Information Security Management System
Capacity Management Policy & Procedure

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Custodian	Corporate IT dept.	
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Owner	Corporate IT Dept.	

Distribution list

Name
To all locations of JMB group.

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Contents

Purpose

JMBGRP recognizes that advance planning and preparation is required to ensure adequate IT capacities and resources are available when required for business processes to function efficiently.

Scope

All Locations of J.M Baxi Group in India

All Employees of J.M Baxi Group

Policy Statement

- Capacity Planning is required to be undertaken by IT TEAM to facilitate in the meeting of operational and business objective of the company in order to address the current and future needs in a structured, formal approach.
- Capacity planning shall also encompass information technology personnel who are directly responsible for the maintenance and functioning of the enterprise-wide information systems infrastructure of the JMBGRP.
- It is desired that all the IT resources usage are monitored in terms of average usage in a standardized manner and if any deficiency found then that shall be reported to identified group as the case may be for remedial action.
- Capacity planning shall be initiated for IT resources and services, keeping in mind the present and future requirements are in consonance with the long-term business vision and growth of the JMBGRP.
- JMBGRP shall adopt a Manual process for assessment of capacity utilization on a monthly basis and going forward it is in planning phase II tool will be in place.
- Periodic reviews shall be planned through the IS group and the MR.

Procedure

1.1. The capacity management process has six major sections:

1.1.1. **Capacity assessment and planning -** This phase of the capacity management process deals with planning for the current and the future capacity requirements and preparing the capacity plan. During this phase, the requirements are gathered from the different service management functions to assess their impact on capacity.

1.1.2. **Capacity implementation-** In this phase, actions derived from the capacity plan are implemented through change management process to have an effective control on the live environment and to minimize the service disruption.

1.1.3. **Capacity monitoring and analysis-** In this phase, the utilization and performance of the IT resources are monitored, and the data collected is analyzed to identify the trends. This helps in establishing the baseline for utilization.

1.1.4. **Capacity optimization-** During this phase, assessment is performed to optimally utilize the existing IT resources and improve the performance of an existing service. The optimization reduces the cost of the service by avoiding unnecessary procurement of resources.

1.1.5. **Demand management-** The demand management ensures optimal use of the IT resources and people.

1.1.6. **Modeling-** The objective of modeling is to predict the behavior of the IT services and resources under a given volume of work.

1.2. Capacity Assessment & Planning

1.2.1. Capacity Assessment & Planning phase is where all the forecast data from business is collected and business needs from a capacity management perspective is identified. This stage is very crucial in ensuring that adequate capacity for IT services is planned to respond to the business needs.

1.2.1.1. Gather business requirements.

1.2.1.1.1. Application and Infrastructure representatives.

1.2.1.1.1.1. Collate the expected growth information of the various groups in conjunction with the infrastructure reports. Archive the collected capacity information. The functional application support team of the tenant shall provide capacity input for the existing applications. This input should contain the following data:

1.2.1.1.1.2. Total number of users per application and associated infrastructure which supports it.

1.2.1.1.1.3. Number of concurrent users per application.
1.2.1.1.1.4. Expected growth in the number of total users per application.
1.2.1.1.1.5. Expected growth in the number of concurrent users per application.

1.2.1.1.1.6. Number of batch jobs per application.

1.2.1.1.1.7. Periodicity: This activity should happen at least once in a quarter.

1.2.1.1.2. Demand representatives:

1.2.1.1.2.1. The IT Team schedules a meeting with the tenant demand representative(s) to discuss the foreseen business, required infrastructure technology and application changes, and their impact on capacity planning. Also, organizational changes (amount of users,

etc.) and potential required capacity management impact should be discussed.

1.2.1.1.2.2. Periodicity: This activity should happen at least every quarter.

1.2.1.2. Identify high level resources required.

1.2.1.2.1. Determining the high-level resource requirement refers to identifying the different type of resources required for providing the service. The resources include:

1.2.1.2.1.1. Technology infrastructure components.

1.2.1.2.1.2. Human resources.

1.2.1.2.2. The Number of resources required is identified later during resource estimation stage.

1.2.1.2.3. The business requirements from the Capacity Manager along with the availability design and recovery design are used for assessing the required resources.

1.2.1.2.4. The high-level resource requirements are captured in the Ticketing Tool.

1.2.1.3. Determine current and future workload:

1.2.1.3.1. Assess the current workloads and future business requirements to ensure that adequate capacity is made available to meet the future demand.

1.2.1.3.2. For the existing services the following information are gathered:

1.2.1.3.2.1. Details of the resources supporting the service – type of resources, number of resources, and their role in providing the service (Example primary / backup).

1.2.1.3.2.2. Maximum usable capacity for each identified resource.

1.2.1.3.2.3. Different sources utilizing the resource (Example. Source includes applications & project groups).

1.2.1.3.2.4. Utilization details of each resource for a defined period and for each source.

1.2.1.3.2.5. Current business volumes/throughput for each service.

1.2.1.3.3. The current workload and future business requirement details help in understanding the following:

1.2.1.3.3.1. Usage trend.

1.2.1.3.3.2. Predicting the future demands.

1.2.1.3.3.3. Risk and constraints.

1.2.1.3.4. At the start of the process, supply should be matched with forecast demand including an error margin; once the forecast quality has stabilized/improved, supply can be matched with the forecast demand without error margin.

1.2.1.3.5. Modelling techniques such as trending, analytical, and simulation can be used to predict the workload behavior of the Services and resources. The choice of modeling technique and the depth to which the data needs to be analyzed depends on the business need and criticality of the Services.

1.2.1.3.6. Capture the current and future workload details in Ticketing Tool.

1.2.1.4. Estimate resource requirement & consolidate resource requirement with cost detail:

1.2.1.4.1. Perform resource estimation to identify the right resources at optimal cost, to meet the current and future needs of the business. The estimation should cover the timeline by which the resource should be available.

1.2.1.4.2. The appropriate configuration and type for hardware resources, versions for software and skill set requirement for human resources.

1.2.1.4.3. Analyze different scenarios to provide the resource estimation at an optimal cost. Use demand management options such as sharing the workload across different timelines and the splitting of workload with multiple resources.

1.2.1.4.4. Perform detailed cost estimation to ensure that the services can be delivered at the agreed cost. The cost estimation aids the financial management to allocate funds, control expenditure, and for budget estimations.

1.2.1.5. Estimated capacity can meet service level:

1.2.1.5.1. Analyze the following factors to check if the expected service targets can be met with the estimated capacity within the agreed cost.

1.2.1.5.1.1. SLA (Service Level Agreements).

1.2.1.5.1.2. SLR (Service Level Requirement).

1.2.1.5.1.3. Workload details.

1.2.1.5.1.4. Risk and constraints.

1.2.1.5.1.5. Capacity requirement.

1.2.1.5.1.6. Cost estimates.

1.2.1.6. Provide inputs for negotiating service levels:

1.2.1.6.1. Provide input for negotiating the service levels. The inputs would include.

1.2.1.6.1.1. The cost of estimated capacity.

1.2.1.6.1.2. Limitations and capability of the proposed technology.

1.2.1.6.1.3. Use the following factors to negotiate the service levels.

1.2.1.6.1.4. Cost negotiations.

1.2.1.6.1.5. Target negotiations.

1.2.1.6.1.6. Change of technology.

1.2.1.6.1.7. Options for charging.

1.2.1.7. Define monitoring parameters and threshold limits:

1.2.1.7.1. Defining the monitoring parameters and thresholds are necessary to proactively manage the capacity of the resources and to avoid any over utilization. Over utilization of the resources impact their performance and can lead to the unavailability of resources.

1.2.1.7.2. Identify appropriate monitoring parameters based on the following factors:

1.2.1.7.2.1. Resource type, purpose and its capabilities.

1.2.1.7.2.2. Projected workload.

1.2.1.7.2.3. Expected service targets.

1.2.1.7.3. Define appropriate threshold limits based on the following factors:

1.2.1.7.3.1. Capacity of the resource.

1.2.1.7.3.2. Current peak and off-peak usages.

1.2.1.7.3.3. Timeline to resolve the threshold breaches.

1.2.1.7.3.4. Available solutions to fix breaches.

1.2.1.7.3.5. Expected service targets.

1.2.1.8. Prepare Capacity Plan:

1.2.1.8.1. The capacity plan is one of the key outputs of capacity management process. Prepare the capacity plan as per business requirement, and review and publish it every quarter or in line with the business budgetary life cycle.

1.2.1.8.2. The capacity plan describes the service capacity requirements and the planned service and resource capacity to meet the business requirements.

1.2.1.8.3. Maintain & update the capacity estimation and tracking checklist to consolidate and track the capacity requirement to initiate the Request for Change or the procurement or the hiring request with the appropriate team. The capacity forecast should have a time horizon of 6 months to take care of the setup lead time.

1.2.1.8.4. The capacity plan is prepared using the capacity plan template and includes the following details:

1.2.1.8.4.1. Current and recent service provision.

1.2.1.8.4.2. Service forecast.

1.2.1.8.4.3. Resource utilization.

1.2.1.8.4.4. Resource forecasts.

1.2.1.8.4.5. Cost estimation.

1.2.1.8.4.6. Business scenarios & key business events (for example year end financials, seasonal sales periods, maintenance periods).

1.2.1.9. Review & Publish Capacity Plan:

1.2.1.9.1. Review the capacity plan to ensure detailed coverage and accuracy. Involve stakeholders from different domains to validate the plan.

1.3. Capacity Implementation:

1.3.1. Capacity implementation is the phase where the capacity plans as defined in the first phase are being implemented:

1.3.1.1. Identify the capacity changes to be implemented.

1.3.1.1.1. The capacity plan contains details of all the capacity related changes that are identified during the capacity planning and analysis.

1.3.1.1.2. The following are the types of capacity changes to be implemented:

1.3.1.1.2.1. Tuning the resources and services for better utilization and/or performance.

1.3.1.1.2.2. Changes in the monitoring parameters and thresholds to proactively avoid performance breaches.

1.3.1.1.2.3. Upgrades and new procurement of resources when there is a Capacity shortage.

1.3.1.1.2.4. Enhance the skills of people resources when there is a performance breach because of skills.

1.3.1.1.2.5. Identification of new people resource requirement where the delay in response is due to the shortage of people resource.

1.3.1.2. New or upgrade resources

1.3.1.2.1. Procure or upgrade resources under the following circumstances:

1.3.1.2.1.1. During the implementation of the new or changed services.

1.3.1.2.1.2. When the service breach is due to insufficient capacity.

1.3.1.2.1.3. When the current capacity of resources can't handle the predicted workload.

1.3.1.2.2. When a resource has to be procured or upgraded, the purchase request is raised, and the necessary business and financial justifications are provided.

1.3.1.3. Sourcing people resources.

1.3.1.3.1. Source people with when the service breaches are due to shortage of people.

1.3.1.4. Raise request for people.

1.3.1.4.1. Hire People with right skill to manage the services and technology infrastructure effectively.

1.3.1.4.2. The capacity management determines the following details from the capacity plan and raises the request for hiring people resources to the relevant function.

1.3.1.4.2.1. The list of people required.

1.3.1.4.2.2. The list of services and technology infrastructure that each resource is expected to manage.

1.3.1.5. Tuning solutions:

1.3.1.5.1.1. Tune the resources for optimal usage:

1.3.1.5.1.2. During the implementation of new services or changes to the existing services to handle the predicted workload.

1.3.1.5.1.3. When the service breach is due to the poor performance of the resources.

1.3.1.5.2. Generally, the tuning options include problem management knowledge base, technical reference books and articles.

1.3.1.6. Monitoring configurations:

1.3.1.6.1. Identify the monitoring parameters and thresholds to proactively address the performance issues.

1.3.1.6.2. Perform this action when:

1.3.1.6.2.1. The resource is newly implemented.

1.3.1.6.2.2. Analysis of the utilization data and incident/problem data, the additional parameters are identified to monitor for better control.

1.3.1.6.2.3. Resource is tuned for better usage.

1.3.1.7. People skill set optimization through training:

1.3.1.7.1. Identify the training needs for the people based on the services and technology infrastructure that they need to support.

1.3.1.7.2. Identify the required training by comparing the current skill set of the resources with the required skill set.

1.3.1.8. Automated Monitoring:

1.3.1.8.1. Monitoring of IT resources and services can be done either manually or through tools.

1.3.1.8.2. To monitor using automated tools, the tools have to be configured for the respective services and resources with the identified parameters, threshold limits and alerts. The automated tool can monitor the utilization, verify threshold breaches and send notifications. These shall include (configuration management tools, network management tools, application monitoring tools and security and incident management tool).

1.3.1.9. Collate all necessary documents to raise RFC :

1.3.1.9.1. The capacity related changes are implemented through change management to avoid impact on existing infrastructure.

1.3.1.9.2. For raising the RFC (Request for Change), it is necessary to gather different supporting documents including: (for applications and infrastructure).

1.3.1.9.2.1. Tuning instructions.

1.3.1.9.2.2. Rollback instructions.

1.3.1.9.2.3. Post implementation test conditions.

1.3.1.9.2.4. Monitoring parameters & threshold details.

1.3.1.9.2.5. Configuration instructions.

1.3.1.9.2.6. Business case.

1.3.1.9.3. Once the RFC is approved, it is necessary to monitor the implementation of capacity related changes to know the status and to extend support, if necessary, for a successful implementation.

1.3.1.9.4. When monitoring the implementation, necessary instructions are provided to the change implementer to proactively prevent issues.

1.3.1.9.5. When implementing the tuning instructions, if the expected results are not achieved, then the changes should be rolled back.

1.3.1.10. Prepare capacity monitoring checklist:

1.3.1.10.1. The capacity plan contains the details of the parameters to be monitored for different types of devices. These parameters are frequently reviewed and modified during the analysis of the capacity data.

1.3.1.10.2. Manual monitoring checklist is created for each resource containing the following details:

1.3.1.10.2.1. Device to be monitored.

1.3.1.10.2.2. Parameters to be monitored on each device.

1.3.1.10.2.3. Respective threshold limits.

1.3.1.10.2.4. Frequency in which they need to be monitored.

1.3.1.10.3. The frequency of monitoring must have fine enough granularity to capture transient peaks, e.g. backups impacting network traffic, batch processes impact online performance amongst others.

1.3.1.10.4. The parameters for monitoring are identified from the capacity plan and the threshold limits for each device are set it's:

1.3.1.10.4.1. Purpose.

1.3.1.10.4.2. Criticality.

1.3.1.10.4.3. Capacity.

1.3.1.10.4.4. Usage.

1.3.1.10.4.5. These monitoring checklists are reviewed and modified when necessary.

1.3.1.11. RFC successful:

1.3.1.11.1. Based on the review of the implementation status, if the change has met its objective, then proceed to " 1.3.1.13 – Update status to stakeholders" else proceed to "1.3.1.12– Rework on Implementation plan".

1.3.1.12. Rework on implementation plan:

1.3.1.12.1. Where necessary, modify the change implementation plan by liaising with respective teams and the RFC is re-initiated to implement the modified solution.

1.3.1.13. Status update to Stakeholders:

1.3.1.13.1. Communicate the information on capacity related changes are to the respective stake holders to monitor and manage them effectively.

1.4. Capacity Monitoring & Analysis:

1.4.1. Capacity Monitoring & Analysis is the phase where continues monitoring of capacity related metrics takes place. This stage is very crucial not only for monitoring the capacity data but also for analyzing the capacity trends and forecasting the future needs.

1.4.1.1. Monitor utilization of each resource and service. Record utilization data:

1.4.1.1.1. Perform monitoring of resources and services to identify their usage and proactively address the issues when there is a threshold breach. Alerts are sent whenever there is a breach of threshold.

1.4.1.1.2. The parameters to be monitored for each resource and service are identified from the monitoring checklist.

1.4.1.1.3. Automated monitoring tools are the best possible option for monitoring the utilization and sending alerts.

1.4.1.1.4. Record the utilization information of the resources and services in CDB to facilitate further analysis. These data help in identifying the trend of usage and their peaks and off-peaks.

1.4.1.2. Is threshold breached:

1.4.1.2.1. Identify the threshold breaches to initiate alerts and incidents.

1.4.1.2.2. Compare the utilization data with the threshold limits and if there are any breaches, then proceed to "Incident Management", else proceed to "1.4.1.3 – Analyze Service Performance".

1.4.1.3. Analyze service performance & respective resources utilization.

1.4.1.3.1. Analyze the performance of the service to.

1.4.1.3.1.1. Understand the current performance.

1.4.1.3.1.2. Predict the risk.

1.4.1.3.1.3. Take necessary precautions.

1.4.1.3.2. Gather the transaction rate and response time for different services and analyze the same to identify the services with poor performance.

1.4.1.3.3. Perform additional investigation by comparison of business volume data against baseline volumetric.

1.4.1.3.4. For example: Many factors including but not limited to disk size, processor speed, and memory determine the performance of the resource.

1.4.1.4. Analyze current demand and forecast demand on services and resources.

1.4.1.4.1. Assess the current and future demands to predict the behavior of the services and to ensure that adequate capacity is made available to meet the future demands. This would involve measuring the business load:

1.4.1.4.1.1. Measure the real workload details in both business and technology terms (resource utilization and business load) to help identify the trend of usage and predict the future demand.

1.4.1.4.1.2. Correlate the business load with the infrastructure utilization (for example - establish relationship between # of page views and the CPU utilization). This would help determine the maximum business load possible in the current infrastructure installation and predict the moment of breach.

1.4.1.4.1.3. Analyze the current demand for the impacted services. This would help take a decision to design and build more infrastructures to support future demand.

1.4.1.4.2. Modelling techniques such as trending, analytical, and simulation can be used to predict the workload behavior of the services and improve the forecast.

1.4.1.4.3. To predict the behavior of service and resource proceed to “4.7.1.1 – Modeling request”.

1.4.1.5. Identify the external changes, impact, and corrective action:

1.4.1.5.1. Determine the external changes and identify the impact to ensure that the capacity and performance provided will not be affected by the external changes. The external changes include the following:

1.4.1.5.1.1. Regulatory changes.

1.4.1.5.1.2. Changes in third party suppliers supporting the services.

1.4.1.5.1.3. Changes in technology.

1.4.1.5.2. Identify the external factors that have an impact on the services and resources, gather their current changes and analyze them to identify the impact on the services and resources.

1.4.1.5.3. Identify the corrective actions to rectify the performance issues of the services and resources. The corrective action also considers the future workload of the services and their associated resources.

1.4.1.5.4. While identifying the corrective action, identify the possibilities of addressing the demand by tuning the existing resources. Tuning helps in optimal use of the existing resources without going for an upgrade.

1.4.1.5.5. If tuning is not possible to address the demand for resource and services, then consider demand management techniques.

1.4.1.5.6. When it is not possible to manage the performance by either tuning or through demand management, then consider necessity for upgrading the resources.

1.4.1.5.7. When the corrective action identified for one tenant (client/stakeholder/entity/customer) is going to have a wide impact affecting multiple tenants and has a longer implementation span, and then it has to be initiated through service improvement program to get the necessary focus and funding.

1.4.1.6. Type of corrective action:

1.4.1.6.1. If the identified corrective action is optimization, proceed accordingly

1.4.1.6.2. If the upgrade is necessary for resources, then proceed to "4.4.1.8 - Capacity Assessment and Planning Upgrade".

1.4.1.6.3. If service improvement is necessary, then proceed to "4.4.1.7 – Raise service improvement request".

1.4.1.7. Raise service improvement request.

1.4.1.7.1. Recommendations for improving the service performance are provided as an input to the service improvement plan. These service improvement recommendations can be either proactive or reactive.

1.4.1.7.2. Proceed to service improvement process.

1.4.1.8. Capacity Assessment and planning upgrade recommendation:

1.4.1.8.1. Raise purchase request to upgrade the resources or procuring new resources. Business case is required for the approval of the Purchase Request.

1.4.1.8.2. Document all the necessary justifications for raising the purchase request. For example, if increased business volume is the reason for poor performance, then such justifications can be provided for purchases and to get funding from the business. Proceed to "4.3.1.1 Capacity Implementation".

1.5. Capacity Optimization

1.5.1. The analysis of the monitored data may identify areas to optimally utilize the existing resources by tuning and improve the performance of the particular Service. The optimization reduces the cost of the Service by avoiding unnecessary procurement of resources.

1.5.1.1. Gather all analysis recommendation and data:

1.5.1.1.1. Gather all the analysis recommendation and data to generate the optimization instructions.

1.5.1.1.2. Gather the following data for defining the optimization instructions:

1.5.1.1.2.1. Services and resources impacted.

1.5.1.1.2.2. Identified corrective options.

1.5.1.1.2.3. Current & future workload details.

1.5.1.1.3. Additional data may be required for generating the optimization instructions, which can be gathered from the relevant team.

1.5.1.2. Determine service and resource to be optimized with the schedules:

1.5.1.2.1. Identify different optimization options to determine the sub-components of the resources to be optimized. Optimization options includes:

1.5.1.2.1.1. Tuning.

1.5.1.2.1.2. Demand Management.

1.5.1.2.1.3. Both of the above.

1.5.1.2.2. Identify the schedule for optimizing the sub-components based on the demand for the resources and the criticality of the resources.

1.5.1.3. Identify, document and test the optimum level for tuning:

1.5.1.3.1. Identify the optimum level for tuning to determine the maximum level to which the resources or services can be tuned. Tuning the applications optimizes the resources and services. Product documentation aids in understanding the different features of the resources and their tuning possibilities.

1.5.1.3.2. Another approach is comparative test in the non-production environment, i.e., run a load test before and after making the change in test environment – if there is an improvement this can be promoted to production.

1.5.1.3.3. Other approaches may be required to mitigate risks if such an environment is not available to test.

1.5.1.4. Document and test demand management instructions:

1.5.1.4.1. Demand management helps identify the ways by which the demand can be managed.

1.5.1.4.2. To generate demand management instructions, proceed to “1.6.1.1 – Determine the Demand and Health of resource Sub-components”.

1.5.1.4.3. Demand management can be done in two ways:

1.5.1.4.3.1. Resource that is underutilized can be shared to meet the demand of a heavily utilized system.

1.5.1.4.3.2. The demand can also be addressed by altering the usage patterns such as instructing the business to run the job during non- peak hours.

1.5.1.4.4. The demand management instructions are tested to check for the accuracy and the effectiveness. Testing is preferably done on a controlled test environment to avoid impact to the business.

1.5.1.5. Document and test the backup instruction:

1.5.1.5.1. Back up appropriate data and configurations prior to the implementing tuning and demand management instructions to avoid any impact on failure. Identify the data that needs to be backed by determining the impacted areas.

1.5.1.5.2. Test the backup instructions to check for the accuracy and the effectiveness. Testing must be done on a controlled test environment to avoid impact to the business.

1.5.1.6. Document and test the rollback instructions:

1.5.1.6.1. Document the rollback instructions to restore the services to normal condition when there is a failure in optimization. Possible failures includes:

1.5.1.6.1.1. Implementation does not meet the optimization objective.

1.5.1.6.1.2. Implementation could not be completed within the stipulated time.

1.5.1.6.2. Restore the backed-up data to roll back to normal state. Test the rollback instructions to check for accuracy and the effectiveness. Testing must be done on a controlled test environment to avoid impact to the business.

1.5.1.7. Identify & document additional Monitoring parameters and thresholds:

1.5.1.7.1. Analyze the tuning instructions and determine the list of parameters that needs to be monitored. Determine the threshold limits for the identified parameters.

1.5.1.8. Update Capacity Plan:

1.5.1.8.1. The Capacity Plan is updated with the tuning instructions and monitoring parameters and thresholds.

1.5.1.8.2. The capacity estimation can be maintained & updated to consolidate and track the optimization recommendation for initiating the request for change as needed.

1.5.1.8.3. The Capacity Plan is implemented through change management.

1.5.1.8.4. The Tuning, configuration of the monitoring parameters and threshold limits needs to be implemented in a controlled manner. Proceed to Capacity Implementation to smooth functioning

1.6. Demand Management

1.6.1. The Demand Management ensures optimal use of the resource and in turn results in cost reduction:

1.6.1.1. Determine the demand & health of resource sub-components.

1.6.1.1.1. The demand for each identified resource and services are determined by analyzing the predicted utilization. For each resource and service where the demand is high, the working conditions of the sub-components are

assessed. The sub-components determine the performance of the services and resources. For example, the memory, processor, hard disk and network card determines the performance of the resource.

1.6.1.1.2. The capacity assessment Report is referred to identify the list of services and resources that need to be optimized. The assessment report contains details of assessment such as demand assessment & estimation, usage analysis, availability analysis, and analysis of SLA breaches.

1.6.1.2. Identify the services provided by the resource & their priority and schedule.

1.6.1.2.1. A resource can provide more than one service with different priorities across different timelines. To manage the demand for the resources and the services effectively it is necessary to understand:

1.6.1.2.1.1. Different services provided by the resource.

1.6.1.2.1.2. Business Priority of each service.

1.6.1.2.1.3. The schedule at which each service is run.

1.6.1.2.1.4. The dependency between services.

1.6.1.3. Health of any component affected :

1.6.1.3.1. The working conditions of the resource sub-components are assessed to identify the affected sub-components.

1.6.1.3.2. If the health of the sub-component is affected, then proceed to “4.6.1.4 – Component handles partial load”, else proceed to “4.6.1.6 – Component acquisition or upgrade required”.

1.6.1.4. Component can handle partial load:

1.6.1.4.1. The affected sub-component is assessed to check whether it can handle the partial load.

1.6.1.4.2. If the component can handle partial load, proceed to “4.6.1.Handle Partial Load**.** – Document the instructions for handling partial load” else proceed to “4.6.1.6– Component acquisition or upgrade required”.

1.6.1.5. Document the instructions for handling partial load:

1.6.1.5.1. When the affected sub-component is capable of managing partial load, it is necessary to determine which service should be run at what time and which service should be stopped at what time.

1.6.1.5.2. The following criteria need to be considered to reduce the load on the affected sub-component:

1.6.1.5.2.1. The business priority of the service.

1.6.1.5.2.2. Physical requirements of the service.

1.6.1.5.2.3. The schedule of each service.

1.6.1.5.3. The requirement of the services and the risk of stopping the services are analyzed to determine the impact on the business.

1.6.1.5.4. The procedures to start and stop the services are documented.

1.6.1.5.5. Proceed to the activity which initiated the demand management (step 4.6.1.1).

1.6.1.6. Component acquisition or upgrade required:

1.6.1.6.1. Analyze the demand for the resource and the capacity of the resources to determine whether the existing resource can be further optimized.

1.6.1.6.2. If it is not possible to optimize the existing resource, then verify the unused stock to identify the appropriate match.

1.6.1.6.3. If the demand of the resource cannot be managed, then proceed to "4.6.1.7– Cost justifiable to acquire or upgrade", else proceed to "4.6.1.9– Identify & document the use of physical or financial constraints".

1.6.1.7. Cost justifiable to acquire or upgrade:

1.6.1.7.1. Compare the approximate cost for the required upgrade or the new resource against the allocated budget.

1.6.1.7.2. If it is possible to justify the cost of the upgrade then proceed to "4.6.1.8– Document details of resource requirement", else proceed to "4.6.1.9– Identify & document the use of physical or financial constraints".

1.6.1.8. Document details of resource requirement:

1.6.1.8.1. Predict the current and future workload details of the resource to determine the configuration details for the upgrade or new resources.

1.6.1.9. Identify & document the use of physical or financial constraints:

1.6.1.9.1. Identify the possibilities of managing the demand for a resource by use of physical or financial constraints when it is difficult to cost justify an expensive upgrade.

1.6.1.9.2. Demand for a resource can be managed by using physical constraints such as:

1.6.1.9.2.1. Stopping services at certain times.

1.6.1.9.2.2. Limiting access to services for certain set of users.

1.6.1.9.2.3. Limiting the number of concurrent connections to the service.

1.6.1.9.2.4. Configuring timeout.

1.6.1.9.3. Influencing the demand can also be exercised by financial constraints such as offering reduced rates for using the service during non-peak hours.

1.6.1.9.4. Prior to implementing these physical or financial constraints, it has to be discussed and agreed with the client. Capacity manager may seek the help form Remote Service Coordinator (RSC), Account managers to influence client decisions. Even though the required budget to upgrade the resources may not have been allocated, it may be necessary still to go ahead with procurement to avoid SLA breaches.

1.7. Modeling

1.7.1. The objective of Modeling is to predict the behavior of the IT Services and resources under a given volume and a variety of work:

1.7.1.1. Gather and analyze workload:

1.7.1.1.1. Workload details are analyzed to identify the pattern of usage and to define or make modifications on the baselines.

1.7.1.1.2. Baseline is a snapshot that is used as a reference for comparing the current state against it.

1.7.1.2. Perform trend analysis:

1.7.1.2.1. Trend analysis is done to predict the behavior of services and resources under given volume of work.

1.7.1.2.2. The service and resource utilization data are used for analyzing the trend over a period of time and how it is expected to change in the future. Spread sheets or automated tools can be used to populate and analyze the trend in the utilization data.

1.7.1.2.3. Trend analysis provides only estimates and does not give accurate prediction.

1.7.1.3. Additional analysis required:

1.7.1.3.1. Additional analysis is required to provide estimations with better accuracy.

1.7.1.3.2. When the estimations made from the trend analysis is not satisfactory, decision on additional analysis requirement is made.

1.7.1.3.3. If additional analysis is required, then proceed to "4.7.1.4– Type of Modeling required", else proceed to "4.7.1.6– Run "What-If" prediction when needed".

1.7.1.4. Type of modeling required:

1.7.1.4.1. The cost, time, and accuracy factors determine the type of modeling for further analysis.

1.7.1.4.2. If the required modeling type is Analytical, then proceed to "4.7.1.5 – Perform Analytical modeling", else if the type is what-if prediction, then proceed to "4.7.1.6– Run what-if prediction when needed".

1.7.1.5. Perform analytical modeling:

1.7.1.5.1. Analytical modeling is done to predict the resource utilization and service performance with better accuracy than trend analysis.

1.7.1.5.2. The utilization data and performance data are collected and relevant mathematical techniques e.g. queuing theory is applied for predicting the resource usage and service performance.

1.7.1.5.3. Analytical models are cost-effective and requires less time when compared to simulation modeling.

1.7.1.5.4. Proceed to "4.7.1.7 – Compile recommendation".

1.7.1.6. Run "What-If" prediction or simulation when needed:

1.7.1.6.1. Perform analysis to ascertain the estimations made from the above prediction techniques.

1.7.1.7. Compile recommendation:

1.7.1.7.1. Estimations of Resource utilization and Service performance made from different prediction techniques are compiled for estimating the required Capacity.

1.7.1.7.2. Proceed to activity which initiated modeling.

Responsibilities

The responsibility for implementing this procedure lies with the following personnel:

- Capacity Manager – Group Leads across various teams:

  Capacity manager is responsible for the overall execution of capacity management process. He is also responsible for the following activities:

  - Determine the capacity management objectives.
  - Act as an escalation point for the capacity related issues.
  - Review and approve the capacity model.
  - Provide the Stakeholders with the capacity updates.
  - Supervise the Capacity Management Process.
  - Provision adequate Capacity to satisfy the business requirements.
  - Optimize resource utilization in a cost-effective manner.
  - Drive continuous improvement of the process.
  - Monitor the adherence to the Service Levels.
  - Coordinate the cross-functional team activities.
  - Prepare and update the Capacity Plan.
  - Participate on the Change Advisory Board (CAB), assessing, and authorizing the Changes.
  - Assess the Service Level Requirements (SLR) for its achievability and providing recommendation for negotiation.
  - Assist in the creation and review of Service Level Agreement (SLA).
  - Provide reports updates which include current usage of resources, trends and forecasts.
  - Coordinate with all capacity management stakeholders (ISD, application support and development, Architecture and Business Support) to ensure their involvement in the process.

- Capacity Analyst – Identified Members in respective teams at IT team.

  Capacity Analysts supports the Capacity Manager from an infrastructure perspective by executing the following activities:

  - Ensure that the appropriate levels are set for the monitoring of service, resource capacity, and the system performance.
  - Ensure that the information recorded in a CDB is up to date.
  - Size the proposed systems and changes to existing systems to determine the IT resources required, hardware utilization, performance service levels, and cost implications.
  - Assess the new technology and its relevance to the organization in terms of performance and cost.
  - Analyze the Service Level Requirements (SLR) for its achievability and providing recommendation for negotiation.
  - Make recommendations on the design and use of systems to ensure the optimum use of all hardware and software resources.
  - Identify the opportunities for cost reduction by capacity consolidation.
  - Recommend resolutions for performance or capacity related incidents and problems.

- Work with customers to translate the business capacity requirements into service and resource capacity requirements.
- Participate in solutions design and identifying the right-size components for new business requirements and development.
- Initiate and monitor the capacity related change request to ensure the timely availability of adequate capacity.
- Assist in the preparation of capacity Plan in line with organization business requirement.
- Suggest to IT management when to employ demand management, to influence the customer demands on systems.
- Monitor the resource utilization and service performance.
- Ensure recording of the utilization data in the CDB. (Capacity Data Base).
- Initiate the resolution procedures for any threshold breaches.
- Follow the escalation matrix & escalate to relevant stakeholders upon the threshold breaches.
- Identify the areas for improvement based on the monitoring.
- Notify the opportunities for the effective use of capacity.
- Notify the enhancement requirements to the existing systems.
- Report on the performance against targets specified in SLAs.
- Furnish the artifacts and supporting facts during capacity management process audits.

- Tenants
  - The tenants support the capacity manager by informing them on the foreseen technology changes and providing input regarding the impact on capacity management activities. They provide input on the growth of application capacity (i.e. # of users) for operational applications and upcoming changes.
- Shared T&O
  - T&O is responsible for executing of the procurement request from the capacity manager.
  - Business support provides information to the IT Team on the business direction that may have an impact on capacity management. Organizational changes, organization growth are of this type of input.

Enforcement:

- This policy and procedure is applicable for all the employees and contractors of the company who have access to and use the information assets and IT assets as listed in the Information Asset Classification sheet which have been created for all the departments. Any violation shall be dealt in accordance with the disciplinary action process as laid down in the Code of Conduct.
- Management's interpretation of the clauses in this procedure shall be final and binding. Management reserves the rights to alter or amend any clause in this document at any time as per its discretion.

Metrics

- Metrics shall be reported once every quarter to Head IT.
- Metrics shall be measured by IT teams.
- The metrics to be measured are as provided under, but not restricted to:
    - Number of defined thresholds breached.
    - Number of times estimated capacities failed.
    - Number of business disruptions due to inadequate capacities with the downtime.
    - Excess capacity per group.
    - Planned capacities not implemented.
    - Number of times there was disruptions to the business on account of inadequate capacity.
    - Number of Business hours lost / financial loss on account of capacity inadequacy.
    - List of IT resources which are monitored for capacities.
    - Average Bandwidth usage per user.
    - Number of complaints by user groups on account of very slow network response.
    - Number of user complaints un-attended or unresolved.
    - Bandwidth allocation per application.
    - Number of users per application to the bandwidth provided.
    - Growth in the number of users per application.
    - Application usage time and bandwidth usage.
    - Number of reports run during peak hours i.e., 9.00 AM to 5.00 PM and those run off-peak hours.
    - Bandwidth consumed for net surfing to bandwidth consumed for business applications.

Exceptions

- Exceptions shall not be universal but shall be agreed on a case-by-case basis, upon official request made by the information owner. These may arise, for example, because of local circumstances, conditions or legal reasons existing at any point of time.
- Exceptions to the Personnel Security Policy and Procedures shall be allowed at the time of implementation of this policy and procedures or at the time of making any updating to this document or after implementation on an ad-hoc basis as per business or a specific and a peculiar manifestation of circumstances which could be of temporary or permanent in nature.

- All exception requests shall be submitted by respective HODs/ Security In-charges. These shall be submitted through an Exception Form and sign-off on the same shall be maintained by the requester.

- The Security In-Charge shall review all exceptions, as the case may be, every year for validity and continuity.

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References

- Controls: A.5.6, A.5.22 A.5.37, A.8.24