## **Evaluating Performance and Reliability of a Cloud Kitchen ICT System**

**Scope of the System:**

The Cloud Kitchen ICT system encompasses all hardware and software components that support the daily operations of the kitchen. This includes:

* **Hardware:** Servers, network devices (routers, switches), workstations, tablets for order processing, kitchen displays, temperature sensors, and any other equipment relying on the network.
* **Software:** Operating systems on servers and workstations, kitchen management software, order processing applications, point-of-sale (POS) system, inventory management software, and any other software critical to operations.

**Performance Evaluation and Reliability for Hardware and Software:**

1. **Performance Evaluation:**
   1. **Hardware:** Monitor CPU usage, memory utilization, disk access speed, network bandwidth utilization, and temperature readings to identify potential bottlenecks.
   2. **Software:** Assess application response times, system uptime, error logs for application crashes, and user feedback on slowdowns.
2. **Reliability Evaluation:**
   1. **Hardware:** Analyze system logs for hardware failures, assess redundancy measures (e.g., RAID configurations) in place, and consider historical maintenance records.
   2. **Software:** Monitor system uptime, software crashes, bug reports, and perform regular backups to ensure data integrity in case of software failures.
3. **Scalability**
   1. To determine feasibility for future expansion
4. **Identify performance bottlenecks**
   1. Memory subsystem harddisk system, as you add more users and your cpu gets faster you still don't get the performance increase you are expecting. These subsystems create a bottleneck and musts be addressed
5. **Tuning parameters / system tuning**
   1. Eg: file transfer limits, file size limits etc.

You should find the optimal operational parameters. And it's not always possible to guess, you have to try several combinations before you decide which is best.

**Performance Indicators:**

* **Hardware:** CPU utilization (shouldn't exceed 80%), memory utilization (shouldn't exceed 70%), disk access speed (avoid high wait times), network bandwidth usage (ensure adequate capacity for peak hours), temperature readings (within acceptable range).
* **Software:** Application response times (meeting user expectations), system uptime (minimal downtime), error logs (minimal critical errors), and user feedback on performance.

# What needs to be done

1. Select appropriate evaluation techniques, performance metrics, system workloads and so on
2. Conduct performance measurements correctly
   1. Run experiments, collect data

Once metrics are gathered, then we can proceed with a statistical analysis.

1. Use statistical techniques to compare alternatives
   1. In the end the system should be statistically / “definitely” good.
2. Design simulation / measure experiments
   1. To get maximum results with least effort eg: what are the factors that affect the systems performance etc.
   2. Run simulations for a specified period of time, and vary several parameters.

## 

**Accessing and Organizing Required Resources:**

* **Organizational Procedures:** Refer to existing documentation on change management processes, system evaluation procedures, and capacity planning guidelines.
* **Stakeholder Involvement:** Engage with kitchen staff, managers, and IT personnel to understand their needs and concerns regarding the ICT system.
* **Industry Standards:** Research best practices for cloud kitchen technology infrastructure and software functionalities.
* **Helpdesk and Maintenance Practices:** Collaborate with the IT helpdesk and maintenance team to access system logs and historical maintenance records.

**Evaluating System Performance and Recording Status:**

* Utilize system monitoring tools for hardware and software performance metrics.
* Collect data over a specific period to ensure a representative sample.
* Document observations, identify any performance bottlenecks or reliability issues.

**Observing and Recording Effects of Changes:**

* Implement changes to the system based on evaluation findings (e.g., hardware upgrades, software updates).
* Monitor performance and reliability after implementing changes to assess their effectiveness.

**Documenting and Reporting on Results:**

* Create a comprehensive report summarizing:
  + System performance metrics (hardware and software).
  + Identified bottlenecks and reliability concerns.
  + Actions taken to address performance and reliability issues.
  + Recommendations for future improvements.
* Share the report with relevant stakeholders (kitchen staff, managers, IT) for transparency and collaborative improvement.

**12. Backup and Recovery Policies**

**12.1. Backup Procedures:** Supplier shall implement backup procedures for critical data stored on the hardware supplied to Customer's computer classroom/lab. This includes but is not limited to, user data, system configurations, and essential software.

**12.2. Backup Frequency:** Backups shall be performed on a regular basis, with a frequency of at least [Specify Frequency], ensuring that recent data can be restored in the event of data loss or system failure.

**12.3. Backup Storage:** Backup data shall be stored securely and off-site to prevent loss due to on-site disasters or hardware failures. Supplier shall ensure that backup storage facilities comply with industry standards for data security and integrity.

**12.4. Recovery Procedures:** In the event of data loss or system failure, Supplier shall promptly initiate recovery procedures to restore data and functionality to the hardware. This includes but is not limited to, reinstallation of operating systems, software, and restoration of user data from backups.

**12.5. Recovery Time Objective (RTO):** Supplier shall establish a Recovery Time Objective (RTO) specifying the maximum acceptable downtime for hardware and data recovery. The RTO for critical systems shall be documented in Exhibit D.

**12.6. Recovery Point Objective (RPO):** Supplier shall establish a Recovery Point Objective (RPO) specifying the maximum acceptable data loss in the event of a failure. The RPO for critical systems shall be documented in Exhibit D.

**12.7. Testing and Validation:** Supplier shall periodically test backup and recovery procedures to ensure their effectiveness and reliability. Testing results and any necessary adjustments to the procedures shall be documented and shared with Customer.

**12.8. Backup and Recovery Support:** Supplier shall provide technical support and assistance to Customer for backup and recovery operations, including guidance on data restoration and recovery strategies.

**12.9. Backup and Recovery Documentation:** Supplier shall maintain comprehensive documentation of backup and recovery procedures, including step-by-step instructions for initiating backups, performing restores, and troubleshooting common issues. This documentation shall be made available to Customer upon request.