## **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.

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**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.

**Backup and Recovery Policies**

* **Backup Strategy:**
  + Define the types of data to be backed up (system state, application data, user data).
  + Establish a backup schedule (e.g., daily, hourly) based on criticality of data.
  + Choose an appropriate backup method (full, incremental, differential) considering storage requirements and recovery time objectives (RTO).
  + Select secure backup storage locations (on-site, off-site, cloud).
* **Recovery Procedures:**
  + Document detailed steps for restoring failed hardware, software, or data.
  + Regularly test recovery procedures to ensure effectiveness.
  + Establish a recovery time objective (RTO) – the maximum tolerable downtime after a disaster.
  + Define a recovery point objective (RPO) – the acceptable amount of data loss in the event of a failure.