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Question No. 2

(a) Need for implementing ERP: **04**

Following points depicts the need for implementing an ERP system by BORSH incorporations:

- ERP helps process automation.
- Less errors and increase efficiency
- Better communication, higher productivity.
- Better information and process management
- Integrate all processes/ modules.

ERP Modules:

(i) Material management/ Operation and logistic: inventory management, MRP, production planning, quality management ,shipping

(ii) Financials/ Finance and controlling: accounts receivable and payable, cash management, general ledger, profitability analysis.

(iii) Sales and marketing/distribution: order management, sales management, pricing, sales planning

(iv) Human resources: Employee time accounting, payroll, travel expenses.

(b) Why SAP-ERP is deployed among other Products **04**

SAP allows customizing the software to specific needs of the company.

- It is user-friendly, familiar looking, and has an experience of windows based applications. SAP can be used worldwide
- It is easy to process user transactions with SAP
- SAP improves upon the business process efficiencies
- SAP gives reliable, accurate, and instant information
- SAP is a affordable and no special software is required to access
- SAP supports all the fields, such as Marketing, Finance, Human Resource, Logistics, Operations, etc.

(c) Change Management process: [Any six] **06**

The procedure associated with this migration process ensure that:

- System, operations and programs documentation are complete, up to date and in compliance with the established standards.
- Job preparation, scheduling and operating instructions have been established.
- System and program test results have been reviewed and approved by user and project management.
- Data file conversion, if necessary, has occurred accurately.
- System conversion has occurred accurately and completely as evidenced by review and approval by user management.
- All aspects of jobs turned over have been tested, reviewed and approved by control/ operations personnel.
- The risks of adversely affecting the business operation are reviewed.
- Rollback plan is developed to back out the changes, if necessary.

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(d) Employee Appraisal HRM Policies: **06**

Following policies develop by HR to evaluate employees.

(1) Employee Handbook:

Employee handbooks distributed to all employee at time of hire should explain items such as:

- Security policies and procedures
- Acceptable and unacceptable conduct
- Organizational values and ethics code
- Company expectations
- Vacation policies
- Outside employment
- Performance evaluations
- Emergency procedures
- Disciplinary actions for excessive absence breach of security and non-compliance with policies.

(2) Promotion Policies:

Promotion policies should be fair and equitable and understood by employees. Policies should be based on objective criteria and consider an individual's performance, education, experience and level of responsibility.

(3) Training:

Training should be provided on a regular basis to all employees based on the area where employee expertise is lacking.

(4) Scheduling and Time reporting:

Proper scheduling provides for more efficient operation and use of computing resources. Time reporting allows management to monitor the scheduling process. Management can then determine whether staffing is adequate and if the operation is running efficiently.

(5) Employee Performance Evaluations:

HR department should ensure that IS manager and employees set mutually agreed on goals and expected results. Salary increments, performance bonuses and promotions should be based on performance. The same process can also allow the organization to gauge employee aspirations and satisfaction, and identify problems.

(6) Required Vacations:

A required vacation ensures that once a year, at a minimum, someone other than the regular employee will perform a job function. Job rotation provides an additional control.

(7) Termination policy:

Written termination policies should be established to provide clearly defined steps for employee separation. It is important that policies be structured to provide adequate protection for the organization's computer assets and data.

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(e) Role of Database Administrator: [Any four] **04**

- Specifying the physical data definition.
- Custodian of organization's data, defines and maintains the data structures in the corporate organizations data.
- Changing the physical data definition to improve performance
- Selecting and implementing database optimization tools
- Testing and evaluating programmer and optimization tools.
- Answering database queries to users and programmers.
- Implementing database definition controls, access controls, update controls and concurrency controls.
- Monitoring database usage, collecting performance statistics and tuning the database.
- Defining and initiating backup and recovery procedures.

(f) Offsite Library Controls: [Any six] **06**

Controls over the offsite storage library include:

- Securing physical access to library contents, ensuring that only authorized personnel have access to the library and the offline media.
- Ensuring that physical construction can withstand fire/heat/water
- Locating the library away from the data center, to avoid the risk of a disaster affecting both facilities.
- Ensuring that an inventory of all storage media and files stored in the library is maintained for the specified retention time.
- Ensuring that a record of all storage media and files moved into and out of the library is maintained for the specified retention /expiration time.
- Ensuring that a catalog of information regarding the versions and location of data files is maintained for the specified retention time and protecting this catalog against unauthorized disclosure.

Question No. 3

(a) Phases of Audit Methodology: **08**

(i) **Audit Subject**: Identify the area to be audited.

(ii) **Audit objective**: Identify the purpose of the audit. For example an objective might be to determine whether program source code changes occur in well-defined and controlled environment.

(iii) **Audit scope**: Identify the specific systems, functions or unit of the organization to be included in the review.

(iv) **Pre audit Planning**:

- Technical skills and resources needed.
- Identify the sources of information for test or review such as functional flow charts, policies, standards, procedures and prior audit work papers.
- Identify locations or facilities to be audited.

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(v) **Audit procedures and steps for data gathering**:

- Identify and select the audit approach to verify and test the controls.
- Identify a list of individuals to interview.
- Identify and obtain departmental policies, standards and guidelines for review.
- Develop audit tools and methodology to test and verify control.

(vi) **Procedures for evaluating the test or review results:**

- Organization-specific.

(vii) **Procedures for communication with management:**

- Organization-specific.

(viii) **Audit report preparation**:

- Identify follow-up review procedures.
- Identify procedures to evaluate/ test operational efficiency and effectiveness.
- Identify procedure to test controls.
- Review and evaluate the soundness of documents, policies and procedures.

(b) Payment Systems: [Any three] **07**

The top payment methods used in Pakistan are:

- **Cash on Delivery:** is the most commonly used payment method in Pakistan. As per estimates, more than 95% of e-commerce users in Pakistan prefer cash on delivery (COD) payment model.
- **Bank/ Wire Transfer:** Very few e-commerce businesses operate on the system of only delivering the product after receiving the amount through a wire/bank transfer.
- **Easy Paisa/ Mobi Cash:** Some e-commerce websites also prefer these payment models for transferring small amounts.
- **Credit Card:** Most of the e-commerce websites in Pakistan have merchant accounts integrated on portals to facilitate credit card transactions. However, almost all such e-commerce websites also offer multiple other payment methods and cater to the cash on delivery system.

Question No. 4

(a)

- **Multiprotocol Label Switching (MPLS):** **06**

  MPLS provides a mechanism for engineering network traffic patterns that is independent of routing table. It used internet for transporting data. It assigns short labels to network packets that describe how to forward them through the network.

  Multiprotocol Label Switching (MPLS) is a type of data-carrying technique for high-performance telecommunications networks. MPLS directs data from one network node to the next based on short path labels rather than long network addresses, avoiding complex lookups in a routing table.

- **Digital Subscriber Line (DSL):**

  It provides service using modem technology over existing telephone lines to transport high-bandwidth such as multimedia, video along with voice. A digital subscriber line (DSL) modem is a device used to connect a computer or router to a telephone line which provides the digital subscriber line service for connectivity to the Internet, which is often called DSL broadband.

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- **Virtual Private Networks (VPN):**

  It extends the corporate network securely via encrypted packets send out via virtual connections over the public internet to distant locations, rather than using expensive dedicated leased lines. It is platform independent. Any computer system that is configured to run on an IP network can be connected through a VPN through its software.

- **Point-to-Point Protocol (PPP):**

  It works on data link layer, provides a single pre-established WAN communication path from the customer premises to remote network, usually reached through a carrier network such as a telephone company. In computer networking, Point-to-Point Protocol (PPP) is a data link (layer 2) protocol used to establish a direct connection between two nodes.

(b) Recovery Alternatives: [Any four] **08**

(1) **Cold sites:** are facilities with the space and basic infrastructure adequate to support resumption of operations, but lacking any IT or communications equipments, programs, data or office support. A plan that specifies that a cold site will be utilised must also include provision to acquire and install the requisite hardware, software, and office equipment to support the critical applications when the plan is activated.

(2) **Mobile sites**: are packaged, modular processing facilities mounted on transportable vehicles and kept ready to be delivered and setup at a location that may be specified upon activation. A plan to utilize mobile processing must specify the site locations that may be used.

(3) **Warm sites**: are facilities with space and basic infrastructure, and some or all the required IT and communications equipment installed. The equipments may be less capable then the normal production equipment yet still be adequate to sustain critical applications on an interim basis.

(4) **Reciprocal agreements**: are agreements between separate but similar, companies to temporarily share their IT facilities in the event that one company loses processing capability. These are not viable option in many cases due to constraining burden of maintaining hardware and software compatibility between the companies, the complications of maintaining security and privacy compliance during share operations. In this agreement participants promise to provide assistance to each other when an emergency arises.

(5) **Hot sites**: are facilities with space and basic infrastructure and all of the IT and communications equipments required to support the critical applications, along with office furniture and equipment for use by the staff .Hot sites usually maintain installed versions of the programs required to support critical applications. The most recent backup copies of data would need to be loaded before critical applications could be resumed. Some staff available, employee usually transferred to the hot site from primary site to support operations upon activation.

(6) **Mirrored sites**: are fully redundant sites with real-time data replication from the production site. They are fully equipped and staffed, and can assume critical processing with no interruption noticeable by the users.

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Question No. 5

(a) Auditing Environmental controls: [Any seven] **07**

(i) **Water and smoke detectors:**

The computer room should be visited for visual verification of the presence of water and smoke detectors. Proper placement of these detectors to give early warning of presence of any smoke and water to avoid any cause of mishap to the system.

(ii) **Handheld fire extinguishers**:

It should be in strategic highly visible locations throughout the facility with proper type and should be inspected regularly/annually.

(iii) **Regular inspection by fire department**:

Ensure that local fire department inspector or insurance evaluator/HSE department has been recently inspect the facility. If so, a copy of the report short be obtained, and how to address the noted deficiencies should be determined.

(iv) **Fireproof walls, floors and ceiling of the computer room**:

With the assistance of building management, the documentation that identifies the fire rating of the walls, floors and ceilings as per standard. These walls should have at least a 2 hour fire resistance rating.

(v) **Electrical surge protectors**:

The presence of electrical surge protectors on sensitive and expensive computer equipment should be visually observed by auditor.

(vi) **Power lead from two substations**:

With the assistance of building management documentations concerning the use and placement of redundant power lines into the IPF should be located.

(vii) **Fully documented and tested business continuity plan**:

Ensure and check BCP /DRP exist.

(viii) **Wiring placed in electrical panels and conduit**:

Wiring in the IPF should be placed in fire-resistant panels and conduit.

(ix) **UPS/Generator**:

The most recent test should be determined and the test reports should be reviewed. Emergency power-off switch (EPO) should be exist in UPS/Generator in order to immediately shut off power in case of any fire or any other disaster.

(x) **Documented and tested emergency evacuation plans** :

A copy of emergency evacuation plan with drill details should be evaluated by auditor, which describes how to leave the IPFs in an organized manner that does not leave the facilities physically insecure. Emergency evacuation plan should be posted throughout the facility.

(xi) **Humidity /Temperature control**:

The facility should be visited on regular intervals to determine whether temperature and humidity are adequate. These parameter logs can monitor on environmental/building management system software.

(xii) **Fire suppression system**:

Proper fire suppression system should be installed in facility. IS auditors may need to limit their tests to reviewing documentation to ensure that the system has been inspected and tested regularly as per industry standard.

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(b) Different phases of System Development Life Cycle (SDLC): 08

SDLC Phase	General Description
Phase-1 – Feasibility Study:	Determine the strategic benefits of implementing tile system either in productivity gains or in future cost avoidance identify and quantify the cost savings of a new system, and estimate a payback schedule for costs incurred in implementing the system. Further, intangible factors such as readiness of tile business users and maturity of the business processes will also be considered and assessed. This business case provides the justification for proceeding to the next phase.
Phase-2 – Requirements Definition	Define the problem or need that requires resolution and define the functional and quality requirements of the solution system. This can be either a customized approach or vendor-supplied software package, which would entail following a defined and documented acquisition process. In either case, the user needs to be actively involved.
Phase-3A – Software Selection and Acquisition (purchased systems)	Based on the requirements defined, prepare an RFP from suppliers of purchased systems. In addition to the functionality requirements, there will be operational, support and technical requirements, and these, together with considerations of tile suppliers' financial viability and provision for escrow, will be used to select the purchased system that best meets the organization's total requirements.
Phase-3B – Design (in-house development)	Based on the requirements defined, establish a baseline of system and subsystem specifications that describe tile parts or the system, how they interface, and how the system will be implemented using the chosen hardware, software and network facilities. Generally, the design also includes program and database specifications, and will address any security considerations. Additionally, a formal change control process is established to prevent uncontrolled entry of new requirements into the development process.
Phase-4A – Development (in-house development)	Use the design specifications to begin programming and formalizing supporting operational processes of the system. Various levels of testing also occur in this phase to verify and validate what has been developed. This would generally include all unit and system testing, as well as several iterations of user acceptance testing.
Phase-4B – Configuration (purchased systems)	Configure the system, if it is a packaged system, to tailor it to the organization's requirements. This is best done through the configuration of system control parameters, rather than changing program code. Modern software packages are extremely flexible, making it possible for one package to suit many organizations simply by switching functionality on or off and setting parameters in tables. There may be a need to build interlace programs that will connect the acquired system with existing programs and databases.
Phase-5 – Final Testing and Implementation	Establish the actual operation of the new information system, with the final iteration of user acceptance testing and user sign-off conducted in this phase. The system also may go through a certification and accreditation process to assess the effectiveness of the business application in mitigating risks to an appropriate level and providing management accountability over the effectiveness of the system in meeting its intended objectives and in establishing an appropriate level of internal control.

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SDLC Phase	General Description
Phase-6 – Postimplementation	Following the successful implementation of a new or extensively modified system, implement a formal process that assesses the adequacy of the system and projected cost-benefit or ROI measurements i.e, the feasibility stage findings and deviations. In so doing, IS project and end-user management can provide lessons learned and/ or plans for addressing system deficiencies as well as recommendations for future projects regarding system development and project management processes followed.

(c) Management of IS Operations: **06**

Management control functions include the following:

(i) **IS Management**:

- Ensuring that adequate resources are allocated to support IT operations.
- Planning to ensure the efficient and effective use of an operation's resources.
- Authorizing and monitoring IT resources usage based on corporate policy.
- Monitoring operations to ensure compliance with standards.

(ii) **IS Operations**:

- Ensuring that detailed schedules exist for each operating shift
- Reviewing and authorizing changes to the operations schedules.
- Reviewing and authorizing changes to the network, system and applications.
- Ensuring that changes to hardware and software do not create disruption to normal processing.
- Monitoring system performance and resource usage
- Monitoring service level agreements.
- Anticipating equipments replacement and ensure scalability.
- Maintaining job accounting reports and audit records
- Review logs to detect critical system events and establish accountability accordingly.
- Ensure that all problems and incidents are handled timely and properly.
- Ensure IS processing can recover in a timely manner from minor and major disruptions of operations.

(iii) **Information Security**:

- Ensuring the confidentiality, integrity and availability of the data
- Monitoring the environment and security of the facility to maintain proper conditions for equipment performance
- Ensuring that security vulnerabilities are identified and resolved timely.
- Ensuring security patches are identified and installed timely.
- Detecting intrusion attempts
- Resolving information security events, incidents and problems in a timely manner.
- Limiting logical and physical access to computer resources to those who require and are authorized to use it.

THE END

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