IT WEEK 1

Questions

1.Explain ITIL? Describe the various processes involved in ITIL?
2.Explain infrastructure design document ?
3.List and briefly describe about any four categories of IT infrastructure.
4.What are the important challenges of managing IT infrastructure ?

Answers

1.Explain ITIL? Describe the various processes involved in ITIL?

ITIL, or Information Technology Infrastructure Library, is a well-known set of IT best practices designed to assist businesses in aligning their IT services with customer and business needs. Services include IT-related assets, accessibility, and resources that deliver value and benefits to customers.

In the early days of enterprise IT, the information technology department was viewed as a cost centre within the business. Communication and collaboration between the IT department and the business was poor, and many organizations lacked any formalized processes for requesting services or reporting IT incidents. As a result, there was a common perception within many organizations that IT did not add much value and did not effectively serve the needs and goals of the business.

As enterprise IT organizations matured, they recognized a growing need to demonstrate their value by catering to the specific needs of the business. IT professionals began practicing IT in a new paradigm known as IT Service Management (ITSM). In the ITSM paradigm, the IT organization is viewed as its own entity and the business unit is the customer. To satisfy its customers, the IT organization provides services that are supported by IT assets and capabilities. These services must align with the strategic requirements of the business and they must be delivered by the IT organization in accordance with agreed service levels.

ITIL V1: The Origin

The ITIL framework was first developed by the Central Computing and Telecommunications Agency (CCTA), a government agency in Great Britain. It was 1986 and the British

government saw that its information technology was getting increasingly costly - there was a need to develop a methodology for IT service management that would enable cost savings and more efficient use of resources. By 1988, the CCTA had published a set of guidelines known as the Government Infrastructure Management Method (GITMM), however the word "government" in the name of the standard was seen to have a negative influence on private-sector adoption. In 1989, the GITMM was re-named the Information Technology Infrastructure Library (ITIL).

ITIL V2: The First Major Evolution

The early late 1990's and early 2000's were a challenging period for ITIL, characterized by changes and growing competition. The International Organization for Standardization (ISO) had released its own ITSM standard in 1995, known as ISO/IEC 20000 and other ITSM standards were beginning to emerge as well. Just in the year 2000, the CCTA merged into Great Britain's Office for Government Commerce (OGC), BSI released the BS 15000:2000 specification for ITSM and Microsoft, using ITIL as inspiration, created their own ITSM framework known as Microsoft Operations Framework (MOF).

To remain relevant in the face of growing competition, the ITIL framework and processes needed to be improved, re-invented, and reorganized into a more structured framework that would become known as ITIL V2. This revision of ITIL allowed OGC to describe new IT concepts like release and deployment management and clearly define processes like ITIL incident management and the financial management of IT assets. Publishing ITIL V2 would also allow for the elimination of duplicate entries that characterized ITIL V1.

The first volume of ITIL v2 was released in 2001. By 2002, seven volumes of ITIL V2 were made available:

1. Service Support
2. Service Delivery
3. ICT Infrastructure Management
4. Security Management
5. Application Management
6. Software Asset Management
7. Planning to Implement Service Management

ITIL V3: Introducing the IT Service lifecycle

By 2007, the OGC had further refined their approach to ITSM and were prepared to release an even more comprehensive and well-organized update to ITIL V2. ITIL V3 was released in

2007 as a set of five publications, each corresponding to an individual stage of the IT service lifecycle. The five books were titled:

1. ITIL Service Strategy
2. ITIL Service Design
3. ITIL Service Transition
4. ITIL Service Operation
5. ITIL Continual Service Improvement

Service Strategy

Service strategy is the first book in ITIL V3 and corresponds to the first stage in the IT service lifecycle. The purpose of service strategy is to align the actions of the IT organization with the needs of the business. To do this, the IT organization must decide on a strategy for effectively serving its customers. As part of Service Strategy, the IT organization works with the business to determine what services the IT organization should offer and what capabilities must be developed.

There are five processes described in the Service Strategy volume of ITIL V3:

1. **Strategy Management for IT Services** - a process that helps the IT organization assess its offerings and capabilities before developing a strategy to serve its customers effectively.
2. **Service Portfolio Management** - a process for managing the service portfolio, which includes services in development, active and available services and retired services.
3. **Financial Management for IT Services** - a process that helps the IT organization manage its budgeting, charging and accounting requirements.
4. **Demand Management** - a process for assessing customer demand for services. A demand manager follows industry trends and communicates with customers to anticipate what services the business might want in the future.
5. **Business Relationship Management** - a process that helps the IT organization maintain good relations with the business by communicating to identify business needs and collecting feedback on IT performance and customer satisfaction.

Service Design

Once the IT organization has decided to develop a new service, the next step is Service Design. The Service Design stage focuses on developing new IT services, as well as modifying or improving existing IT services to enhance their value to the business.

There are eleven processes described in the Service Design volume of ITIL V3:

1. **Design Coordination** - a process for coordinating service design activities with respect to modified or newly implemented IT services.

2. **Service Catalog Management** - a process for establishing and maintaining a catalog of all available services offered by the IT organization.
3. **Service Level Management** - a process for negotiating service level agreements with customers, ensuring that services are adequately designed to deliver services according to the agreements, and ensuring that operational agreements and contracts are effectively negotiated and managed.
4. **Risk Management** - a process for the identification and control of risk within the IT organization. Risk management includes an assessment of IT assets along with their value and potential vulnerability as an attack vector. The risk management process helps IT managers determine how IT assets will be protected and secured.
5. **Capacity Management** - a process for ensuring that the IT organization has allocated sufficient resources towards providing IT services in accordance with service level agreements.
6. **Availability Management** - similar to capacity management, this process contains activities and sub-processes that help define, measure and improve the availability of IT services. Availability management includes testing, monitoring and reporting activities that verify the availability of services and alert IT operators when a service experienced unplanned downtime.
7. **IT Service Continuity Management** - a process for minimizing service downtime and minimizing the impact of disaster events on IT service availability.
8. **Information Security Management** - a process for maintaining the security of data owned by the business, including sensitive customer data, payment data and proprietary business information.
9. **Compliance Management** - a process for ensuring and verifying that the IT organization is effectively complying with internal and external company policies, software license agreements, industry-specific privacy and data security standards, regulations and any adopted standards or best practice frameworks.
10. **Architecture Management** - a process for planning the future development of information technologies and how they will fit into the existing technology stack.
11. **Supplier Management** - a process for establishing and maintaining supplier or vendor relationships that meet the changing needs of the business.

Service Transition

A service that has been designed enters the Service Transition phase where it will be built and deployed onto the organization's IT infrastructure. The purpose of Service Transition is to control the production and deployment of new IT services while ensuring that changes to existing services are effectively coordinated to prevent business disruptions.

There are eight processes described in the Service Transition volume of ITIL V3:

1. **Change Management** - the change management process control changes throughout their entire lifecycle, ensuring that IT organizations can implement changes without disrupting essential services
2. **Change Evaluation** - the change evaluation process is used to assess the impact and success of major changes at key points in the IT service lifecycle: prior to planning, prior to building, prior to deployment, and after deployment.
3. **Project Management (Transition Planning and Support)** - a process for effectively coordinating new service releases in a way that achieves cost, time and quality objectives.
4. **Application Development** - a process for building new applications that meet the needs of the business. The IT organization can build and maintain its own applications or customize an application that was purchased or licensed from a software vendor.
5. **Release & Deployment Management** - a process for planning and scheduling the testing and release of new deployments in a way that protects the live environment and minimizes disruption to services.
6. **Service Validation and Testing** - this process verifies that new services meet the business requirements that they were designed for and that IT operations teams have the tools and information required to support the newly released or modified service.
7. **Service Asset and Configuration Management** - a process for maintaining a configuration management database (CMDB) that contains information about the attributes and inter-dependencies of configuration items (CIs) needed to enable IT service delivery.
8. **Knowledge Management** - a process whose goal is to reduce the need for the IT organization to rediscover knowledge. ITIL Knowledge management supports the gathering, analysis, storage and deployment of knowledge within an organization.

Service Operation

Service Operation is the fourth stage in the IT service lifecycle. Its objective is to ensure that operational IT services are delivered effectively and efficiently for customers. This stage is unique in that it contains both processes and functions. A function performs a specialized task or set of tasks, while a process is a collection of sub-processes that can be performed in a particular sequence to achieve a desired goal.

There are six processes and four functions described in the Service Operation volume of ITIL V3.

The six processes are:

1. **Event Management** - event management deals with the monitoring of available services and configuration items to capture event logs, analyze events and determine whether an event requires any action.
2. **Incident Management** - a process for managing the lifecycle of all IT incidents from when they are reported through to resolution.

3. **Request Fulfillment** - a process that allows users or customers to submit requests to the IT organization for specific services and for the IT organization to fulfill those requests.
4. **Access Management** - access management deals with controls of user authorization for specified systems and applications, ensuring that only authorized users can gain access to restricted systems and helping to maintain security of the IT infrastructure.
5. **Problem Management** - a problem can be described as the root cause of an incident that is observed repeatedly within an organization. This process manages the lifecycle of problems and helps to minimize the impact of incidents that cannot be prevented (known issues that have not yet been resolved).
6. **Facilities Management** - a set of best practices for managing the physical location where the IT infrastructure (data centers, servers, other IT assets) can be found.

The four functions are:

1. **IT Service Desk** - the IT Service Desk functions as a single point of contact between the business and the IT organization. Here, users can report incidents or submit service requests through the organization's ticket logging system. Service desk metrics are meticulously tracked by IT organizations to drive rapid resolution times and prevent service disruptions for the business.
2. **Technical Management** - this function provides technical expertise that supports effective management of the IT infrastructure. An IT organization may employ one or more technical analysts for each key technology area within the organization. Technical analysts are involved in many ITIL processes that span the design, building, testing and deployment of applications and IT services.
3. **Application Management** - this function includes activities such as application design, testing and operation whose goal is to manage applications throughout their lifecycle. An IT organization may employ a single application analyst or a team of application analysts for each critical application that it manages. Analysts conduct day-to-day application management activities while developing the skills needed to deliver IT services using the application.
4. **IT Operations Management** - IT operations management deals with scheduling and oversight of crucial operational activities within the IT department, including workloads, system restoration and backups and other routine maintenance tasks. Daily IT operations tasks will be carried out by an IT operations manager and a team of IT operators.

2.Explain infrastructure design document ?

In this section the following 4 aspects will be discussed.
1. Design Document
2. Content of Design document
3. IT infrastructure design should be able to take care of various tasks
4. Necessary to keep the business of an organization running smoothly.

Design of IT Infrastructure involves the designing the IT design document

- ✓ Design document = complete information about the IT infrastructure
- ✓ Design Document = written documentation of the design factors and the choices to satisfy the business and technical requirements.

  The design documentation also aids in the implementation of the design. In many cases where the design architect is not responsible for the implementation, the design documents ensure the successful implementation of the design by the implementation engineer

The contents of the Design Document

1. Architecture design
2. Implementation plan
3. Installation guide
4. Validation test plan
5. Operational procedures

It documents the criteria that must be met to determine the success of the implementation and the test procedures that should be followed when validating the environment.

Design document contains following major aspects.

1. Design of Data Centre and Server Room
2. Design of IT network
3. Hardware and software specifications (Servers, Desktops and Laptops)
4. Specifications of Server and Client Operating systems
5. Details of access, controls to be implemented to access critical IT assets
6. Internet bandwidth, security devices and applications
7. Email service to be setup
8. Design of backup and disaster recover mechanism.

IT infrastructure design should be able to take care of various tasks necessary to keep the business of an organization running smoothly

3.List and briefly describe about any four categories of IT infrastructure.

IT infrastructure of an organization comprises of Hardware Equipments, Software, and any Other Components required delivering IT services to its customers

Need for the well planned IT infrastructure Management

1. Almost all business activities of an organization highly depend on the infrastructure.

2. A good and reliable IT infrastructure is the key to the successful operations and is the foundation of any viable IT organization.

3. Every organization has to scale its information technology (IT) infrastructure to support business growth, managing global networks, databases and applications becomes an important task.

4. IT infrastructure needs to be developed and managed in an effective manner to support the requirements of the organization.

Major Aspects in IT infrastructure

1. Purchased software (e.g., ERP packages, RDBMS, operating systems, e-mail tools, office tools, financial applications, etc.)

2. IT infrastructure hardware (e.g., machines, desktops, servers, switches, communication devices, etc.)

3. Softwares developed

4. Software maintenance (corrective, perfective, adaptive, preventive)

5. IT services (e.g., software setup, help desk, computer administration, etc.)

6. Human resource (working staff) 1.2.2

Aim of IT Infrastructure Management

IT infrastructure management aims to manage these components for effective utilization in order to provide better services to customers.

Who will perform IT infrastructure Management

This is usually done by IT department of an organization in consultation with “top management”.

How to perform IT infrastructure Management

IT infrastructure management creates an infrastructure management environment that reduces IT complicacies. It automates and supports required performance and service availability levels and resolves problems to ensure the business continuity.

Major Activities involved in IT infrastructure management

Among many other objectives, IT infrastructure management tries to:

1. Decrease the duplication of effort and increase organizational production

2. Decrease business risk

3. Ensure the use of standards

4. Ensure minimum downtime

5. Improve adaptability necessary for a changeable environment

6. Improve the information flow in information system

7. Ensure interoperability among organisational and external entities

8. Maintain effective change management policies and practices

9. Reduce operational costs

10.Increase service quality

11.Increase business planning

The following are the list of activities happening in the broad aspect of IT infrastructure management.

• IT infrastructure management aims to manage these components for effective utilization in order to provide better services to customers.

• Almost all business activities of an organization depend upon the infrastructure. • Hence, its effective management is very essential.

• IT infrastructure needs to be developed and managed in an active manner to support the requirements of the organization.

• This is usually done by IT department of an organization in consultation with top management. • A good and reliable IT infrastructure is the key to the successful operations and is the foundation of any viable IT organization.

• IT infrastructure management creates an infrastructure management environment that reduces IT complicacies.

• It automates and supports required performance and service availability levels and resolves problems to ensure the business continuity.

• As an organization scales its information technology (IT) infrastructure to support business growth, managing global networks, databases and applications becomes an important task

4.What are the important challenges of managing IT infrastructure ?

Few important challenges of managing IT infrastructure :

1. Suitability to the organization

2. Low cost and High Quality

3. Adaptability in Changeable environment

4. Decrease Business Risk

1. Suitability to the organization

• IT infrastructure management needs to develop and deploy management activities in such a way that they support operational and strategic goals of the organization.

• The management activity consists of two parts: Maintenance of existing systems and development of new infrastructure.

• Usually, information system development relies on existing hardware and software resources.

• However, vision is required in both business and IT in order to achieve what technology can do and how to make its best possible use.

2. Low cost and High Quality

• Management activities should achieve low cost with High Quality.

• Sometimes, interactions and partnership with outside IT service providers may provide solutions to this challenge.

3. Adaptability in Changeable environment

• IT infrastructure should not only be reliable in operations today but it should also be open for changes in the future to incorporate future business requirements.

• All choices that are made in developing the infrastructure are important because the infrastructure is an organizational asset and meant to be used for an extended period.

4.Decrease the Business Risk

• Infrastructure provides the foundation upon which business applications are built.

• Therefore, it is required to be managed in such a way that it does not fail under any circumstances. • Since these challenges are related to IT management problems, IT managers should develop management procedures to match the current and future requirements**.**

Why the Role of IT manager is really important?

Since the above challenges are related to IT management problems, IT managers should develop management procedures to match the current and future requirements