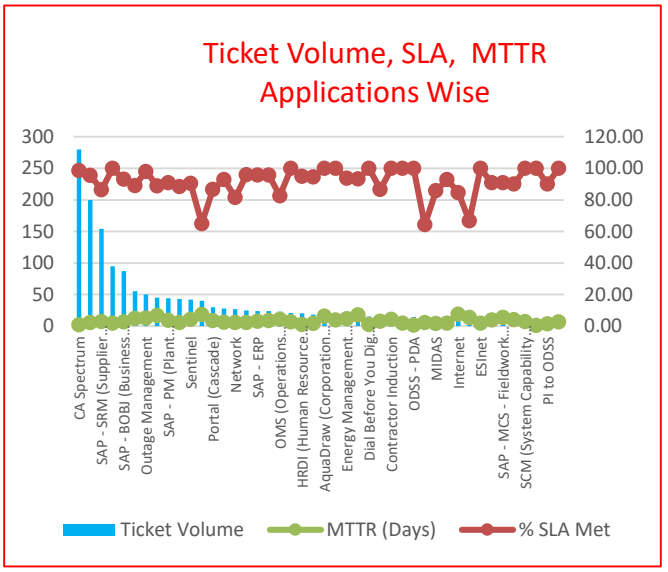




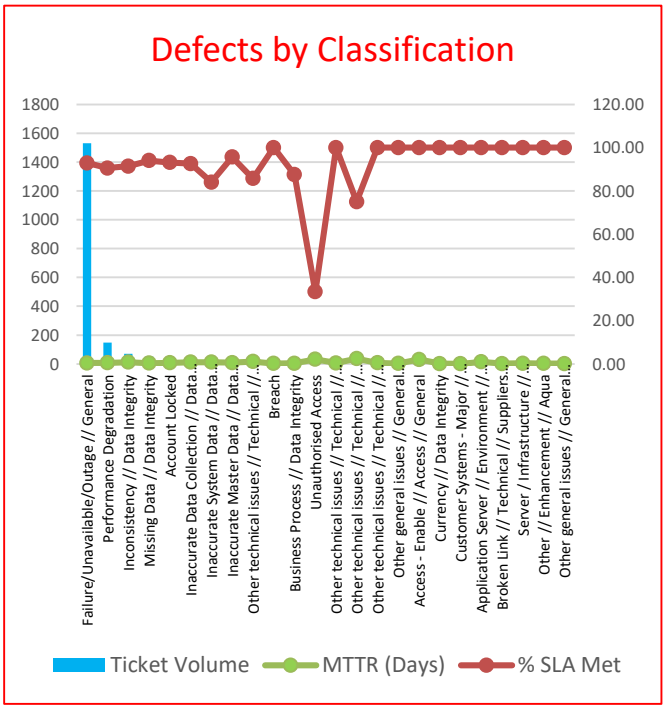




3.2 Following section provides a view on ticket volumes, SLA performance and MTTR applications wise



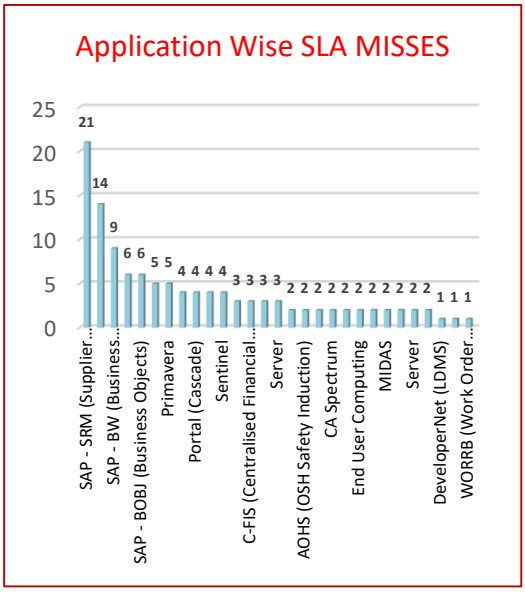
3.3 Following section provides a view on ticket volumes, SLA performance and MTTR defect classification wise



3.4 A view on the systems which are in trouble today

Following section provides a list of systems (applications) which are in trouble today. The systems which had SLA misses in the recent past are the systems which are in trouble today.

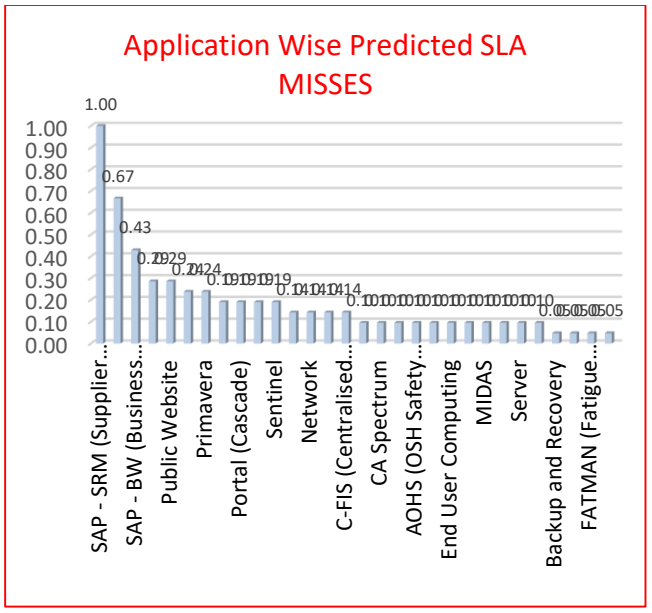
Diagram below provides the systems which had SLA misses in recent past and are the systems which are in trouble at present. Count against the applications indicates number of SLA misses.



3.5 Predict which applications may have SLA misses in future?

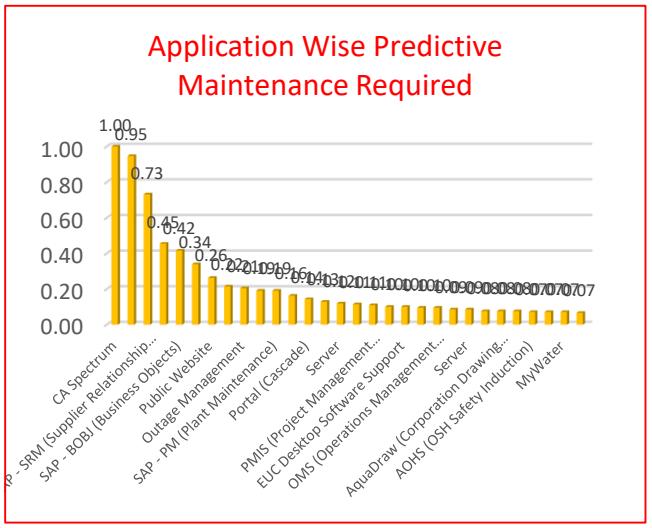
Hypothesis used: Applications with higher SLA MISSES in the immediate past will have higher probability of SLA misses in immediate future.

Therefore applications with predicted SLA misses in immediate future are given below. 1 is the highest probability of SLA misses and 0 is the lowest probability of SLA miss as pictorially depicted below.



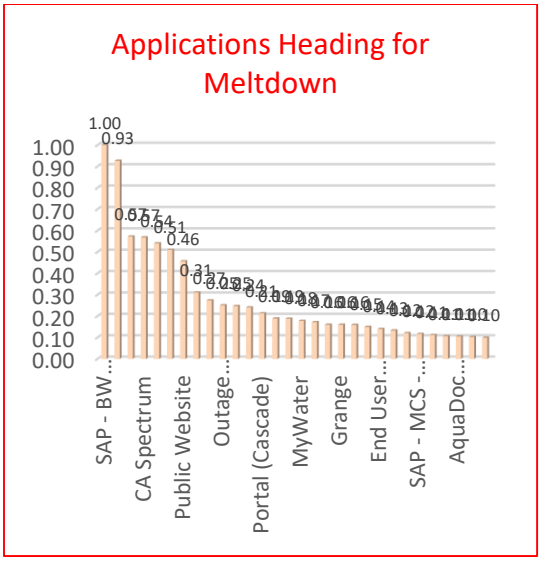
3.6 Which systems will be required to have predictive maintenance to alleviate their future performance?

Hypothesis used: Applications with higher ticket volumes in the immediate past will have higher probability of ticket volume in immediate future and will require predictive maintenance. 1 is the highest probability of ticket volume and 0 is the lowest probability of predictive maintenance requirements as pictorially depicted below.



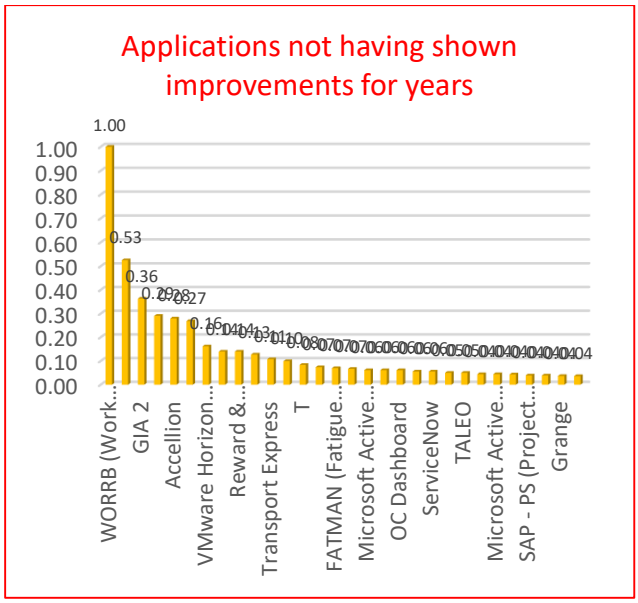
3.7 Which systems appear to be heading for a meltdown (applications which can break easily)?

Hypothesis used: Applications with higher Number of Tickets and Higher MTTR in the immediate past are the applications which are heading for meltdown (applications which can break easily). 1 is the highest probability of applications and 0 is the lowest probability applications heading for meltdown depicted in the graph below.



3.8 Which systems am I being lazy about and haven't shown improvement for years (applications which need special attention, which probably is not being paid)?

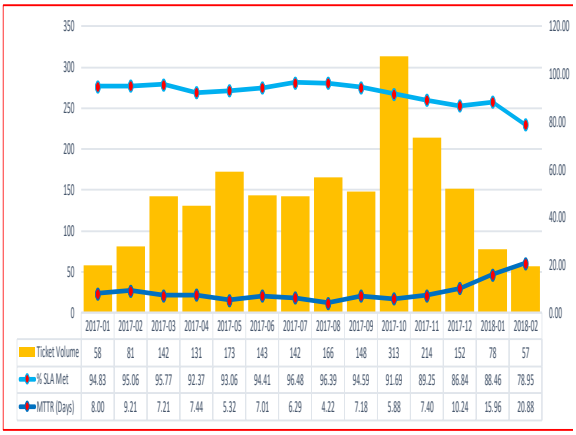
Hypothesis used: Applications with lower Number of Tickets and Higher MTTR in the immediate past are the applications not showing improvements for year. 1 is the highest probability of applications and 0 is the lowest probability of applications not showing improvements for years.



4. Additional Statistics

Some additional statistics were created by the team to provide added insight to the client organization about the nature of problems the systems are facing.

4.1 Ticket Volume, SLA and MTTR - Month Wise



Observations:

MTTR: Trend is increasing

SLA: Trend is declining

Ticket Volume: Trend is increasing, and then declining since October 2017

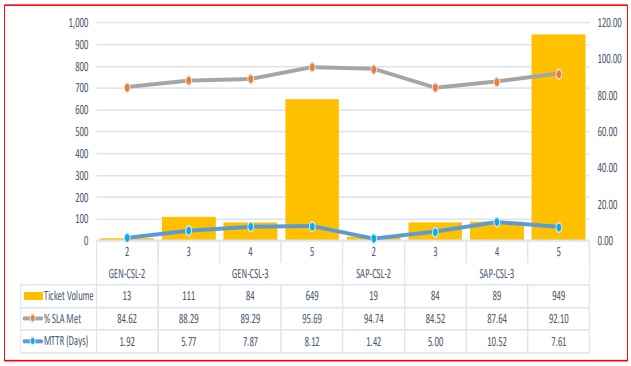
SLA Targets

GEN-CSL-2: 100%

GEN-CSL-3: 95.50%

SAP-CSL-2: 100%

SAP-CSL-3: 95.50%



Observations

MTTR: High in GEN-CSL-3 and SAP-CSL-3, Priorities 4 and 5 specifically

SLA: Failing across all 4 groups, except GEN-CSL-3 Priority 5

Ticket volume: Highest in Priority 5

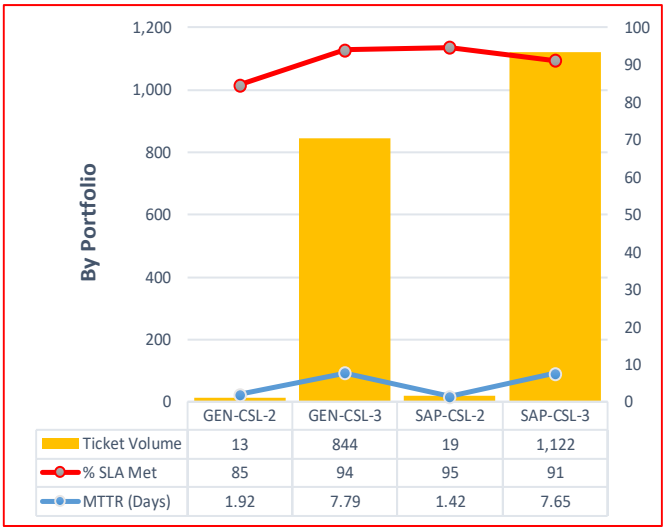
SLA Targets

GEN-CSL-2: 100%

GEN-CSL-3: 95.50%

SAP-CSL-2: 100%

SAP-CSL-3: 95.50%



Observations:

MTTR: Low in GEN-CSL-2 and SAP-CSL-2

SLA: Lowest in GEN-CSL-2, but failing across all 4 groups

Ticket volume: Highest in SAP-CSL-3

SLA Targets

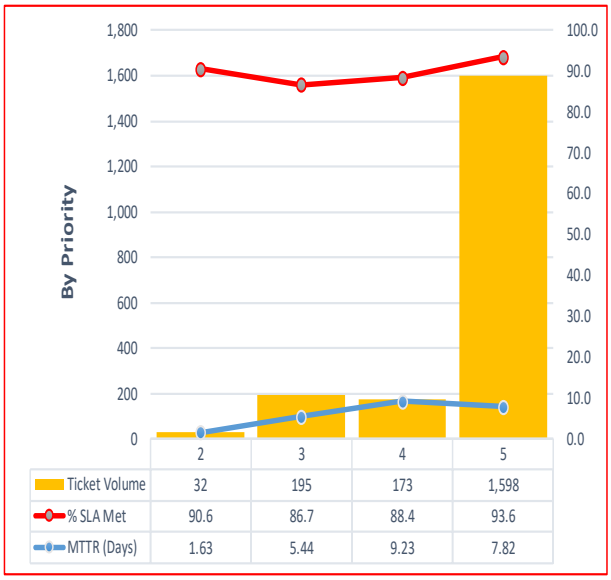
GEN-CSL-2: 100%

GEN-CSL-3: 95.50%

SAP-CSL-2: 100%

SAP-CSL-3: 95.50%

4.2 Ticket Volume, SLA and MTTR – Portfolio/Priority Wise



Observations:

MTTR: High for Priorities 4 and Priority 5

SLA: Lowest in P3, but failing across all Priorities

Ticket volume: Highest in Priority 5

SLA Targets

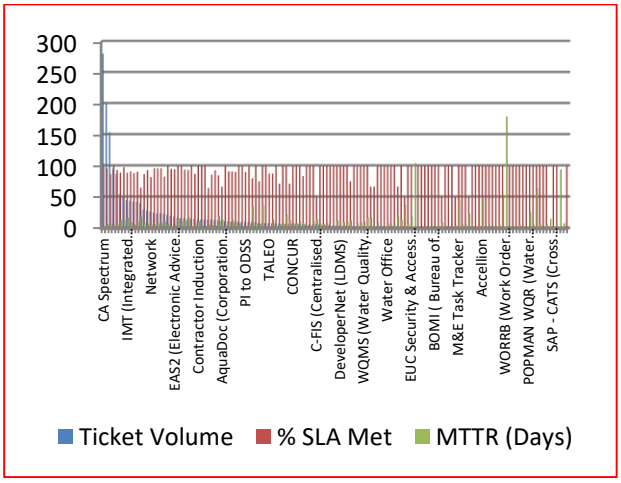
GEN-CSL-2: 100%

GEN-CSL-3: 95.50%

SAP-CSL-2: 100%

SAP-CSL-3: 95.50%

4.3 Ticket Volume, SLA and MTTR – Application Wise



5. Recommendations

Based on above detailed ticket analytics the AMS team made following recommendations to the client organization. Recommendations were identified highlighting any gaps in applicable process and process implementation.

- Study the applications which are in trouble. Look at the root cause of those tickets attributed to SLA misses and have following action plan in place
    - Lack of application knowledge - Identify resource skill matrix, training plan, develop training modules, application knowledge repository, resource wise training calendar.
    - Lack of business knowledge - Arrange periodic training sessions by Business Analyst imparting business and industry knowledge to the AMS team as appropriate.
    - Lack of SME support – Identify SME support to bridge the knowledge gaps, focused and systematic training to reduce skill gaps and industry knowledge.
    - Dependency issue (Business, Technical) - Advance planning, regular governance meeting with all stake holders, highlighting any dependency with advance provisioning.
    - Deliverable quality issue (inadequate review, testing) – Look at review and test plan, review and test cycle time, review and test coverage and efficiency, establish end to end test metrics highlighting any gaps in review and testing process.
    - Infrastructure issue or environmental issue - Regular multi vendor governance, discuss and plan any infrastructure issue or environmental requirements, ensure advance intimation and provisioning.
    - Test environment/test data issue - Regular governance with test team, review any test environment/test data issues, review any known constraints, put in place and advance remedial plan for ensuring environment, test data availability.
    - Lack of automated testing, regression testing - Explore automated unit testing, regression test, advance test data preparation
- Study the application which may be in trouble. Analyze historical SLA misses in those applications. Look at the root cause of those

tickets attributed to SLA misses and have similar plan as above in place.

- Look at systems which are contributing to highest volume of tickets, and bring down the number of tickets by way of process improvements, looking at Classification of failures by identifying/improving any generic/recurring cause of failures.

- Perform RCA on applications predicted to result in SLA misses

- Focus on and evolve a clear action plan for applications with Predictive Maintenance Required for these Applications

- Bring to Management and IT attention for Systems identified as heading for meltdown and Systems being lazy about, and put in place a corrective and recovery action plan

- Bring down the high Mean Time to Resolve (MTTR) of P3,P4,P4 by way of additional knowledge acquisition, on the job training

- Look at systems which are contributing to highest volume of tickets, and bring down the number of tickets by way of process improvements, looking at Classification of failures by identifying/improving any generic/recurring cause of failures.

- Perform a detailed analysis on application wise SLA Misses. Perform a detailed analysis on the applications with SLAs misses, defect classification of the tickets, MTTR of tickets, system environment, test environment, review and testing done. Based on this analysis, attributed the SLA misses to following set of possible reasons. The reasons include lack of application knowledge, lack of business knowledge, infrastructure issue, environmental issue, system load issue, SME support issue, resource issue, any constraints/limitations. Based on this analysis tailor an action plan to remedy the cause of the SLA misses which could include Analyze applications with predicted SLA misses. Strengthen current knowledge level of the team around those application areas, look at historical SLA misses from the above analysis prepare and put in place a set of action plans to alleviate any constraints/limitation that may impact the SLA adherence. Develop training plans and modules, resource re-alignment as appropriate, upfront plan for SME availability, system availability, test environment, test data, and introduce COG3 for ticket resolution.

- Similar Action Plan should be formulated as above for applications with Predictive Maintenance Required.

- Bring to Management and IT attention for systems identified as heading for meltdown and systems being lazy about, and put in place a corrective and recovery action plan. This would include analyzing the business impact of such meltdown, ability of the team to quickly address critical issues and have an action plan in place for any anticipated surge in ticket volumes. This may include resource augmentation, resource realignment, ensuring SME support, ensuring system availability, test data availability, with eventually heightened focus around these applications.

- Carry out a similar root cause analysis on high MTTR in P3, P4,P5 tickets, and identify a set of possible causes namely additional knowledge acquisition, on the job training, right skilling acquisition, SME knowledge acquisition, system/infrastructure availability issue, test environment/test data issue, etc. This would be followed by a similar action plan as above, for improvements in all above areas in a time bound manner.

- Introduce COG3 for improving Mean Time to Resolve (MTTR) for tickets of all classes

6. Conclusion

As mentioned in the beginning, that the Application Maintenance and Support (AMS) team was engaged in providing end to end Application Maintenance and Support services of large number of applications performing a host of operational, tactical and strategic functions of the organization. The team has been providing AMS support of these applications for the last two years very efficiently with almost 100% compliances of all applicable SLAs. The team gained considerable knowledge of the applications in the process and have been able to solve some of the most critical and challenging production problems. Client has expressed their deep appreciation of the work being done by the AMS team from time to time.

However, in spite of the best effort by this AMS team, it was found that, there was still fairly large number of production incidents that were being opened. In view of the same, client wanted to get to the bottom of the problem and wanted a better understanding on these applications in terms of

their nature of defects to unearth certain fundamental characteristics of these applications. Client therefore wanted the AMS team to delve into the defects that have uncovered so far and carry out a comprehensive analysis of those defects (production incidents) to bring out certain very fundamental characteristics of those applications in terms of nature of future problems they may throw up in their operational life. Idea was to undertake a comprehensive analytics of the production tickets that were created in those applications and come up with a set of predictions of problems those applications are likely throw up in future. With this knowledge in place, client in addition wanted the team to make suitable recommendations to alleviate those future problems by initiating appropriate corrective and preventive measures. The AMS team focused on this ticket analytics and made the above recommendations a series of steps which will have potential impact on those applications and will bring down the number of production incidents originating from those applications.

7. Key References and Bibliography

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